

Proximity and Semi-Metric Analysis of Social Networks

Advanced Knowledge Integration In Assessing Terrorist Threats LDRD-DR Network Analysis Component

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*Luis M Rocha*¹

*Modeling, Algorithms, and Informatics Group (CCS-3)
Los Alamos National Laboratory, MS B256*

¹ Eugene Gavrilov and Jim Gattiker participated in the work here described, by producing necessary databases and generating data sets and proximity measures as specified throughout the text.

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1. DATA SETS

We received several data sets for the Network Analysis component. From the document reports stored in the original Lotus Notes database, Eugene Gavrillov created an SQL database for use by the entire project. From the first load of this database, the relation between people names and documents was deemed of interest. We refer to this as the **PEOPLE_DOCUMENTS1** dataset. Another relation between cities and documents was also studied: **CITIES_DOCUMENTS1**.

Later, when new documents and additional relations were added to the Lotus Notes database, Eugene Gavrillov updated the SQL database. From this novel database we again extracted the relation between people names and documents: **PEOPLE_DOCUMENTS2**. We furthermore extracted four additional relations of interest:

1. **EVENTS_GROUPS**: A Relation between terrorist events and terrorist organizations.
2. **EVENTS_PEOPLE**: A Relation between terrorist events and people names.
3. **GROUPS_PEOPLE**: A Relation between terrorist organizations and people names.
4. **PEOPLE_RELATEDPEOPLE**: A Relation between people names and other people names found in the related people field of the database.

2. PROXIMITY RELATIONS

2.1 Mathematical Background

2.1.1 Crisp Relations

“A crisp relation represents the presence or absence of association, interaction or interconnectedness between the elements of two or more sets.” ((Klir & Yuan 1995) page 119). In other words, a relation R between sets X_1, X_2, \dots, X_n is a subset of the Cartesian product of these sets: $R(X_1, X_2, \dots, X_n) \subseteq X_1 \times X_2 \times \dots \times X_n$. Thus, since a relation is itself a set, the traditional logical operations between sets can be used to modify relations. The elements of relations are n -tuples of the universal set $\mathbf{X} = X_1 \times X_2 \times \dots \times X_n$: $\mathbf{x} = (x_1, x_2, \dots, x_n)$. Relations can also be defined by a characteristic function which assigns a value of 1 to every element \mathbf{x} of \mathbf{X} belonging to the relation and a 0 to those elements not belonging to it:

$$R(x_1, x_2, \dots, x_n) = \begin{cases} 1 & \text{iff } (x_1, x_2, \dots, x_n) \in R \\ 0 & \text{otherwise} \end{cases}$$

The membership of \mathbf{x} in R signifies that the elements of \mathbf{x} are related or associated to one another ((Klir & Yuan 1995) page 119). Relations between two, three, four, and five sets are referred to as

binary, ternary, quaternary, and quinary respectively. A relation between n sets is generally referred to as a n -ary relation.

2.1.2 Fuzzy Relations

Naturally crisp relations can be generalized to fuzzy relations by allowing a degree of association between the elements of tuples \mathbf{x} . Thus, a fuzzy relation is a fuzzy set defined on \mathbf{X} .

$$R(\mathbf{x}) \in [0, 1], \quad \forall \mathbf{x} \in \mathbf{X}$$

The value of R represents the degree of association or strength of the relation between the elements of \mathbf{x} .

2.1.3 Binary Relations and Graphs

Binary relations are especially important because they are a generalization of functions, in that binary relations between sets X and Y may associate to each element of X two or more elements of Y , whereas functions can only assign one and only one element of Y to each element of X . Binary fuzzy relations, $R(X, Y)$, can be easily represented by matrices of dimension $n \times m$ where n and m are the number of elements of X and Y respectively.

Binary relations can also be defined on a single set: $R(X, X)$. These relations define degrees of association between elements of the same set, and are referred to as *directed graphs* because they can be easily represented by diagrams where:

- each element of X is uniquely depicted by a single node (or vertice)
- directed connections (or edges) between nodes indicate a non-zero degree of association for pairs of elements of X in the relation
- each such connection is uniquely defined by its particular association value.

2.1.4 Properties of Graphs

In this case, relations are represented by matrices of dimension $n.n$, that is, there are n^2 possible connections between the n elements of the directed graph. In particular, the degrees of association between x_i and $x_j \in X$, $R(x_i, x_j)$ might be different than $R(x_j, x_i)$, hence the direction of associations.

A binary fuzzy relation $R(X, X)$ is *reflexive* iff $R(x, x) = 1$ for all $x \in X$. That is, if every element of X is maximally associated with itself. A binary fuzzy relation $R(X, X)$ is *symmetric* iff $R(x, y) = R(y, x)$ for all $x, y \in X$. That is, if x is associated with y to a degree, then y is associated with x to the same degree, thus establishing *non-directed graphs* whose defining matrices are symmetrical relations require only $(n^2-n)/2$ elements to be defined.

A binary fuzzy relation $R(X, X)$ is (max-min) *transitive* iff:

$$R(x, z) \geq \max_{y \in X} \min[R(x, y), R(y, z)]$$

for all $x, z \in X$. This definition generalizes the crisp transitive property which requires that (x, z) be related if (x, y) and (y, z) are related, by requiring that (x, z) be related at least to the maximum of the degrees of association obtained from performing the minimum of (x, y) and (y, z) for all other y in X . That is, for each indirect connection between x and z through some y , the weight of the connection is the lowest of each connection (x to y and y to z). Finally, the weight of the connection between x and z , must be larger than the largest of all indirect connections through all y .

2.1.5 Composition of Graphs

The composition of binary relations defined on the same set is performed by composition of the matrices that define them. The logical composition of matrices is performed in the same way as the numerical counterpart, except that multiplication and summation are substituted by logical operations. In the present work, we substitute multiplication and summation by the AND and OR operations respectively. The standard definition, though many others exist, of OR and AND in fuzzy logic is the maximum and minimum operations respectively. Thus, the standard composition of fuzzy graphs is referred to as the *max-min composition*:

$$R \circ R = \max_k \min(r_{ik}, r_{kj}) = r'_{ij}$$

where r_{ij} denotes $R(x_i, x_j)$.

2.1.6 Transitive Closure

The *transitive closure* of a relation $R(X, X)$ is defined as the relation that is transitive, contains $R(X, X)$, and whose elements have the smallest possible membership weights that still allow the first two requirements to be met. In other words, the transitive closure of a relation yields a relation where all pairs of elements which were directly or indirectly related in the original relation, are now directly related with a weight which is the maximum of the set of minimally associated paths via all possible third elements. The algorithm to obtain the transitive closure R_T of R consists of the following three steps (Klir & Yuan 1995):

1. $R' = R \cup (R \circ R)$.
2. If $R' \neq R$, make $R = R'$ and go back to step 1.
3. Stop: $R_T = R'$.

Where $(R \circ R)$ represents the composition of matrices in 2.1.5.

2.1.7 Similarity Relations

A binary fuzzy relation $R(X, X)$ is a similarity relation if it is reflexive, symmetric, and transitive. These relations are also known as *equivalence relations*.

2.1.8 Proximity Relations

A binary fuzzy relation $R(X, X)$ is a proximity relation if it is reflexive and symmetric. These relations are also known as *compatibility relations*. The transitive closure of a proximity relation is a similarity relation. See figures 1 and 2.

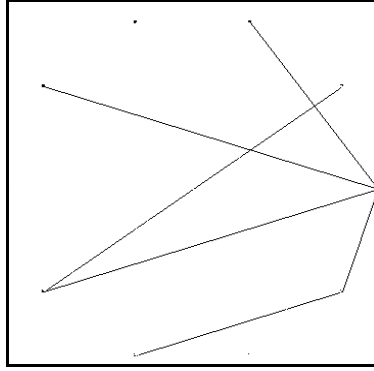


Figure 1: Proximity relation with 7 elements

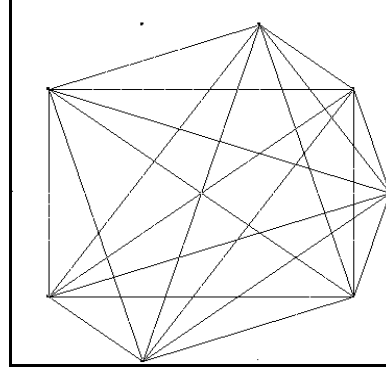


Figure 2: The similarity relation obtained from the transitive closure of the relation in figure 1

Proximity relations are very important to express relationships in databases (Shenoi & Melton 1989). They require reflexivity (elements are associated with themselves) and are symmetrical, that is, they define reflexive non-directed graphs which can capture effectively users' expert knowledge without requiring transitivity.

2.2 Proximity Relations as Co-Occurrence Probabilities

The datasets described in 1 are binary relations between two sets. For instance, **PEOPLE_DOCUMENTS1** and **PEOPLE_DOCUMENTS2** are binary relations A between the set P of n people names and the set D of m documents in the database. Specifically, these relations are also crisp since they specify if a person p occurs (1) or not (0) in a document d , that is $A(p, d) = 1$ or $A(p, d) = 0$.

To discern closeness between people according to the documents they occur in, we compute the *People Document Proximity (PDP)*, obtained from A by the following formula:

$$PDP(p_i, p_j) = \frac{\sum_{k=1}^m (a_{i,k} \wedge a_{j,k})}{\sum_{k=1}^m (a_{i,k} \vee a_{j,k})} = \frac{N_{\cap}(p_i, p_j)}{N(p_i) + N(p_j) - N_{\cap}(p_i, p_j)} \quad (1)$$

The proximity between two persons, p_i and p_j , is the probability that both p_i and p_j co-occur in the same document. It depends on the sets of documents where each person occurs, and the intersection of these sets. $N(p_i)$ is the number of documents person p_i occurs in, and $N_{\cap}(p_i, p_j)$ the number of documents both persons co-occur in. This last quantity is the number of elements in the intersection of the sets of documents that each person occurs in. Thus, two persons are near if they tend to occur in many of the same documents.

Similarly, we can obtain the complementary proximity measure from the same relation A between People and Documents: the Document People Proximity (DPP):

$$DPP(d_i, d_j) = \frac{\sum_{k=1}^n (a_{k,i} \wedge a_{k,j})}{\sum_{k=1}^n (a_{k,i} \vee a_{k,j})} = \frac{N_{\cap}(d_i, d_j)}{N(d_i) + N(d_j) - N_{\cap}(d_i, d_j)} \quad (2)$$

This proximity, defined on the set of Documents D, captures the probability that two documents d_i and d_j mention the same person. It depends on the sets of people mentioned in each document, and the intersection of these sets. $N(d_i)$ is the number of persons mentioned in document d_i , and $N_{\cap}(d_i, d_j)$ the number of people mentioned in both documents. Thus, two documents are near if they tend to mention many of the same people.

In general, given a binary relation R between sets X (of n elements x) and Y (of m elements y), we extract two complementary proximity relations: XYP and YXP . $XYP(x_i, x_j)$ is the probability that both x_i and x_j are related in R to the same element $y \in Y$. Conversely, $YXP(y_i, y_j)$ is the probability that both y_i and y_j are related in R to the same element $x \in X$. The respective formulas are:

$$XYP(x_i, x_j) = \frac{\sum_{k=1}^m (r_{i,k} \wedge r_{j,k})}{\sum_{k=1}^m (r_{i,k} \vee r_{j,k})}; \quad YXP(y_i, y_j) = \frac{\sum_{k=1}^n (r_{k,i} \wedge r_{k,j})}{\sum_{k=1}^n (r_{k,i} \vee r_{k,j})} \quad (3)$$

Notice that these formulas do not require R to be a crisp binary relation; it could be a fuzzy binary relation, for instance, the normalized frequency of occurrence of a keyword in a document.

Other measures of probability can be used to discern closeness between elements of two sets in a binary relation. In information retrieval it is common to use conditional probabilities, for instance in the *Pointwise Mutual Information* technique (Turney 2001). In this case, we do not obtain a proximity relation since conditional probabilities are not symmetric. Such a measure of closeness is calculated for the elements of X and Y as P_x and P_y :

$$P_X(x_i, x_j) = P(x_i | x_j) = \frac{\sum_{k=1}^m (r_{i,k} \wedge r_{j,k})}{\sum_{k=1}^m (r_{j,k})}; \quad P_Y(y_i, y_j) = P(y_i | y_j) = \frac{\sum_{k=1}^n (r_{k,i} \wedge r_{k,j})}{\sum_{k=1}^n (r_{k,j})} \quad (4)$$

P_X is the probability that x_i is related in R to an element $y \in Y$, given that x_j is related in R to the same y . Conversely, P_Y is the probability that y_i is related in R to the an element $x \in Y$, given that y_j is related in R to to the same x . P_X and P_Y , in general, are not symmetric, therefore they are not proximity relations, though they also capture a measure of association or closeness between elements of X and Y respectively. They are related to the proximity measures extracted from a binary relation R in the following way:

$$XYP(x_i, x_j) = \frac{1}{\frac{1}{P_X(x_j, x_i)} + \frac{1}{P_X(x_i, x_j)} - 1}; \quad YXP(y_i, y_j) = \frac{1}{\frac{1}{P_Y(y_j, y_i)} + \frac{1}{P_Y(y_i, y_j)} - 1} \quad (5)$$

For characterizing associations in relations extracted from databases, we prefer the proximity measure of association as defined in formula 3, over the conditional probabilities of formula 4, because P_X and P_Y can imply a strong degree of association (or closeness) between two elements, when that association is one-sided only. Specifically, using P_X as the measure of association, if, $N(x_j)$, the set of elements of Y related to x_j , is largely contained in $N(x_i)$, then $P_X(x_i, x_j)$ is large, implying a strong degree of association between x_i and x_j . But if, $N(x_i)$, is much larger than $N(x_j)$, then $P_X(x_j, x_i)$ is small, implying a weak degree of association between x_j and x_i .

In many applications, when we think of a strong association between two elements, we expect both directions of association to be similar. In other words, if x_i is strongly associated with x_j , then we expect x_j to be strongly associated with x_i . Therefore, in such cases, the proximity measures are a more intuitive measurement of association or closeness between elements. This is the case of the current application, where, for instance, we wish to discover which persons are more associated with each other. To consider that two persons are very associated, we want them to be related to evidential items (such as documents, events, groups) in much the same way. This means that a person who is only related to a subset of such items that another person is related to, should not be considered very close to the latter. Thus, the proximity measure is a more intuitive measure of this degree of association.

2.3 Extracting Proximity Relations from the Datasets

From all the datasets described in 1, **PEOPLE_DOCUMENTS1**, **CITIES_DOCUMENTS1**, **PEOPLE_DOCUMENTS2**, **EVENTS_GROUPS**., **EVENTS_PEOPLE**, **GROUPS_PEOPLE**, and **PEOPLE_RELATEDPEOPLE**, using formula 3, Eugene Gavrillov generated the proximity measures

PDP1, **CDP1**, and **PDP2**, and Jim Gattiker generated the proximity measures **EGP**, **GEP**, **EPP**, **PEP**, **GPP**, **PGP**, **PRP**, and **RPP**. Following the notation used in formula 3, when constructing the name of a proximity measure, the first letter denotes the first set in the relation (e.g. **P** from “People” in **PEOPLE_DOCUMENTS1**), the second letter denotes the second set in the relation (e.g. **D** from “Documents” in **PEOPLE_DOCUMENTS1**), and the third letter is always **P** for “proximity”.

3. ANALYSIS OF PROXIMITY GRAPHS

3.1 NetStat

After computing **PDP1**, we noticed that the name of "Osama Bin Laden" was associated with most every other name in the data set, therefore we decided to delete this name from the analysis. The set of People Names contains 145 entries.

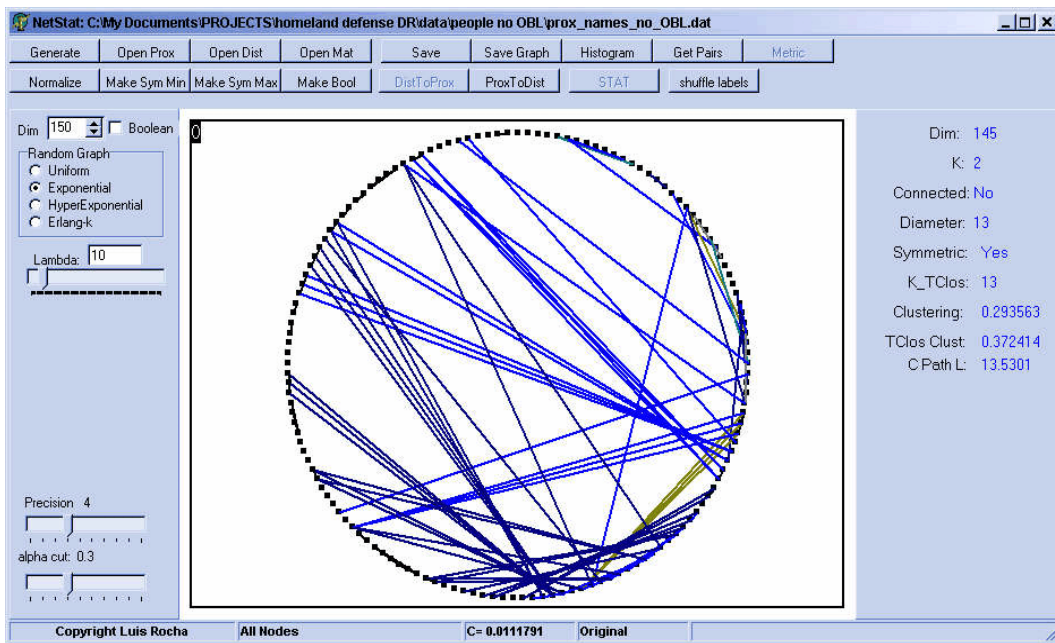


Figure 3: Netstat screen showing all links over 0.3 of **PDP1**

We developed prototype software to analyze proximity graphs: NETSTAT. Figure 3 shows the main screen of this program. It displays all nodes of a proximity graph in a circle. Each node can be clicked to display the links of a given node. It allows the user to specify the lower value of all links shown. For instance, in Figure 3, all links in **PDP1** with proximity value ≥ 3 are displayed and color coded for intensity. NETSTAT, also calculates many other graph theoretic data, such as the diameter of the graph (the longest path, in number of links, between two nodes), which is 13 in this case, the average number of neighbor nodes ($K=2$ in this case), etc. This can be seen in figure 3 on the left side panel. It also calculates the transitive closure of proximity graphs (which thus become similarity graphs), as seen in Figure 4.

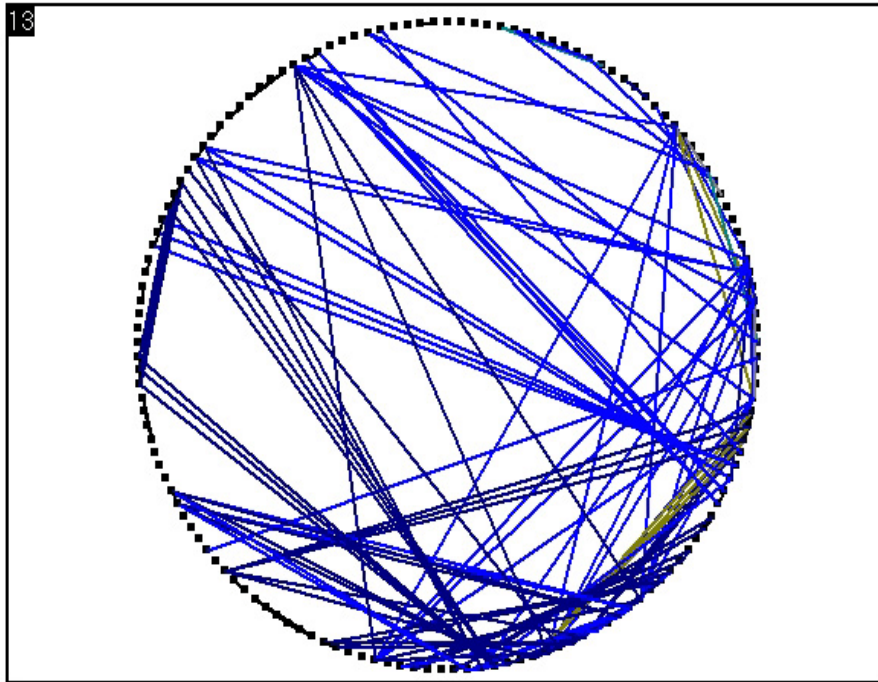


Figure 4: Transitive closure of **PDP1**, showing all links ≥ 3 .

NETSTAT also outputs in text the pairs of items shown in a proximity graph. Figure 5 shows the text output window for **FPD1** for pairs with proximity ≥ 3 . All Pairs of people names in **PDP1** with proximity ≥ 3 are included in appendix A.1. We recall that these values of proximity denote the probability of co-occurrence of two names in the documents in the database. Naturally, NetStat also produces the list of pairs of items in the transitive closure of proximity graphs. In appendix A.2, the pairs of people names whose transitive closure of PDP1 is greater or equal to 3 are displayed.

All values with **PDP1** ≥ 0 are plotted in figure 6. We have also calculated that the distribution of proximity values shown in figure 6, passes a χ^2 test for an exponential random distribution² with $\lambda = 4.6$.

We conducted exactly the same analysis for the remaining proximity graphs, with the results listed in appendix A.

²The exponential probability distribution function is $F(t) = \lambda e^{-\lambda t}$, $t \geq 0$, $\lambda > 0$.



Figure 5: Textual output of NetStat

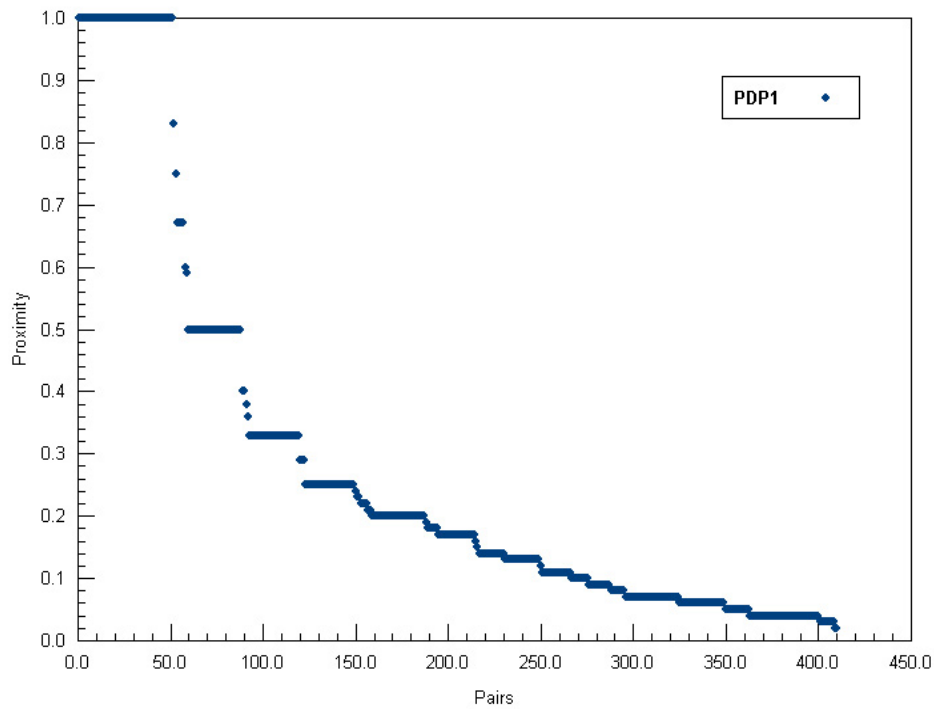


Figure 6: Plot of all pairs with $PDP1 \geq 0$.

3.2 Comparison with PEOPLE_DOCUMENTS1 Subset used by Lattice Group

Cliff Joslyn and Susan Mniszewski analyzed a subset of the PEOPLE_DOCUMENTS1 relation containing the following 36 people and 16 document subsets:

$\mathcal{P} = \{\text{Abdelsattar Dahmane, Abdullah Ahmed Abdullah, Abu Bakar Bashir, Abu Qatada, Ahmad Shah Masud, Ahmed Ressam, Anas al-Liby, Ayman aL- Zawahiri, Bouraoui El-Ouaer, Faiz Abu Bakar Bafana, Fateh Kamel, Fathur Rohman al-Ghozi, Jamal al-Fadal, Mohamad Khalim bin Jaffar, Mohamed Sliti, Mohammed Saddiq Odeh, Mohammed bin Laden, Muammar Abu Minyar Al- Qadhafi, Muhammad Atef, Mustapha Labsi, Omar Bakri Mohammed, Osama Bin Laden, Richard Reid, Riduan Isamuddin, Saif Al-Adel, Shaykh Ahme Nur Jimale, Sheikh Omar Abd al-Rahman, Sulaiman Abu Ghaith, Tarek Maaroufi, Victor Bout, Yacine Aknouche, Yasin al-Qadi, Yasir al-Sirri, Youssef Nada, Zacarias Moussaoui, Zayn-al-Abidin Abu-Zubaydah}\}$

$\mathcal{D} = \{3, 13, 52, 54, 56, 59, 137, 144, 149, 153, 160, 294, 449, 537, 636, 662\}$

We calculated the people proximity ($\mathbf{PDP1}_{\text{sub}}$) and document proximity ($\mathbf{DPP1}_{\text{sub}}$) for this subset, as provided by Cliff Joslyn and Susan Mniszewski, of the PEOPLE_DOCUMENTS1 Relation. Figure

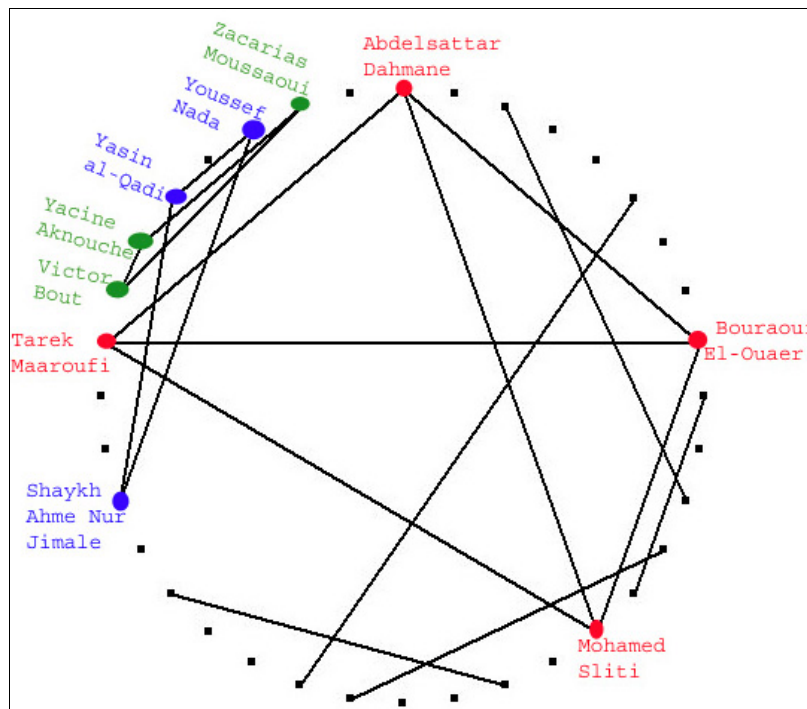


Figure 7: $\mathbf{PDP1}_{\text{sub}}$ showing only links with proximity = 1

7 shows $\mathbf{PDP1}_{\text{sub}}$ for those links with maximum proximity (1). These are people names who appear in exactly the same documents (and only in those). Figure 7 highlights 3 groups of people (one with 4 people, the other with 3).

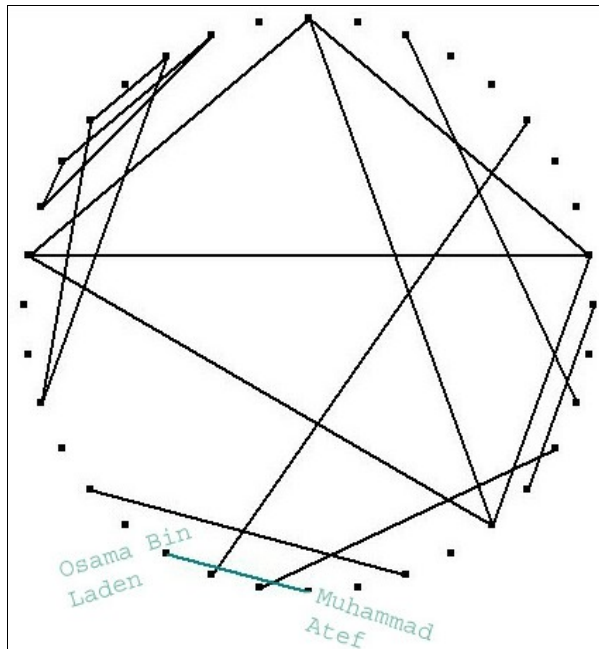


Figure 8: $\mathbf{PDP1}_{\text{sub}}$ showing only links with proximity ≥ 0.5

Figure 8 depicts the same graph, but now showing all links with proximity ≥ 0.5 ; another link appears. Figure 9 depicts the same graph, showing all links with proximity ≥ 0.4 ; Many more links appear.

While the graphs in figures 7 and 8 (prox = 1, and prox ≥ 0.5) are naturally transitively closed, the one in Figure 9 is not. Figure 10 depicts the transitive closure of $\mathbf{PDP1}_{\text{sub}}$ showing links with proximity ≥ 0.4 .

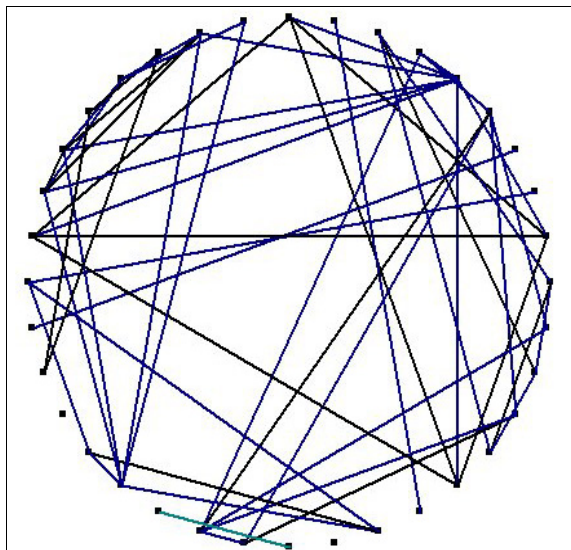


Figure 9: $\mathbf{PDP1}_{\text{sub}}$ showing only links with proximity ≥ 0.4

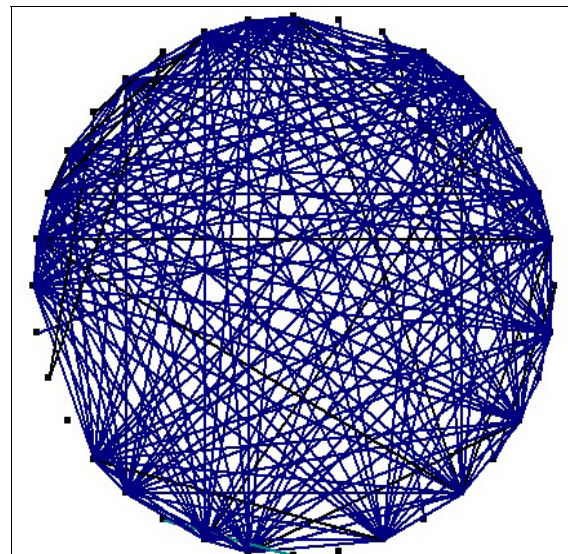


Figure 10: Transitive Closure of $\mathbf{PDP1}_{\text{sub}}$ showing links with proximity ≥ 0.4 .

We repeated the same process with $\mathbf{DPP1}_{\text{sub}}$, which denotes the probability that two documents
 Figure 11 depicts $\mathbf{DPP1}_{\text{sub}}$ (left) and its transitive closure (right) showing all links with proximity ≥ 0.4 .

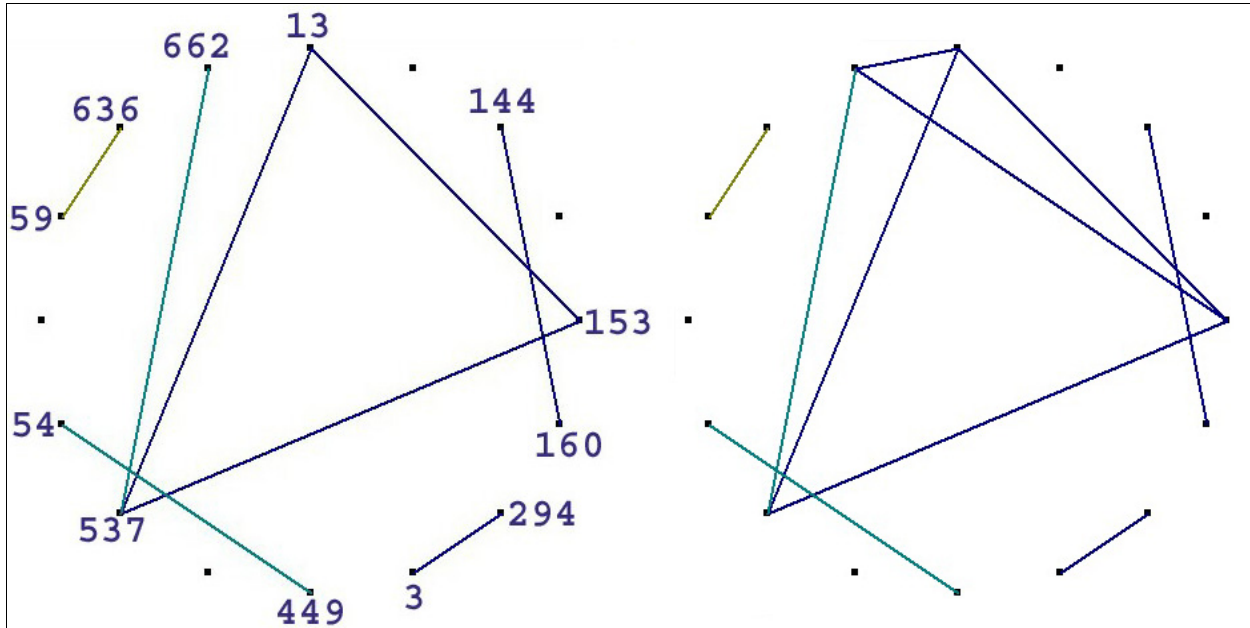


Figure 11: $\mathbf{DPP1}_{\text{sub}}$ (left) and its transitive closure (right) showing all links with proximity ≥ 0.4 .

After this first iteration to compare the proximity graphs with the lattice approach, we posit that, co-occurrence proximity graphs capture all of the information that lattices do as well as additional information. Given a relation R between two sets X and Y , the complementary proximity graphs XYP and YXP , one obtains using formula 3, capture all co-occurrence information among the elements of set X and set Y respectively. A lattice path between two elements of X via an element of Y must exist as a co-occurrence probability, that is a link, in the XYP graph (and vice versa). Furthermore, proximity graphs allow us to grasp levels of co-occurrence probability, which lattice representations do not. In a proximity graph, we can choose to visualize only the links above a given $\alpha \in [0, 1]$.

However, a lattice representation may offer an alternative view of the R relation in a single graph, as opposed to the two distinct XYP and YXP graphs. In particular, given the complexity of lattice graphs with many elements, a lattice representation may be an interesting analysis tool to visualize a subset of nodes of interest in large proximity graph.

4. SEMI-METRIC BEHAVIOR OF PROXIMITY GRAPHS

4.1 From Proximity to Distance

From the inverse of the generic proximity measures XYP and YXP , obtained from a relation R between sets X and Y using formula 3, we can compute a generic distance function among the elements of X or Y :

$$d_X(x_i, x_j) = \frac{1}{XYP(x_i, x_j)} - 1; \quad d_Y(y_i, y_j) = \frac{1}{YXP(y_i, y_j)} - 1 \quad (6)$$

d_X and d_Y are distance functions because they are nonnegative, symmetric, real-valued functions such that $d(x, x) = 0$ (Shore & Sawyer 1993). They define two weighted graphs D_X and D_Y , which we refer to as *distance graphs*, whose vertices are all of the elements of X or Y , and the edges are the values of $d_X(x_i, x_j)$ and $d_Y(y_i, y_j)$, respectively. A small distance between elements implies a strong association between them.

4.2 Semi-metric behavior: latent associations

The distance graphs D obtained from applying distance function d (formula 6) to proximity graphs, are not Euclidean because, for a pair of elements of X (or Y) x_1 and x_2 , the triangle inequality may be violated: $d(x_1, x_2) \leq d(x_1, x_3) + d(x_3, x_2)$ for some element x_3 . This means that the shortest distance between two elements in D may not be the direct link but rather an indirect pathway. Such distance functions are referred to as semi-metrics (Galvin & Shore 1991).

Naturally, the distance graphs obtained from applying a distance function such as d can be made Euclidean. If we compute the transitive closure of the respective proximity, we would obtain a similarity relation on the set of keywords. The application of distance d (formula 6) to a similarity graph would result in a metric distance graph. Indeed, it is very common in the analysis of social or document networks to impose a metric requirement on the distance graphs generated. However, we have compiled evidence elsewhere (Rocha 2002) that loosening the metric requirement, results in a methodology capable of identifying important associations between the elements of proximity graphs obtained from a relation R .

Specifically, those pairs of elements with larger semi-metric behavior (those which possess at least one indirect path between them whose distance is much shorter than the direct link) denote a *latent* association. That is, an association which is not grounded on direct evidence provided by the relation R , but rather implied by the overall network of associations in this relation. More formally, when $d(x_i, x_j) \ll d(x_i, x_k) + \dots + d(x_l, x_m) + \dots + d(x_p, x_j)$, then the pair (x_i, x_j) possesses a latent association in distance graph D .

What a latent association means depends on the semantics of the application. For instance, in graphs of keyword co-occurrence in documents, a latent association is associated with novelty and can be used to identify trends (Rocha 2002). In the case of terrorist networks, a latent association may identify pairs of people, groups, etc. for which we do not have direct evidence, in the available documents, that a real association exists, but who could easily be indirectly associated.

4.3 Characterizing Semi-metric behavior

Clearly, semi-metric behavior (or latency) is a question of degree. For some pairs of vertices the indirect distance provides a much shorter short-cut, a larger reduction of distance, than for others. One way to capture this property of pairs of semi-metric vertices is to compute a *semi-metric ratio*:

$$s(x_i, x_j) = \frac{d_{direct}(x_i, x_j)}{d_{shortest}(x_i, x_j)} \quad (7)$$

where $d_{shortest}$ is the shortest, direct or indirect, distance between the pair of elements. s is positive and ≥ 1 for semi-metric pairs. Given that larger graphs tend to show a much larger spread of distance, s tends to increase with the number of vertices of D . Therefore, to be able to compare semi-metric behavior between different distance graphs, a *relative semi-metric ratio* is used:

$$rs(x_i, x_j) = \frac{d_{direct}(x_i, x_j) - d_{shortest}(x_i, x_j)}{d_{max} - d_{min}} \quad (8)$$

rs compares the semi-metric distance reduction to the maximum possible distance reduction in graph D . d_{max} is the largest direct distance in the graph, and $d_{min} = 0$ is the shortest distance in the entire graph. This ratio varies between 0 and 1 for semi-metric pairs, and it is negative for metric pairs.

Often, the direct distance between two elements is ∞ because they do not relate to any common elements in the other set of relation R . As a result, s and rs are also ∞ for these cases. Thus, s and rs are not capable of discerning semi-metric behavior for pairs that do not have an initial finite direct distance. To detect relevant instances of this infinite semi-metric reduction, we define the *below average ratio*:

$$b(x_i, x_j) = \frac{\overline{d_{x_i}}}{d_{shortest}(x_i, x_j)} \quad (9)$$

where $\overline{d_{x_i}}$ represents the average direct distance from x_i to all x_k such that $d_{direct}(x_i, x_k) \geq 0$. b is only applied to semi-metric pairs of elements (x_i, x_j) where $d_{shortest}(x_i, x_j) < d_{direct}(x_i, x_j)$ and it measures how much the shortest indirect distance between x_i and x_j falls below the average distance of all

elements x_k directly associated with element x_i . Note that $b(x_i, x_i) \neq b(x_j, x_i)$. Of course, b can also be applied to pairs with finite semi-metric reduction. $b > 1$ denotes a below average distance reduction.

The ratios from formulas 7 to 9 allow us to identify individual pairs of elements with large semi-metric behavior – latent pairs. However, we can also characterize entire distance graphs as to their semi-metric behavior. To do this, we compute the ratio of pairs in a distance graph D with $r_s > 0$, denoted by π , and those with $b > 1$, denoted by β . Another measure (see (Rocha 2002) for more details), is the mean value of r_s of the top 1% pairs with $r_s > 0$ in a given distance graph D . In other words, we rank all pairs in D according to r_s , and then selected the top 1%³. We denote by μ the mean value of r_s in this set. A metric distance graph yields $\pi=0$, $\beta=0$, and $\mu=0$. For semi-metric distance graphs, these ratios vary in the unit interval.

5 ANALYSIS OF SEMI-METRIC BEHAVIOR IN DATASETS: CAPTURING INDIRECT AND LATENT ASSOCIATIONS

5.1 Semi-metric behavior of Distance Graphs

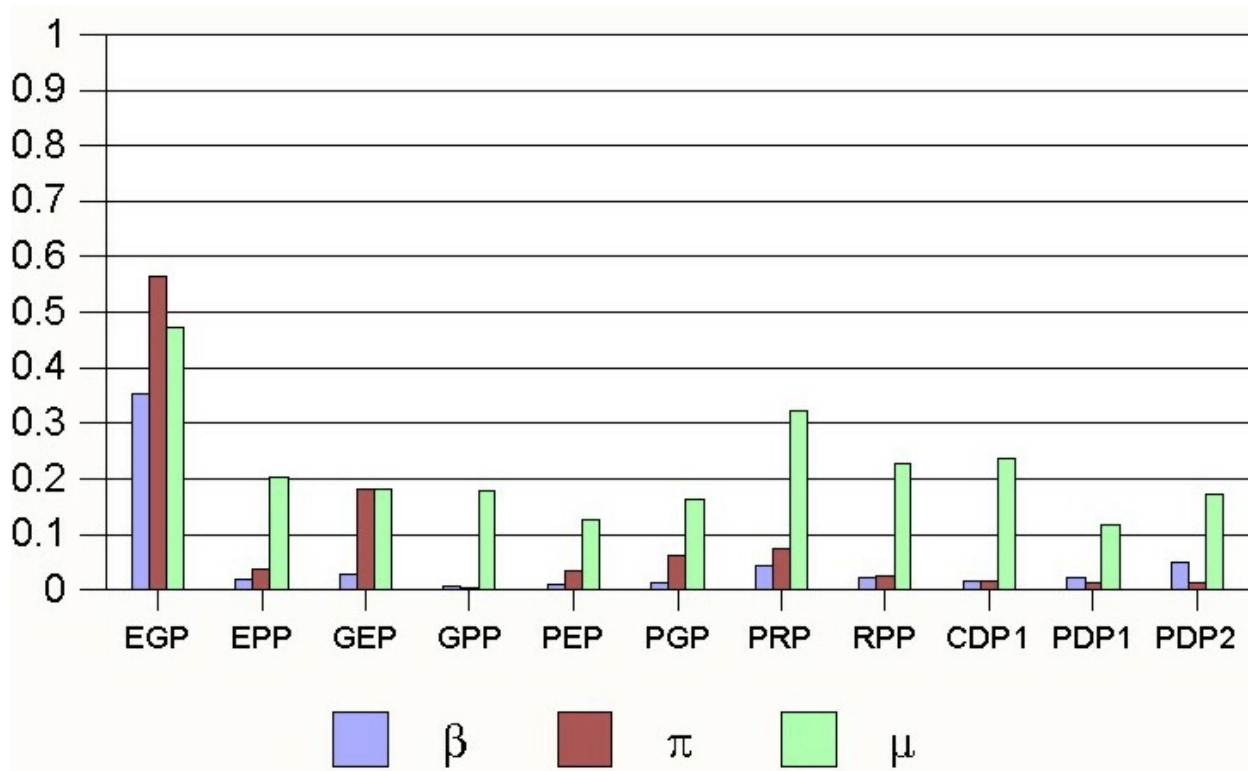


Figure 12: Semi-metric behavior of all data sets

³Not 1% of the set of semi-metric pairs, but 1% of all pairs in D .

We can now compare the different distance graphs obtained from the data sets according to π , β , and μ . π and β quantify the existence of semi-metric behavior in a distance graph. Specifically, π captures the ratio of pairs with finite direct distance, which possess at least a shorter indirect path. While β captures the ratio of pairs with finite or infinite direct distance, which possess at least one indirect path shorter than the average of all direct paths to one of the elements of the pair. The parameter μ captures the strength of the type of semi-metric behavior capture by π (see details in (Rocha 2002)). Figure 12 depicts a bar plot of these three parameters for the distance graphs obtained for each proximity graph produced in section 2.3. Table 1 shows the actual numerical values. We can see that most distance graphs possess very little semi-metric behavior. π and β are small for most of them. For instance, the distance graph obtained from **PDP2**, contains only 1.2% of pairs with $rs > 0$, and 4.8% with $b > 1$. This means that very few pairs of people names have shorter indirect distances, thus, there is not much latent information in the documents used to generate **PDP2**. Most people names who can be associated have been identified in the documents. The datasets that are most semi-metric, thus with largest number of indirect or latent pairs, are the distance graphs obtained from **EGP** and **GEP**.

Table 1: Semi-metric behavior parameters for all data sets

	EGP	EPP	GEP	GPP	PEP	PGP	PRP	RPP	CDP1	PDP1	PDP2
β	0.3526	0.0192	0.0273	0.0057	0.0082	0.0137	0.0424	0.0236	0.0172	0.0216	0.0481
π	0.5641	0.0385	0.1818	0.0043	0.0337	0.0606	0.0742	0.0254	0.0157	0.0125	0.0124
μ	0.4713	0.2021	0.1815	0.1793	0.1273	0.1619	0.3219	0.2292	0.2378	0.1166	0.173

But in addition to the quantity of semi-metric pairs, we need to describe the strength of semi-metric behavior. Parameter μ captures that factor. Notice that we can easily obtain a distance graph with many semi-metric pairs (large π and β), but with very low values of rs and b , thus weak latency. This is the case of most random graphs (see Rocha (Rocha 2002)). One way to compare several distance according to both quantity and strength of latent (semi-metric) behavior, is to plot the values of μ and π in a two-dimensional plane, as depicted in Figure 13. The first parameter quantifies the existence of *strong latent associations*, whereas the second quantifies the *quantity of latent associations* – or how further away from metric the distance graph is. A metric distance graph would occupy the origin of this space. The further away from the origin a distance graph is, the more we can consider it to denote *incomplete knowledge*. For instance, if the **PDP2** graph were further away from the origin, we would say that the documents in the database were missing many, strong, latent associations between people.

5.2 Identification of Latent Pairs

From an analysis standpoint, after calculating the semi-metric behavior of the distance graph of a given dataset, one is naturally interested in identifying the specific pairs of elements that are most semi-metric – those with higher latency. These are pairs of elements (e.g. people names) whose strong association does not possess direct evidence in a given relation (e.g. co-occurrence in

documents), but is rather implied by the overall associative network obtained from the relation. We can say that a strong latent association between pairs of elements is a global property of the network.

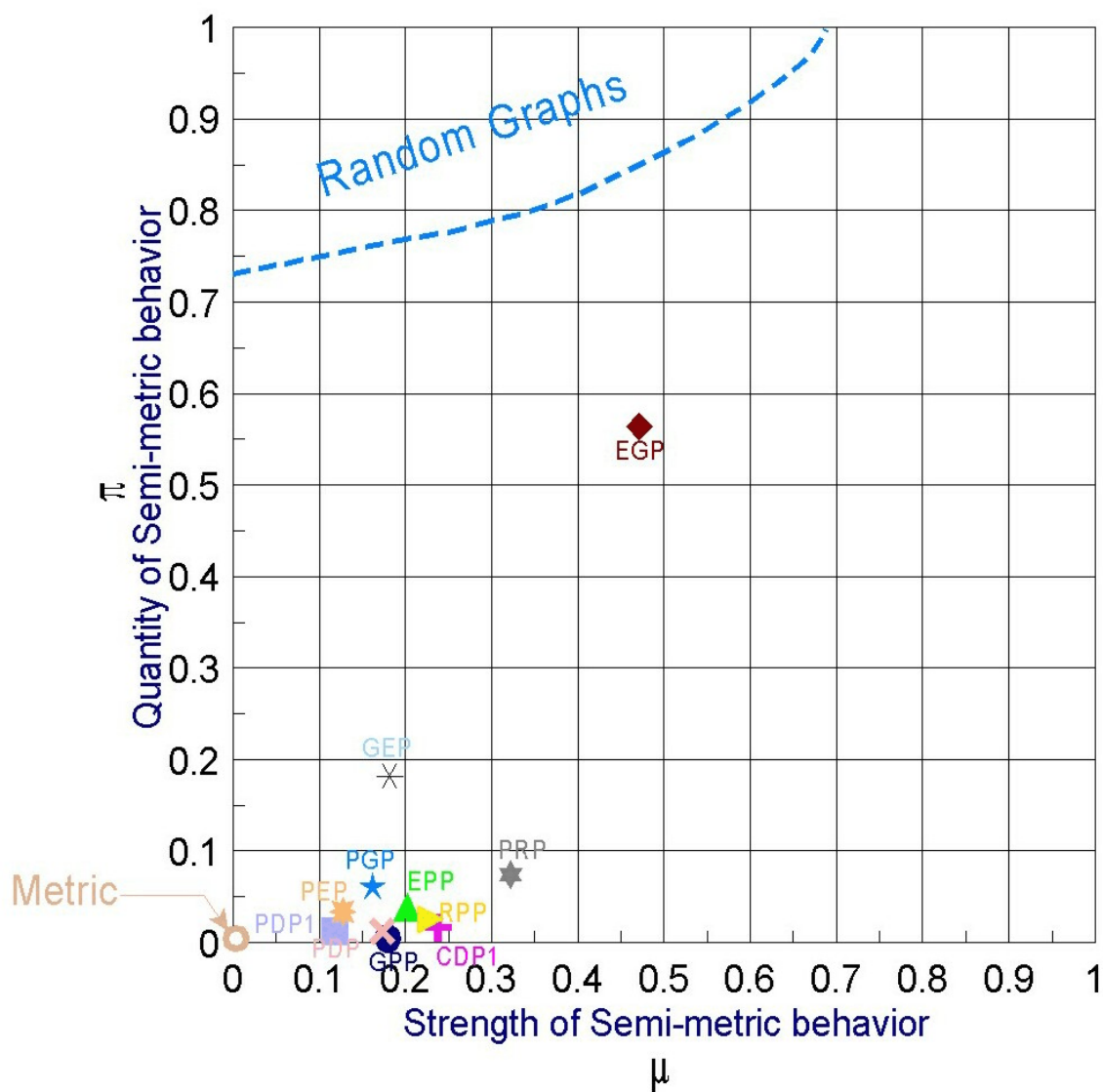


Figure 13: Plot of all data sets in μ and π plane.

In Appendix B, the top semi-metric pairs for the distance graphs obtained from all the proximity relations produced in section 2.3 are listed. We list only those pairs for which $s \geq 2$ (pairs of elements which possess at least one indirect path half as short as the direct distance between them), $rs \geq 0.25$ (pairs of elements which possess at least one indirect path which reduces the distance between them by at least 25% of the largest possible direct distance in the graph), or $b \geq 2$ (pairs of elements which possess at least one indirect path half as short as the average distance to all elements directly connected to one of the elements in the pair). These values are somewhat arbitrary, but were chosen to pick up pairs with substantial semi-metric behavior.

5.3 Comparison with Lattice Subset

In section 3.2 we calculated the people proximity ($\mathbf{PDP1}_{\text{sub}}$) and document proximity ($\mathbf{DPP1}_{\text{sub}}$) for a subset of the PEOPLE_DOCUMENTS1 Relation. We compared the information one gets from applying the proximity analysis with the lattice methodology. We also calculated the most semi-metric pairs in the distance graphs obtained from $\mathbf{PDP1}_{\text{sub}}$ and $\mathbf{DPP1}_{\text{sub}}$. Figure 14 depicts $\mathbf{PDP1}_{\text{sub}}$ with two semi-metric pairs highlighted.

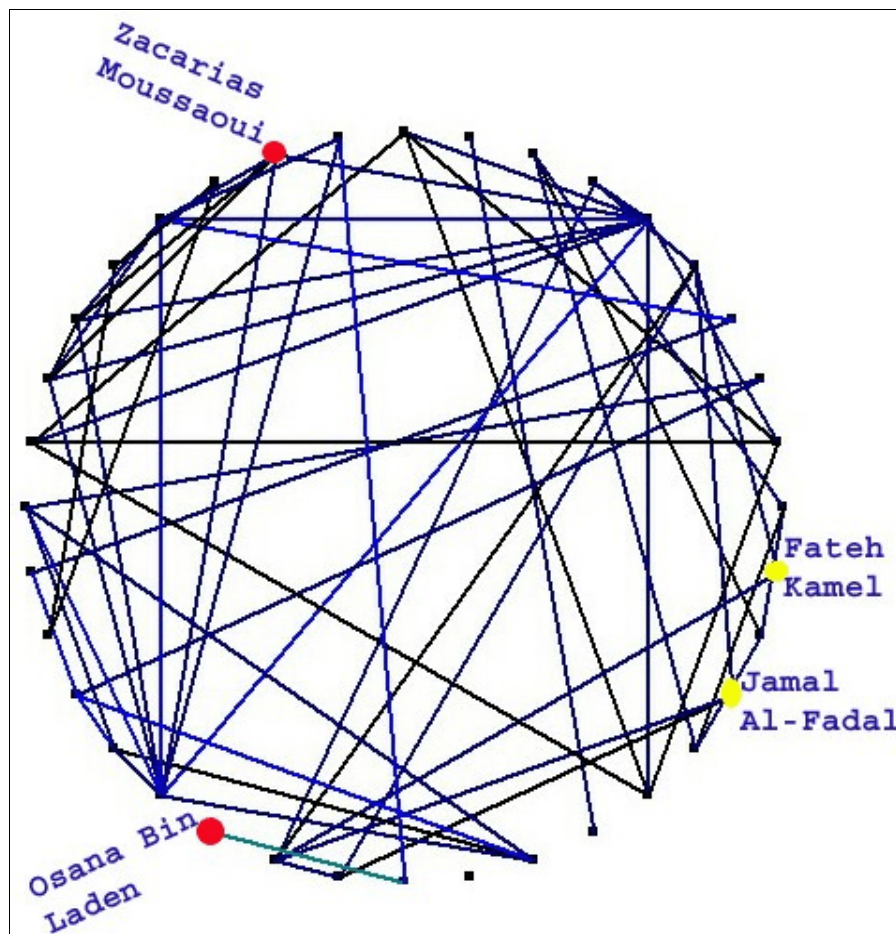


Figure 14: $\mathbf{PDP1}_{\text{sub}}$ showing links with proximity ≥ 0.3 . The pair with highest s is highlighted in red and the pair with highest b is highlighted in yellow

Specifically, below are the top semi-metric pairs:

Pairs from $\mathbf{PDP1}_{\text{sub}}$ with $s \geq 2$

Osama Bin Laden, Yacine Aknouche: 2.9461
Osama Bin Laden, Zacarias Moussaoui: 2.9461

Osama Bin Laden, Riduan Isamuddin: 2.9461
 Mohammed bin Laden, Osama Bin Laden: 2.9461
 Osama Bin Laden, Victor Bout: 2.9461
 Fathur Rohman al-Ghozi, Osama Bin Laden: 2.8702
 Abu Bakar Bashir, Osama Bin Laden: 2.8702
 Ahmad Shah Masud, Osama Bin Laden: 2.8125
 Muhammad Atef, Richard Reid: 2.6667
 Muhammad Atef, Yasir al-Sirri: 2.6667
 Osama Bin Laden, Sheikh Omar Abd al-Rahman: 2.4337
 Fateh Kamel, Osama Bin Laden: 2.2094
 Mustapha Labsi, Osama Bin Laden: 2.2094
 Jamal al-Fadal, Osama Bin Laden: 2.2094

Pairs from $PDPI_{sub}$ with $rs \geq 0.25$

Ahmad Shah Masud, Osama Bin Laden: 0.6444
 Osama Bin Laden, Zacarias Moussaoui: 0.6162
 Osama Bin Laden, Yacine Aknouche: 0.6162
 Osama Bin Laden, Riduan Isamuddin: 0.6162
 Mohammed bin Laden, Osama Bin Laden: 0.6162
 Osama Bin Laden, Victor Bout: 0.6162
 Abu Bakar Bashir, Osama Bin Laden: 0.6078
 Fathur Rohman al-Ghozi, Osama Bin Laden: 0.6078
 Osama Bin Laden, Sheikh Omar Abd al-Rahman: 0.5495
 Mustapha Labsi, Osama Bin Laden: 0.5106
 Jamal al-Fadal, Osama Bin Laden: 0.5106
 Fateh Kamel, Osama Bin Laden: 0.5106
 Mohammed Saddiq Odeh, Osama Bin Laden: 0.4327
 Muammar Abu Minyar Al- Qadhafi, Osama Bin Laden: 0.4078
 Muhammad Atef, Richard Reid: 0.3334
 Muhammad Atef, Yasir al-Sirri: 0.3334

Pairs from $PDPI_{sub}$ with $b \geq 2$

Fateh Kamel, Jamal al-Fadal: 2.3741
 Mustapha Labsi, Fateh Kamel: 2.3741
 Fateh Kamel, Mustapha Labsi: 2.3741
 Jamal al-Fadal, Fateh Kamel: 2.3741
 Riduan Isamuddin, Victor Bout: 2.2138
 Mohammed bin Laden, Victor Bout: 2.2138
 Mohammed bin Laden, Yacine Aknouche: 2.2138
 Mohammed bin Laden, Zacarias Moussaoui: 2.2138
 Riduan Isamuddin, Zacarias Moussaoui: 2.2138
 Riduan Isamuddin, Yacine Aknouche: 2.2138
 Osama Bin Laden, Victor Bout: 2.1198
 Osama Bin Laden, Yacine Aknouche: 2.1198
 Osama Bin Laden, Zacarias Moussaoui: 2.1198
 Osama Bin Laden, Riduan Isamuddin: 2.1198
 Osama Bin Laden, Mohammed bin Laden: 2.1198
 Osama Bin Laden, Abu Bakar Bashir: 2.0652
 Osama Bin Laden, Fathur Rohman al-Ghozi: 2.0652

Pairs from $DPPI_{sub}$ with $s \geq 2$

52, 144: 2.6668
54, 636: 2.4384
3, 54: 2.3078
54, 56: 2.3078
54, 59: 2.2767
54, 537: 2.2767
153, 636: 2.2499
54, 153: 2.1182

Pairs from $DPPI_{sub}$ with $rs \geq 0.25$

54, 636: 0.5899
54, 153: 0.4872
52, 144: 0.4806
54, 59: 0.4745
54, 537: 0.4745
54, 56: 0.4358
3, 54: 0.4358
153, 636: 0.3844
52, 294: 0.3273
13, 52: 0.308
52, 149: 0.308
54, 137: 0.282
153, 537: 0.2691

Pairs from $DPPI_{sub}$ with $b \geq 2$

None.

6 CONFIDENCE IN RESULTS: CAPTURING LATENT KNOWLEDGE

The links in proximity graphs represent an observable and meaningful quantity, namely the co-occurrence of pairs of elements of one set in elements of another set related by binary relation. But the semi-metric behavior of these pairs of elements, as calculated by formulas 7 to 9, does not possess such an obvious meaning.

In section 5 we identified semi-metric behavior with latent knowledge. That is, semi-metric pairs of elements may denote a real association between the elements, but one which is not directly corroborated by available evidence (in the relation under scrutiny). In this sense, semi-metric pairs may denote missing evidence or knowledge. To understand if this is the case we conducted two different types of tests: an expert test, to identify if semi-metric pairs imply real associations, and a random deletion test, to characterize how well semi-metric recover lost knowledge. The next two sub-sections describe these tests in detail.

6.1 Expert Test

From **PDP1**, we extracted the top 100 pairs of people names with highest rs and the top 200 pairs of people names with highest b . We then generated several random graphs with the same people names as **PDP1**. Specifically, we generated the following 10 random proximity graphs:

- 4 graphs obtained from randomly shuffling the people name node labels.
- 3 random graphs with the same random distribution of weights than **FDP1**. From our analysis (exponential random distribution with $\lambda = 4.6$, see section 3.1)
- 3 random graphs with uniform distribution of weights.

From each of these 10 random graphs we extracted the top 10 pairs of people names with highest rs and the top 20 pairs of people names with highest b .

A software application was developed to ask experts the relevance of pairs. The pairs were displayed to experts by random sampling from the mixed set of 300 people name pairs extracted from the semi-metric behavior of the real **PDP1** and 300 from the semi-metric behavior of random graphs. Given a pair of people names, experts were asked if the pair was relevant, not relevant, or they did not know the relevance. Figure 15 depicts the results.

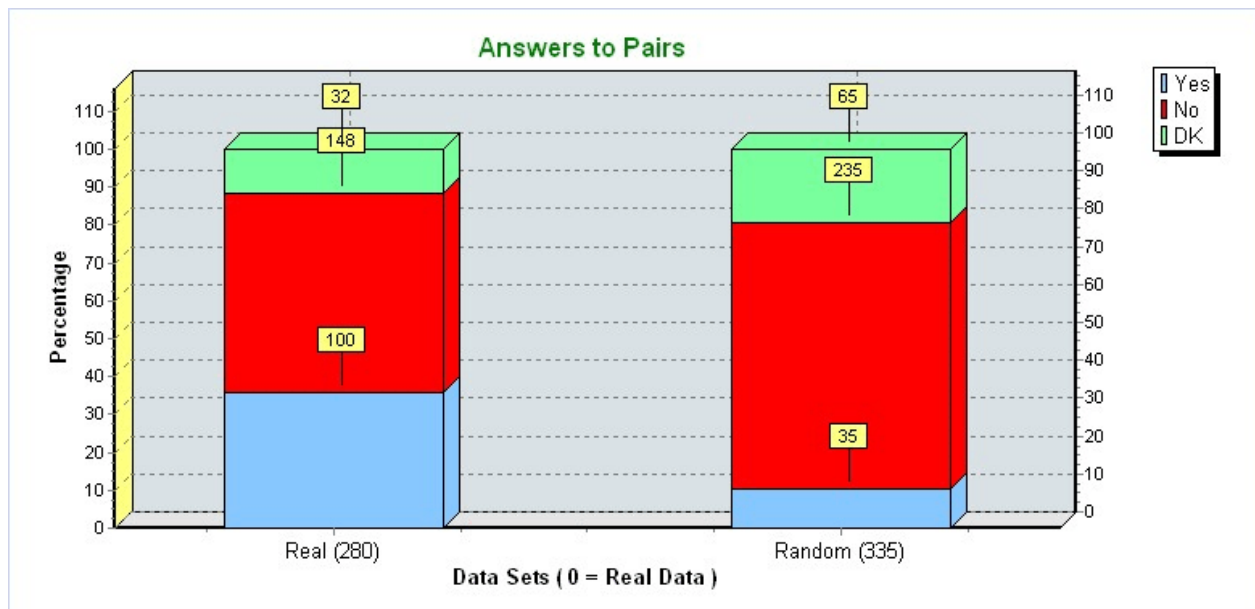


Figure 15: Comparison of expert responses to real semi-metric and random pairs.

Experts were asked about the relevance of 280 real pairs and 335 random ones. Of the real pairs, 36% were deemed relevant, 53% irrelevant, and 11% were unknown. Of the random pairs, 10% were deemed relevant, 70% irrelevant, and 20% the relevance was unknown.

We also calculated a measure of the uncertainty of expert responses. Experts were often posed the same pair more than once, and in some occasions responded differently. To measure this conflict among answers given to the same pairs of elements, we used the Shannon measure of uncertainty, which in this case becomes:

$$H(p_i, p_j) = -\left(m(\text{yes}) \cdot \log_2(m(\text{yes})) + m(\text{no}) \cdot \log_2(m(\text{no})) + m(\text{dk}) \cdot \log_2(m(\text{dk}))\right) \quad (11)$$

where $H(p_i, p_j)$ denotes the entropy for the answer to pair of names (p_i, p_j) , $m(\text{yes})$ is the probability of an expert answering “yes” to this pair, $m(\text{no})$ is the probability of an expert answering “no” to this pair, and $m(\text{dk})$ is the probability of an expert answering “don’t know” to this pair.

We computed the value of $H(p_i, p_j)$ for every pair that received more than one answer from the experts (86 out of 280 for the set of real pairs 107 out of 335 for the set of random pairs). The average entropy for these pairs was 0.2 for the real pairs and 0.33 for the random pairs.

The maximum value of H for three alternatives is 1.59. This value is achieved when the probability of answering yes, no, or don’t know are equal and 1/3. This would imply that in such a case the experts would be maximally uncertain about the answer – a state of complete lack of knowledge. Given the average entropies calculated, we can say that the expert entropy for the real pairs was 12.6% of maximum entropy, and for the random pairs it was 21%. These values are not error rates, but rather an indication of the level of uncertainty of experts in their answers. Experts were not completely certain of their answers, they were also far from complete uncertainty.

While the experts responded yes 36% of the time to real pairs and only 10% to random pairs, they still found that 53% of real pairs picked by the semi-metric methodology were irrelevant. We note that in other datasets this methodology has obtained much stronger positive expert response. For instance, in a separate experiment we obtained pairs of scientific journal names from the web logs of the Research Library at LANL. Experts responded yes 67% (no 9%) of the time to the real semi-metric pairs obtained from the analysis of the journal data set, and only yes 21% (no 52%) of the time to random journal pairs.

Several reasons can be found for such a relatively low level of yes answers in the **PDP1** data. First, in comparison to the journal data sets, the pool of experts was much smaller for **PDP1**. Also, as discussed in section 5, **PDP1** does not possess much or very strong semi-metric behavior. This means that there are not that many real latent associations to discover in this dataset to begin with. Finally, the semi-metric analysis used to discover latent behavior is not an ideal methodology to test by expert queries. Indeed, this analysis intends to discover novel associations that do not explicitly occur in expert data (namely documents in this case). Therefore, when we ask an expert, who compiled the documents, if an association that is not found in them makes sense, they are prone to respond “no” since they know of no document where the association is made.

The goal of this analysis is to discover “holes” in expert data in order to warn experts of potentially missing information. Therefore, another type of test discussed in the next subsection may be a better means to test the utility of the semi-metric methodology against this goal.

6.2 Random Deletions Test

This test was suggested by John Hogden; the idea is that if a given proximity graph captures “perfect” knowledge, then if we randomly delete some of its links, the semi-metric methodology should be good at recovering some of the deleted links – if it is a good methodology for discovering latent associations.

To produce a graph with “perfect knowledge”, we compute the transitive closure of a proximity graph. The transitive closure, a similarity relation (see section 2.1.7), captures all possible indirect associations in the data. The distance graph obtained from a similarity relation is fully metric – no semi-metric behavior is observed. We computed the transitive closures of **PDP1** and **PDP2**, which we name **PDP1^{TC}** and **PDP2^{TC}**, respectively.

Table 2: Results of full random deletions in **PDP1^{TC}**

p_del	%Total Pairs Deleted	stdv	%b	stdv	Corr	stdv
0	0	0	0	0	----	----
0.05	3.378	0.1894	2.378	0.1512	0.732	0.088
0.1	6.763	0.2341	4.73	0.2053	0.69	0.0743
0.15	10.127	0.2621	6.994	0.2361	0.674	0.0769
0.2	13.497	0.3119	9.153	0.3178	0.652	0.0741
0.25	16.857	0.3247	11.113	0.4014	0.631	0.0686
0.3	20.276	0.3588	13.126	0.508	0.619	0.0622
0.35	23.592	0.367	14.844	0.5456	0.607	0.07
0.4	26.97	0.4104	16.26	0.6272	0.607	0.067
0.45	30.433	0.381	17.795	0.7922	0.589	0.0637
0.5	33.76	0.3735	18.838	0.8804	0.566	0.0629
0.55	37.12	0.3736	19.526	0.9494	0.537	0.0734
0.6	40.575	0.3994	19.958	1.0843	0.519	0.0705
0.65	43.832	0.3846	19.995	1.0208	0.49	0.0695
0.7	47.243	0.377	19.488	1.2765	0.459	0.0709
0.75	50.571	0.338	18.556	1.243	0.396	0.0798
0.8	54.084	0.3348	16.453	1.4558	0.335	0.0883
0.85	57.395	0.3077	13.551	1.3198	0.284	0.0889
0.9	60.731	0.2404	8.593	1.2005	0.218	0.0803
0.95	64.122	0.1653	2.956	0.6063	0.175	0.1188
1	67.5	0	0	0	---	---

For each one of these similarity graphs we randomly deleted links with a certain probability. Specifically, we used $p_{del} = 0, 0.05, 0.1, \dots, 0.95, 1$. For every value of p_{del} we produced 100

graphs by deleting each link in the graph, independently, with this probability. That is, we produced 100 graphs by deleting, with 0.05 probability, links in $\mathbf{PDP1}^{TC}$ and $\mathbf{PDP2}^{TC}$, 100 graphs for 0.1, etc.

Table 2 shows the results of these random deletions in $\mathbf{PDP1}^{TC}$. For each level of probability of deletion, the second and third columns show the percentage of total positive links between pairs of elements on the graph that were actually deleted, and the standard deviation of this value (for 100 generated graphs) respectively. Notice that the percentage of links deleted accounts for only those links that had a positive proximity. Therefore, for these graphs, the percentage of actually deleted links is smaller than $p_{del} * 100$.

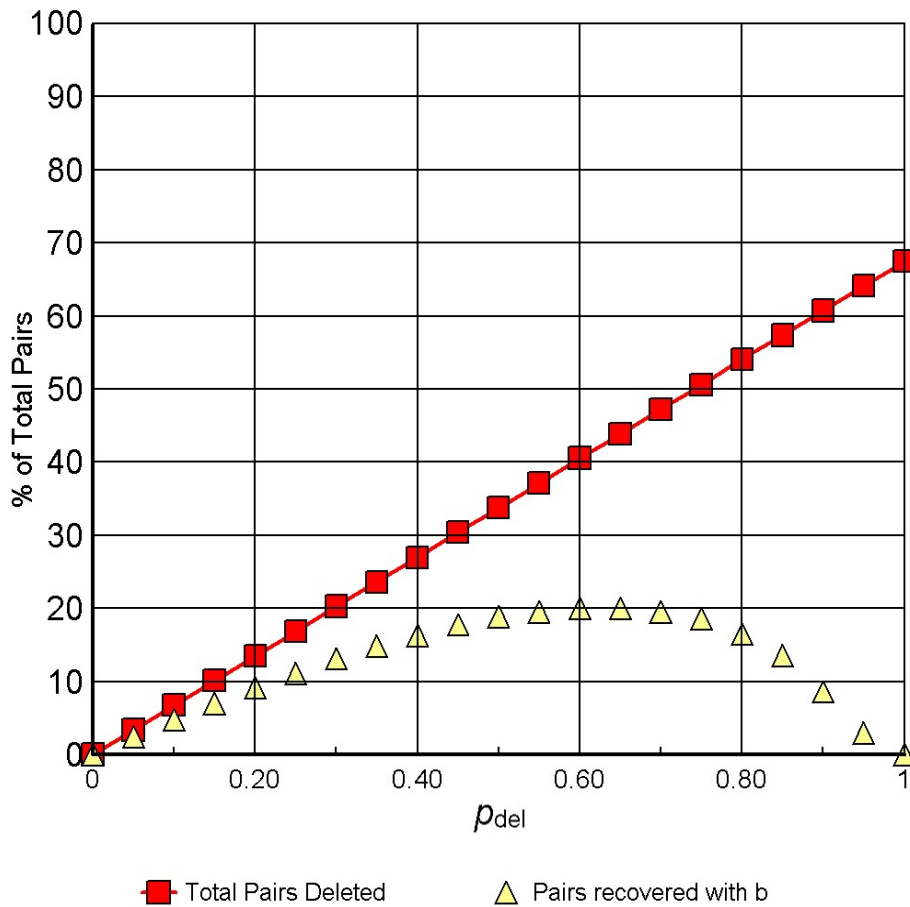


Figure 16: The horizontal axis represents the probability of deleting links (from 0 to 1). The vertical axis represents the percentage of total links deleted (red squares) and the percentage of total links recovered with the b parameter (yellow triangles) from the semi-metric analysis.

Given that $\mathbf{PDP1}^{\text{TC}}$ is a similarity graph, there is no semi-metric behavior for $p_{\text{del}} = 0$. Furthermore, since in this case we are completely deleting links, the s and rs semi-metric parameters are null for all pairs, and all values of p_{del} , as these parameters need a positive direct proximity value between a semi-metric pair to identify it as semi-metric. This is not the case of the b parameter which picks up pairs with no direct proximity values. The percentage of total pairs with $b > 1$, and its standard deviation, are shown in columns 4 and 5. Figure 16 depicts the values of actual deleted pairs and those recovered with b against different values of p_{del} .

We can see that for p_{del} up to 0.2, the semi-metric analysis is able to recover most deletions. As random deletions increase, the ability to recover deleted links decreases. In any case, as we can see in Figure 16, when $p_{\text{del}} = 0.6$, the semi-metric analysis is still capable of recovering half of all deleted links.

This shows that the semi-metric methodology is able to recover deleted links (or incomplete knowledge), but we still need to know how much the value of parameter b is an indication of the strength of the original deleted link. In other words, we want to know if a large value of b tends to imply a large deleted proximity. To measure the validity of this implication, we also computed the linear correlation coefficient between the value of b and the variation in deleted proximity, $\Delta PDP = pdp_{ij}(\text{initial}) - pdp_{ij}(\text{deleted})$ for deleted links – where $pdp_{ij} = \mathbf{PDP}(p_i, p_j)$, the value of proximity

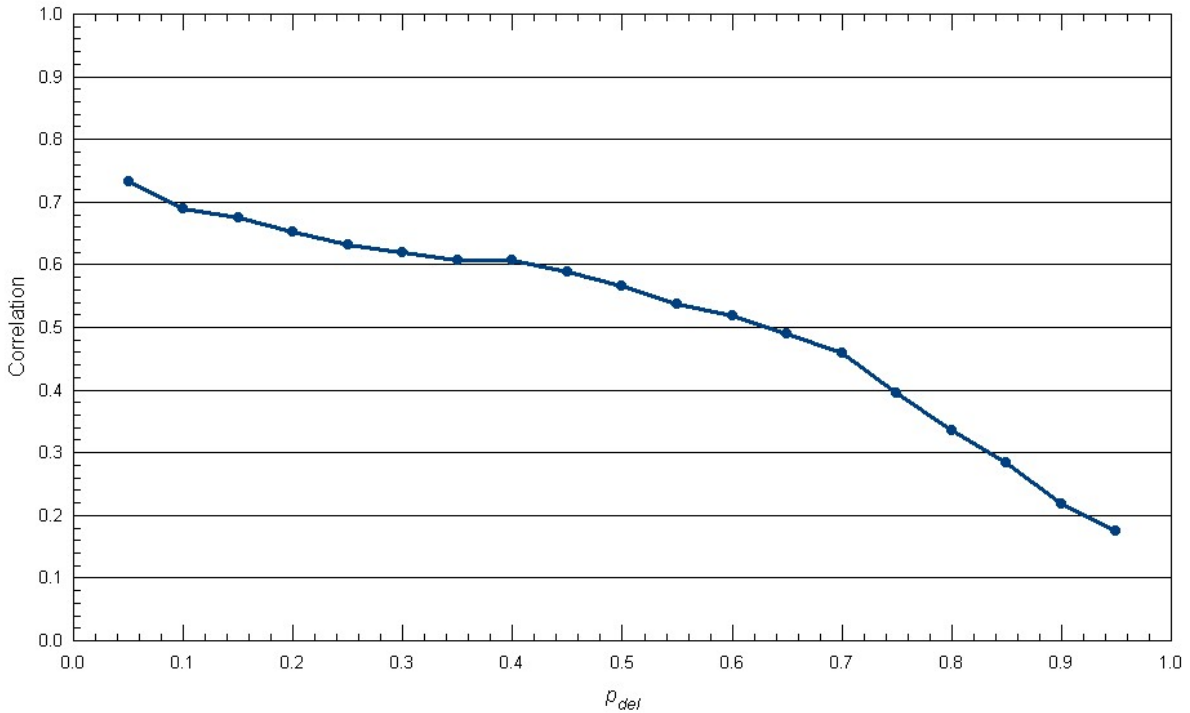


Figure 17: Plot of linear correlation between b and ΔPDP against p_{del}

for link (p_i, p_j) . In this case, pdp_{ij} (deleted) = 0. The value of this linear correlation and its standard deviation are shown in columns 6 and 7.

Figure 17 plots this linear correlation against the probability of deleting links, p_{del} . We can see that there is a distinct correlation for the initial values of random deletions. Until $p_{del} = 0.4$, this correlation is over 0.6. After this level of deletions the correlation decreases more rapidly. Thus, parameter b is a good measure of deleted links in **PDP1^{TC}** – it is able to recover deleted pairs, and its value is well correlated with the deleted value. This is a strong result for the validity of this methodology when used to discover missing evidence or knowledge.

We also conducted this random deletion analysis for the case of partial random deletion. That is, instead of completely deleting a link between a pair of elements, we reduce its value. Specifically, the process is exactly the same as above, but instead of pdp_{ij} (deleted) = 0, we have pdp_{ij} (deleted) = pdp_{ij} (initial) * u , where u is a uniform random variable in $[0, 1]$. Table 3 shows the results for this case. Since the deletions are partial, the s parameter detects partially deleted links – in addition to the b parameter which also detects deleted links.

Table 3: Results of Partial Random Deletions of **PDP1^{TC}**

p_del	%Total Pairs Deleted	stdv	%s	stdv	%b	stdv	Corr_s	stdv	Corr_b	stdv
0	0	0	0	0	0	0	----	----	----	----
0.05	3.346	0.188	3.081	0.1764	2.188	0.1297	0.18	0.0709	0.623	0.113
0.1	6.768	0.2314	6.201	0.2225	4.138	0.1582	0.164	0.0495	0.631	0.085
0.15	10.124	0.2653	9.212	0.2683	5.684	0.2065	0.153	0.032	0.625	0.081
0.2	13.548	0.3275	12.249	0.3216	7.068	0.2223	0.165	0.0454	0.628	0.074
0.25	16.827	0.358	15.127	0.3157	8.214	0.2833	0.158	0.0468	0.606	0.089
0.3	20.251	0.3868	18.095	0.3625	9.33	0.2802	0.165	0.05	0.623	0.075
0.35	23.599	0.3934	20.923	0.3696	10.186	0.3193	0.15	0.045	0.602	0.07
0.4	26.983	0.4196	23.781	0.4253	10.933	0.3439	0.153	0.0309	0.62	0.063
0.45	30.411	0.4081	26.582	0.3649	11.563	0.3657	0.167	0.0445	0.625	0.08
0.5	33.776	0.4034	29.245	0.4151	12.225	0.3842	0.148	0.0322	0.628	0.06
0.55	37.139	0.3499	31.782	0.4	12.55	0.4713	0.156	0.033	0.617	0.09
0.6	40.474	0.3938	34.179	0.4543	13.046	0.427	0.166	0.0456	0.607	0.08
0.65	43.886	0.3999	36.615	0.447	13.408	0.3969	0.159	0.0354	0.606	0.075
0.7	47.24	0.3499	38.834	0.4141	13.717	0.4681	0.161	0.038	0.584	0.08
0.75	50.645	0.3421	40.956	0.3994	13.991	0.4802	0.166	0.0465	0.584	0.091
0.8	54.004	0.3224	42.897	0.4557	14.162	0.4922	0.172	0.049	0.558	0.082
0.85	57.376	0.2555	44.529	0.4782	14.307	0.5396	0.161	0.0394	0.548	0.099
0.9	60.78	0.2221	45.961	0.4919	14.435	0.4947	0.157	0.0405	0.546	0.079
0.95	64.169	0.1624	46.886	0.4511	14.487	0.5588	0.147	0.0313	0.531	0.071
1	67.5	0	47.112	0.5206	14.74	0.5674	0.139	0.0319	0.498	0.063

Figure 18 depicts the percentage of total pairs deleted and those recovered with parameter s and b against the various levels of link deletions. The s parameter is very good at recovering most of the

partially deleted links; even at high levels of deletion a large percentage of partially deleted links are identified. For instance, at $p_{del} = 0.7$, more than 80% of deleted links are identified. The b parameter does not do as well in the partial deletion case, but that is to be expected since it was developed to capture completely missing data.

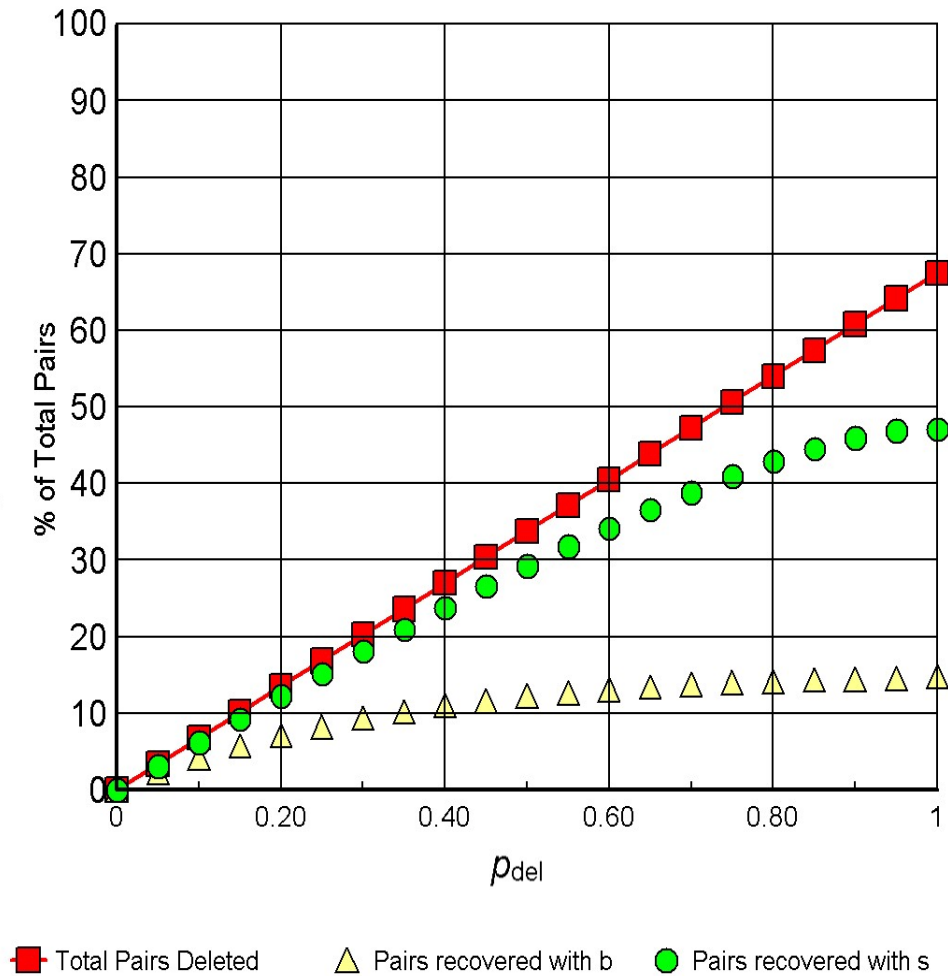


Figure 18: The horizontal axis represents the percentage of deleted positive links (from 0 to 100 %). The vertical axis represents the percentage of total links deleted (red squares), the percentage of total links recovered with the s parameter (green circles), and the percentage of total links recovered with the b parameter (yellow triangles) from the semi-metric analysis.

However, as it can be seen in table 3 and Figure 19, the value of s is not as correlated with ΔPDP as b is. In other words, even though the s parameter identifies most partially deleted links, it is not a very good measure of the amount of deleted information. The b parameter remains a good measure of the amount of information deleted for the smaller set of deleted links it identifies. This leads us

to posit that the s parameter (and the related rs) needs to be fine-tuned. In particular, one avenue for this development might be to tie it to the average distance of each node in a graph, as the b parameter is, but this is left for future work.

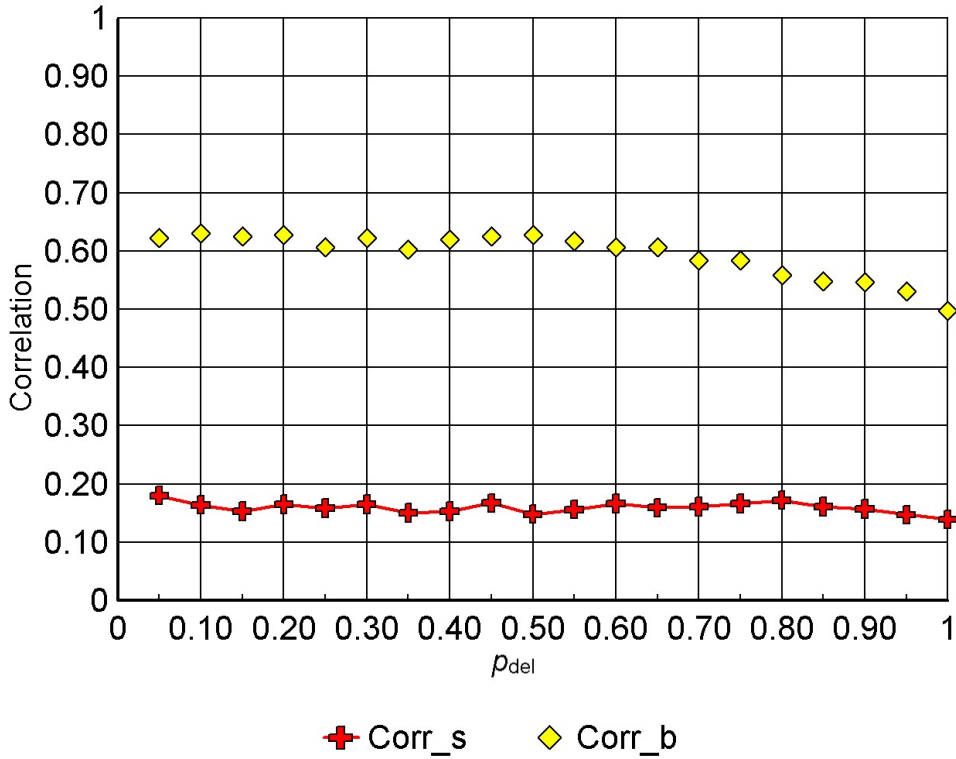


Figure 19: Correlation of s and b with ΔPDP for random partial deletion in $PDP1^{TC}$.

We computed the same random deletion scheme for $PDP2^{TC}$. As it can be seen in the appropriate tables and figures below, the semi-metric methodology was even slightly better for this case than $PDP1^{TC}$. The parameter b is able to recover slightly more completely deleted pairs and is slightly more correlated with the amount deleted. The same applies to parameter s in the partial random deletions case.

Table 4: Full Random Deletions for PDP2^{TC}

p_del	%Total Pairs Deleted	stdv	%b	stdv	Corr	stdv
0	0	0	0	0	----	----
0.05	3.891	0.081	3.266	0.0836	0.767	0.042
0.1	7.801	0.122	6.441	0.1231	0.727	0.059
0.15	11.646	0.117	9.542	0.1316	0.71	0.05
0.2	15.525	0.149	12.467	0.1641	0.688	0.065
0.25	19.382	0.152	15.256	0.3268	0.657	0.068
0.3	23.222	0.169	17.827	0.2872	0.67	0.049
0.35	27.066	0.178	20.394	0.3565	0.645	0.055
0.4	31.012	0.197	22.654	0.4773	0.646	0.044
0.45	34.869	0.11	24.55	0.4683	0.625	0.047
0.5	38.759	0.159	26.43	0.5465	0.601	0.045
0.55	42.618	0.233	27.604	0.5375	0.585	0.034
0.6	46.515	0.236	28.81	0.7643	0.561	0.048
0.65	50.353	0.169	29.045	1.1279	0.551	0.035
0.7	54.183	0.243	29.312	0.6044	0.51	0.039
0.75	58.061	0.129	28.311	0.7839	0.478	0.035
0.8	61.97	0.103	26.525	0.7654	0.443	0.029
0.85	65.872	0.122	23.385	1.0253	0.382	0.029
0.9	69.787	0.119	18.26	1.1305	0.307	0.034
0.95	73.684	0.1	8.647	1.2792	0.198	0.048
1	77.531	0	0	0	---	---

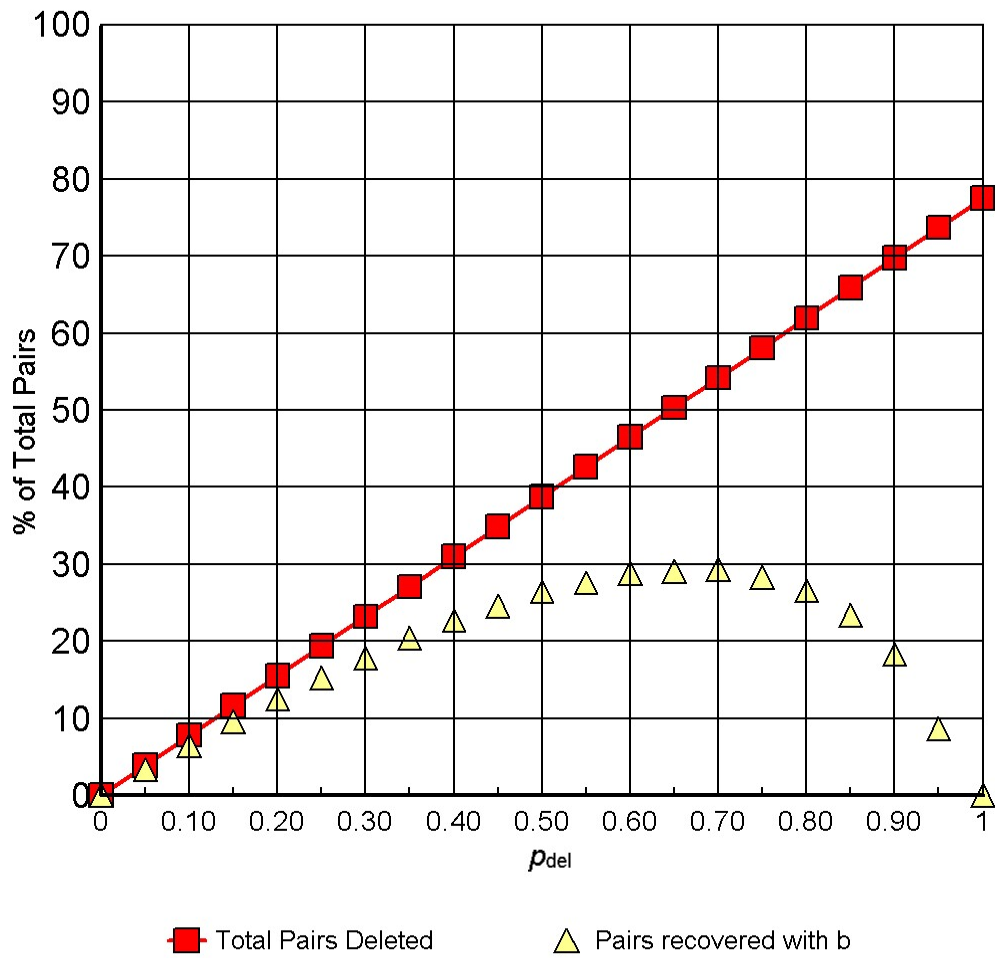


Figure 20: Percentage of total links deleted and recovered with parameter b for PDP2^{TC} in full deletion case

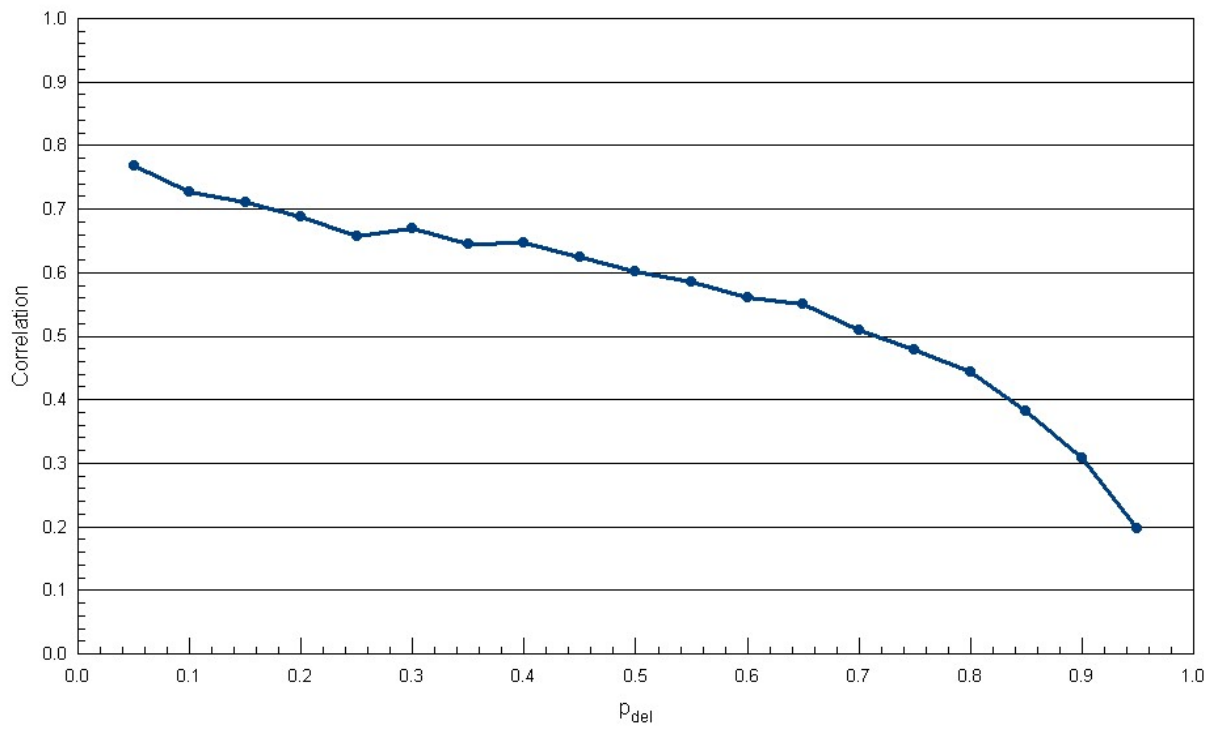


Figure 21: Correlation of deleted proximity with value of parameter b in PDP2^{TC} for full deletion

Table 5: Partial Random Deletions for PDP2^{TC}

p_del	%Total Pairs Deleted	stdv	%s	stdv	%b	stdv	Corr_s	stdv	Corr_b	stdv
0	0	0	0	0	0	0	----	----	----	----
0.05	3.86	0.0693	3.624	0.0688	2.543	0.048	0.194	0.0425	0.658	0.043
0.1	7.766	0.1331	7.224	0.1208	4.574	0.0843	0.191	0.0374	0.654	0.059
0.15	11.589	0.1083	10.752	0.1093	6.105	0.0918	0.184	0.0162	0.657	0.072
0.2	15.556	0.1264	14.37	0.1471	7.41	0.1238	0.182	0.0172	0.668	0.069
0.25	19.39	0.1426	17.77	0.1436	8.508	0.0802	0.171	0.0181	0.681	0.02
0.3	23.23	0.1714	21.196	0.1679	9.397	0.1479	0.178	0.0156	0.668	0.109
0.35	27.085	0.1436	24.548	0.1543	10.251	0.1425	0.172	0.0143	0.693	0.028
0.4	31.029	0.2083	27.918	0.1702	10.967	0.1515	0.177	0.0147	0.694	0.042
0.45	34.918	0.1907	31.142	0.2438	11.499	0.217	0.175	0.0138	0.663	0.138
0.5	38.817	0.1938	34.388	0.2259	11.92	0.1301	0.165	0.012	0.689	0.094
0.55	42.646	0.1643	37.466	0.2678	12.436	0.1887	0.173	0.0159	0.626	0.189
0.6	46.448	0.1697	40.407	0.3323	12.822	0.178	0.169	0.0138	0.734	0.017
0.65	50.314	0.2213	43.204	0.3095	13.237	0.271	0.172	0.0102	0.691	0.103
0.7	54.228	0.1488	45.821	0.2937	13.64	0.185	0.187	0.0157	0.644	0.143
0.75	58.131	0.1446	48.325	0.3296	13.882	0.2395	0.175	0.0122	0.687	0.116
0.8	62.071	0.1517	50.767	0.3356	14.269	0.2297	0.18	0.0194	0.72	0.049
0.85	65.958	0.1219	52.856	0.388	14.455	0.3335	0.174	0.0125	0.658	0.126
0.9	69.783	0.1221	54.585	0.3235	14.754	0.1959	0.168	0.0124	0.705	0.079
0.95	73.614	0.0909	55.639	0.3607	14.918	0.2512	0.156	0.015	0.677	0.16
1	77.531	0	56.051	0.2569	14.999	0.2538	0.154	0.0073	0.733	0.033

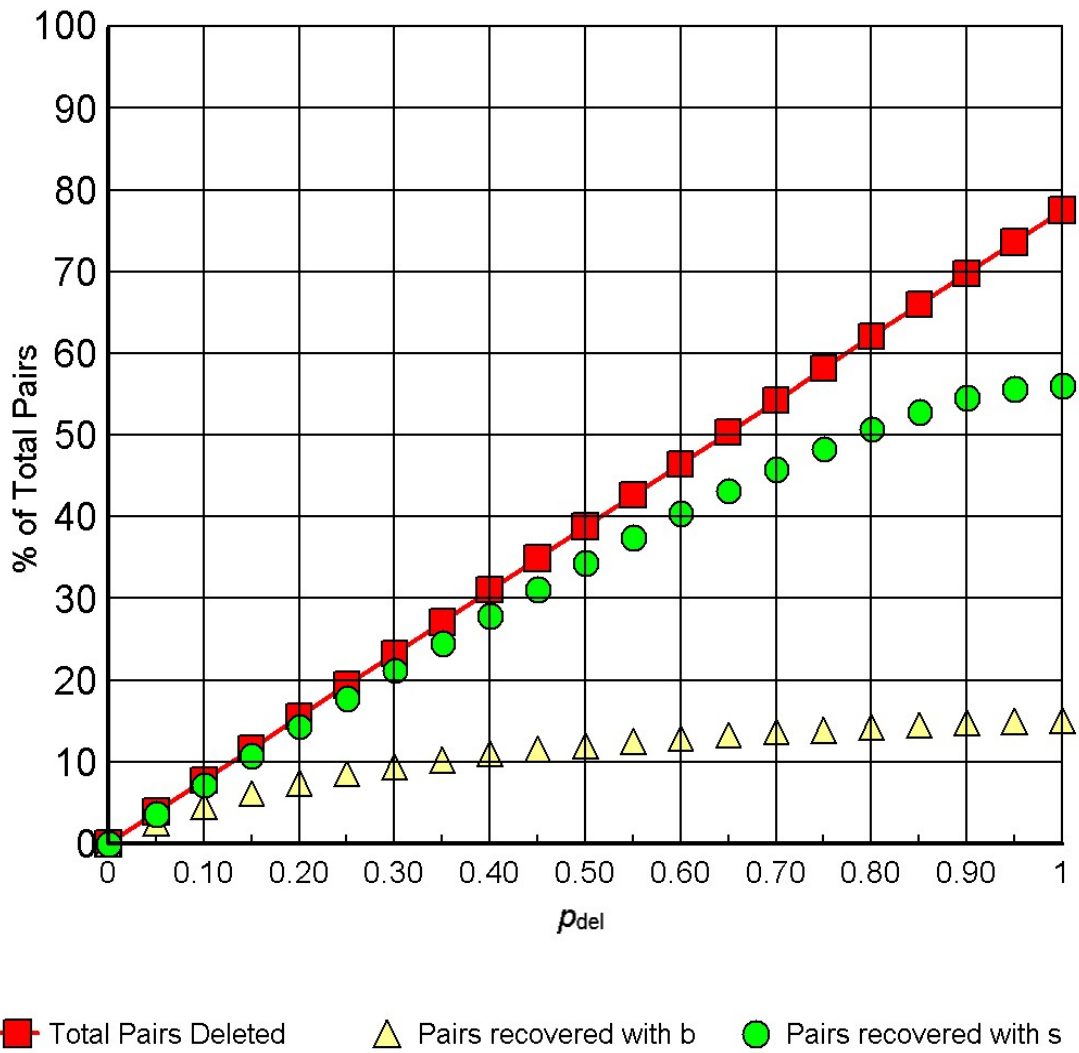


Figure 22: Percentage of deleted links, percentage of links recovered with parameter s and percentage of links recovered with parameter b for partial random deletion in $PDP2^{TC}$

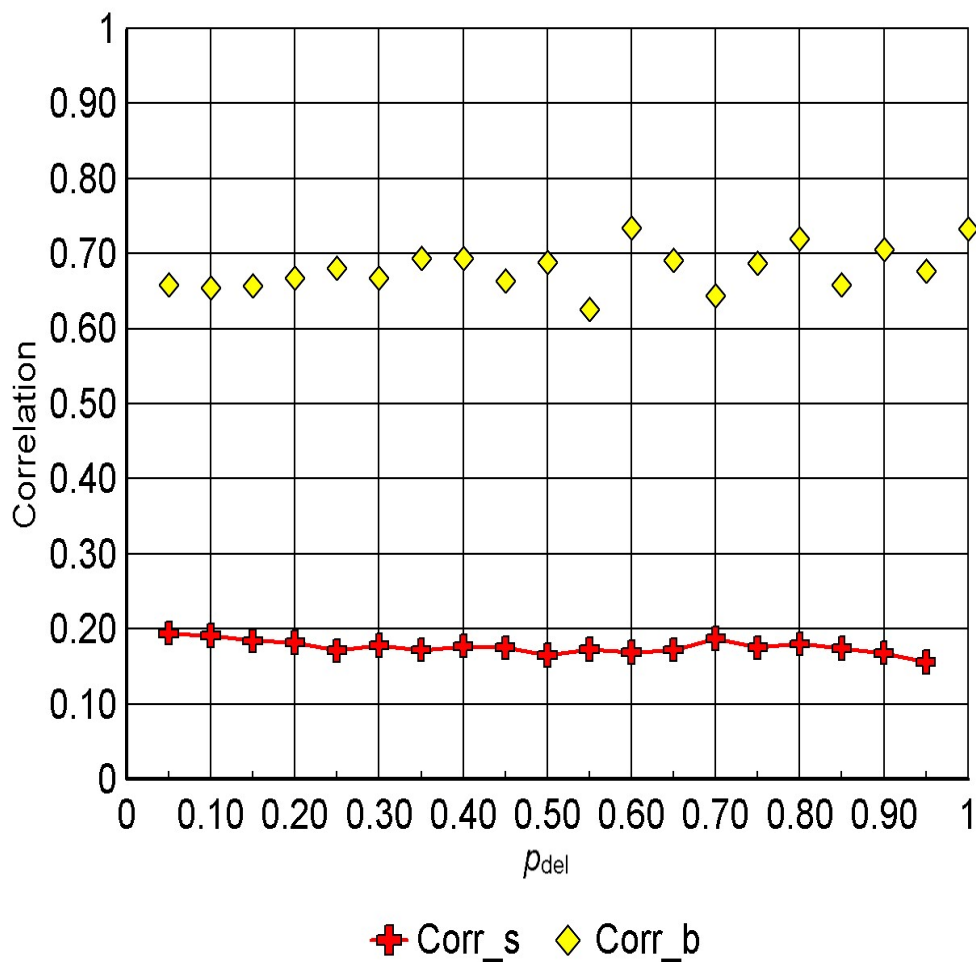


Figure 23: Correlation of parameters s and b with partially deleted proximity values in $PDP2^{TC}$

Finally, we note that we also computed this random deletion scheme for several random proximity graphs, and we observed that the semi-metric methodology is not able to recover deleted links well at all in such a case. This implies that this methodology is applicable to graphs that represent some real knowledge. We will leave the investigation of this conjecture for future work.

7 CONCLUSIONS AND FUTURE WORK

The proximity graphs we produced capture the direct associations between elements of a database field according to another field, e.g. co-occurrence of people names in documents. This provides a network representation of elements stored in a database, and allows us to discern what are the pairs of elements most associated with one another.

The semi-metric analysis adds to this the capacity to uncover latent associations between elements. That is, associations for which we do not possess direct evidence, but which are implied by the overall proximity network. The random deletion tests computed to test this methodology indicate that it is indeed successful at uncovering missing knowledge.

Several avenues of development remain for both proximity graphs and their semi-metric analysis, some of which are outlined below:

- Proximity graphs, mathematically are fuzzy graphs. As such, we can manipulate them with Fuzzy Set operations. For instance, we can calculate the unions and intersections of proximity graphs defined on the same set of elements. As an example, we can compute the intersection of **PDP2** with **PGP**, which would yield the proximity between people names according to co-occurrence in documents and participation in groups. A tool capable of manipulating these graphs in such a manner could be a useful analysis tool.
- The NETSTAT software could be developed as a database analysis tool, providing more effective visualization of graphs, as well as the ability to click on links to obtain the relevant evidence. For instance, clicking on a link between a pair of names in the **PDP2** graph would return the documents where the pair co-occurs.
- Improvement of the semi-metric parameters and better visualization techniques for this methodology.
- Integration of lattice visualization with proximity graphs.

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APPENDIX A - PROXIMITY DATA

A1. Pairs of names with PDP1 ≥ 3

Percentage of Total: 1.1398 %

Number of Pairs: 119

- 1: Shaykh Ahme Nur Jimale, Youssef Nada
- 1: Shamil Basayev, Uvais Akhmadov
- 1: Sami Essid Ben Khemais, Tarek Chaarabi
- 1: Sa'id Amin, Salah Hajir
- 1: Ruhul Ahmed, Shafiq Rasul
- 1: Rifa'i Taha Musa, Sayyid Qutb
- 1: Ramzi Ibn-al-Shaiba, Salah Hajir
- 1: Ramzi Ibn-al-Shaiba, Sa'id Amin
- 1: Muhammed Ali Mukhtar, Suleiman Asad
- 1: Muhammad Salah, Tariq Anwar
- 1: Muhammad Sa'id Ali Hasan, Ramzi Binalshibh
- 1: Movladi Udugov, Wahhabi Achimez Gochiyayev
- 1: Mohamed Aouadi, Tarek Chaarabi
- 1: Mohamed Aouadi, Sami Essid Ben Khemais
- 1: Latif Mansour, Saif Rahman
- 1: Khizir Alkhazurov, Uvais Akhmadov
- 1: Khizir Alkhazurov, Shamil Basayev
- 1: Khalid Ibn Muhammad Al-Juhani, Ramzi Binalshibh
- 1: Khalid Ibn Muhammad Al-Juhani, Muhammad Sa'id Ali Hasan
- 1: Khalfan Khamis Mohamed, Mohamed Rashed Daoud Owahli
- 1: Hector Janjalani, Khadafy Janjalani
- 1: Habib Abd al-Rahman, Uvais Akhmadov
- 1: Habib Abd al-Rahman, Shamil Basayev
- 1: Habib Abd al-Rahman, Khizir Alkhazurov
- 1: Fawaz Yahya Al-Rabeei, Mustafa Abdulkader Aabed al-Ansari
- 1: Faker Boussora, Ramzi Binalshibh
- 1: Faker Boussora, Muhammad Sa'id Ali Hasan
- 1: Faker Boussora, Khalid Ibn Muhammad Al-Juhani
- 1: Faizal Khan Gulam Sarwar, Mohd Agus Ahmad Selani.
- 1: Faiz Abu Bakar Bafana, Mohamad Khalim bin Jaffar
- 1: Bouraoui El-Ouaer, Mohamed Sliti
- 1: Asif Iqbal, Shafiq Rasul
- 1: Asif Iqbal, Ruhul Ahmed
- 1: Ali Qaed Senyan al-Harthi, Mohammed Hamdi al-Ahdal
- 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Ramzi Binalshibh
- 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Muhammad Sa'id Ali Hasan
- 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Khalid Ibn Muhammad Al-Juhani
- 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Faker Boussora
- 1: Abu Sabaya, Khadafy Janjalani
- 1: Abu Sabaya, Hector Janjalani
- 1: Abdul Rehman Zahid, Noor Mohammad Saqib
- 1: Abdelsattar Dahmane, Mohamed Sliti
- 1: Abdelsattar Dahmane, Bouraoui El-Ouaer
- 1: Abdallah al-Shafi, Salah Hajir

1: Abdallah al-Shafi, Sa'id Amin
 1: Abdallah al-Shafi, Ramzi Ibn-al-Shaiba
 1: Abd Al-Rahim, Ramzi Binalshibh
 1: Abd Al-Rahim, Muhammad Sa'id Ali Hasan
 1: Abd Al-Rahim, Khalid Ibn Muhammad Al-Juhani
 1: Abd Al-Rahim, Faker Boussora
 1: Abd Al-Rahim, Al Rauf Bin Al Habib Bin Yousef Al-Jiddi
 0.83: Bashir-ud-Din Mahmood, Abdul Majid
 0.75: Amer Kamfar, Waleed M. Alshehri
 0.67: Shafiq Rasul, Munir Ali
 0.67: Ruhai Ahmed, Munir Ali
 0.67: Asif Iqbal, Munir Ali
 0.67: Adnan Bukhari, Amer Kamfar
 0.6: Victor Bout, Sanjivan Ruprah
 0.59: Mohammed Atta, Marwan Al-Shehhi
 0.5: Youssef Nada, Yasin al-Qadi
 0.5: Yazid Sufaat, Albader Alhazmi
 0.5: Yasir al-Sirri, Yacine Aknouche
 0.5: Wadih Hage, Mohamed Rashed Daoud Owhali
 0.5: Wadih Hage, Khalfan Khamis Mohamed
 0.5: Tarek Maaroufi, Tarek Chaarabi
 0.5: Tarek Maaroufi, Sami Essid Ben Khemais
 0.5: Tarek Maaroufi, Mohamed Sliti
 0.5: Tarek Maaroufi, Mohamed Aouadi
 0.5: Tarek Maaroufi, Bouraoui El-Ouaer
 0.5: Tarek Maaroufi, Abdelsattar Dahmane
 0.5: Sulaiman Abu Ghaith, Riduan Isamuddin
 0.5: Shaykh Ahme Nur Jimale, Yasin al-Qadi
 0.5: Sameer Mohammed Ahmed al-Hada, Mustafa Abdulkader Aabed al-Ansari
 0.5: Sameer Mohammed Ahmed al-Hada, Fawaz Yahya Al-Rabeei
 0.5: Osama Rushdi, Sayyid Qutb
 0.5: Osama Rushdi, Rifa'i Taha Musa
 0.5: Munir Ali, Jamal Udeen
 0.5: Mohammed Saddiq Odeh, Mohamed Rashed Daoud Owhali
 0.5: Mohammed Saddiq Odeh, Khalfan Khamis Mohamed
 0.5: Mohammed bin Laden, Riduan Isamuddin
 0.5: Khalid Almihdhar, Nawaf Alhazmi
 0.5: John Walker Lindh, Mustafa Abdulkader Aabed al-Ansari
 0.5: John Walker Lindh, Fawaz Yahya Al-Rabeei
 0.5: Feroz Abassi, Jamal Udeen
 0.5: Ameer Bukhari, Mohand Alshehri
 0.5: Ahmad Ibrahim Ali al-Hazzouni, Wail M. Alshehri
 0.5: Ahmad Ibrahim Ali al-Hazzouni, Mohand Alshehri
 0.5: Adnan Bukhari, Waleed M. Alshehri
 0.4: Sheikh Omar Abd al-Rahman, Refaei Ahmed Taha
 0.4: Abu Qatada, Omar Bakri Mohammed
 0.38: Ahmed Ressay, Mokhtar Haouari
 0.36: Hani Hanjour, Faisal Al Salmi
 0.33: Yasir al-Sirri, Anas al-Liby
 0.33: Waleed M. Alshehri, Mohand Alshehri
 0.33: Wadih Hage, Khalil al-Dik
 0.33: Shafiq Rasul, Jamal Udeen

0.33: Sanjivan Ruprah, Charles Taylor
 0.33: Ruhai Ahmed, Jamal Udeen
 0.33: Refaei Ahmed Taha, Sayyid Qutb
 0.33: Refaei Ahmed Taha, Rifa'i Taha Musa
 0.33: Mohammed Saddiq Odeh, Wadih Hage
 0.33: Mohammed bin Laden, Sulaiman Abu Ghaith
 0.33: Mohamad Khalim bin Jaffar, Mohd Agus Ahmad Selani.
 0.33: Mohamad Khalim bin Jaffar, Faizal Khan Gulam Sarwar
 0.33: John Walker Lindh, Sameer Mohammed Ahmed al-Hada
 0.33: Haydar Abu Doha, Redouane Dahmani
 0.33: Hani Hanjour, Lotfi Raissi
 0.33: Feroz Abassi, Munir Ali
 0.33: Faiz Abu Bakar Bafana, Mohd Agus Ahmad Selani.
 0.33: Faiz Abu Bakar Bafana, Faizal Khan Gulam Sarwar
 0.33: Asif Iqbal, Jamal Udeen
 0.33: Ahmad Ibrahim Ali al-Hazzouni, Ameer Bukhari
 0.33: Adnan Bukhari, Ameer Bukhari
 0.33: Abdurajak Janjalani, Khadafy Janjalani
 0.33: Abdurajak Janjalani, Hector Janjalani
 0.33: Abdurajak Janjalani, Abu Sabaya
 0.33: Abdullah Ahmed Abdullah, Mohammed Saddiq Odeh
 0.33: Abdulaziz Alomari, Amer Kamfar
 0.33: Abdel Raouf Hawas, Shamim Sarwar

A2. Pairs of names with Transitive Closure of PDP1 ≥ 3

Percentage of Total: 1.5613 %

Number of Pairs: 163

1: Shaykh Ahme Nur Jimale, Youssef Nada
 1: Shamil Basayev, Uvais Akhmadov
 1: Sami Essid Ben Khemais, Tarek Chaarabi
 1: Sa'id Amin, Salah Hajir
 1: Ruhai Ahmed, Shafiq Rasul
 1: Rifa'i Taha Musa, Sayyid Qutb
 1: Ramzi Ibn-al-Shaiba, Salah Hajir
 1: Ramzi Ibn-al-Shaiba, Sa'id Amin
 1: Muhammed Ali Mukhtar, Suleiman Asad
 1: Muhammad Salah, Tariq Anwar
 1: Muhammad Sa'id Ali Hasan, Ramzi Binalshibh
 1: Movladi Udugov, Wahhabi Achimez Gochiyayev
 1: Mohamed Aouadi, Tarek Chaarabi
 1: Mohamed Aouadi, Sami Essid Ben Khemais
 1: Latif Mansour, Saif Rahman
 1: Khizir Alkhazurov, Uvais Akhmadov
 1: Khizir Alkhazurov, Shamil Basayev
 1: Khalid Ibn Muhammad Al-Juhani, Ramzi Binalshibh
 1: Khalid Ibn Muhammad Al-Juhani, Muhammad Sa'id Ali Hasan
 1: Khalfan Khamis Mohamed, Mohamed Rashed Daoud Owahli
 1: Hector Janjalani, Khadafy Janjalani
 1: Habib Abd al-Rahman, Uvais Akhmadov
 1: Habib Abd al-Rahman, Shamil Basayev
 1: Habib Abd al-Rahman, Khizir Alkhazurov

1: Fawaz Yahya Al-Rabeei, Mustafa Abdulkader Aabed al-Ansari
 1: Faker Boussora, Ramzi Binalshibh
 1: Faker Boussora, Muhammad Sa'id Ali Hasan
 1: Faker Boussora, Khalid Ibn Muhammad Al-Juhani
 1: Faizal Khan Gulam Sarwar, Mohd Agus Ahmad Selani.
 1: Faiz Abu Bakar Bafana, Mohamad Khalim bin Jaffar
 1: Bouraoui El-Ouaer, Mohamed Sliti
 1: Asif Iqbal, Shafiq Rasul
 1: Asif Iqbal, Ruhai Ahmed
 1: Ali Qaed Senyan al-Harhi, Mohammed Hamdi al-Ahdal
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Ramzi Binalshibh
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Muhammad Sa'id Ali Hasan
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Khalid Ibn Muhammad Al-Juhani
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Faker Boussora
 1: Abu Sabaya, Khadafy Janjalani
 1: Abu Sabaya, Hector Janjalani
 1: Abdul Rehman Zahid, Noor Mohammad Saqib
 1: Abdelsattar Dahmane, Mohamed Sliti
 1: Abdelsattar Dahmane, Bouraoui El-Ouaer
 1: Abdallah al-Shafi, Salah Hajir
 1: Abdallah al-Shafi, Sa'id Amin
 1: Abdallah al-Shafi, Ramzi Ibn-al-Shaiba
 1: Abd Al-Rahim, Ramzi Binalshibh
 1: Abd Al-Rahim, Muhammad Sa'id Ali Hasan
 1: Abd Al-Rahim, Khalid Ibn Muhammad Al-Juhani
 1: Abd Al-Rahim, Faker Boussora
 1: Abd Al-Rahim, Al Rauf Bin Al Habib Bin Yousef Al-Jiddi
 0.83: Bashir-ud-Din Mahmood, Abdul Majid
 0.75: Amer Kamfar, Waleed M. Alshehri
 0.67: Shafiq Rasul, Munir Ali
 0.67: Ruhai Ahmed, Munir Ali
 0.67: Asif Iqbal, Munir Ali
 0.67: Adnan Bukhari, Waleed M. Alshehri
 0.67: Adnan Bukhari, Amer Kamfar
 0.6: Victor Bout, Sanjivan Ruprah
 0.59: Mohammed Atta, Marwan Al-Shehhi
 0.5: Youssef Nada, Yasin al-Qadi
 0.5: Yazid Sufaat, Albader Alhazmi
 0.5: Yasir al-Sirri, Yacine Aknouche
 0.5: Wail M. Alshehri, Mohand Alshehri
 0.5: Wadih Hage, Mohamed Rashed Daoud Owhali
 0.5: Wadih Hage, Khalfan Khamis Mohamed
 0.5: Tarek Maaroufi, Tarek Chaarabi
 0.5: Tarek Maaroufi, Sami Essid Ben Khemais
 0.5: Tarek Maaroufi, Mohamed Sliti
 0.5: Tarek Maaroufi, Mohamed Aouadi
 0.5: Tarek Maaroufi, Bouraoui El-Ouaer
 0.5: Tarek Maaroufi, Abdelsattar Dahmane
 0.5: Tarek Chaarabi, Mohamed Sliti
 0.5: Tarek Chaarabi, Bouraoui El-Ouaer
 0.5: Tarek Chaarabi, Abdelsattar Dahmane
 0.5: Sulaiman Abu Ghaith, Riduan Isamuddin

0.5: Shaykh Ahme Nur Jimale, Yasin al-Qadi
 0.5: Shafiq Rasul, Jamal Udeen
 0.5: Shafiq Rasul, Feroz Abassi
 0.5: Sami Essid Ben Khemais, Mohamed Sliti
 0.5: Sami Essid Ben Khemais, Bouraoui El-Ouaer
 0.5: Sami Essid Ben Khemais, Abdelsattar Dahmane
 0.5: Sameer Mohammed Ahmed al-Hada, Mustafa Abdulkader Aabed al-Ansari
 0.5: Sameer Mohammed Ahmed al-Hada, Fawaz Yahya Al-Rabeei
 0.5: Ruhul Ahmed, Jamal Udeen
 0.5: Ruhul Ahmed, Feroz Abassi
 0.5: Osama Rushdi, Sayyid Qutb
 0.5: Osama Rushdi, Rifa'i Taha Musa
 0.5: Munir Ali, Jamal Udeen
 0.5: Mohammed Saddiq Odeh, Wadih Hage
 0.5: Mohammed Saddiq Odeh, Mohamed Rashed Daoud Owhali
 0.5: Mohammed Saddiq Odeh, Khalfan Khamis Mohamed
 0.5: Mohammed bin Laden, Sulaiman Abu Ghaith
 0.5: Mohammed bin Laden, Riduan Isamuddin
 0.5: Mohamed Aouadi, Mohamed Sliti
 0.5: Mohamed Aouadi, Bouraoui El-Ouaer
 0.5: Mohamed Aouadi, Abdelsattar Dahmane
 0.5: Khalid Almihdhar, Nawaf Alhazmi
 0.5: John Walker Lindh, Sameer Mohammed Ahmed al-Hada
 0.5: John Walker Lindh, Mustafa Abdulkader Aabed al-Ansari
 0.5: John Walker Lindh, Fawaz Yahya Al-Rabeei
 0.5: Feroz Abassi, Munir Ali
 0.5: Feroz Abassi, Jamal Udeen
 0.5: Asif Iqbal, Jamal Udeen
 0.5: Asif Iqbal, Feroz Abassi
 0.5: Ameer Bukhari, Wail M. Alshehri
 0.5: Ameer Bukhari, Mohand Alshehri
 0.5: Ahmad Ibrahim Ali al-Hazzouni, Wail M. Alshehri
 0.5: Ahmad Ibrahim Ali al-Hazzouni, Mohand Alshehri
 0.5: Ahmad Ibrahim Ali al-Hazzouni, Ameer Bukhari
 0.4: Sheikh Omar Abd al-Rahman, Refaei Ahmed Taha
 0.4: Abu Qatada, Omar Bakri Mohammed
 0.38: Ahmed Ressam, Mokhtar Haouari
 0.36: Hani Hanjour, Faisal Al Salmi
 0.33: Yasir al-Sirri, Anas al-Liby
 0.33: Waleed M. Alshehri, Wail M. Alshehri
 0.33: Waleed M. Alshehri, Mohand Alshehri
 0.33: Waleed M. Alshehri, Ameer Bukhari
 0.33: Waleed M. Alshehri, Ahmad Ibrahim Ali al-Hazzouni
 0.33: Wadih Hage, Khalil al-Dik
 0.33: Victor Bout, Charles Taylor
 0.33: Sheikh Omar Abd al-Rahman, Sayyid Qutb
 0.33: Sheikh Omar Abd al-Rahman, Rifa'i Taha Musa
 0.33: Sheikh Omar Abd al-Rahman, Osama Rushdi
 0.33: Sanjivan Ruprah, Charles Taylor
 0.33: Refaei Ahmed Taha, Sayyid Qutb
 0.33: Refaei Ahmed Taha, Rifa'i Taha Musa
 0.33: Refaei Ahmed Taha, Osama Rushdi

0.33: Mohammed Saddiq Odeh, Khalil al-Dik
0.33: Mohamad Khalim bin Jaffar, Mohd Agus Ahmad Selani.
0.33: Mohamad Khalim bin Jaffar, Faizal Khan Gulam Sarwar
0.33: Lotfi Raissi, Faisal Al Salmi
0.33: Khalil al-Dik, Mohamed Rashed Daoud Owhali
0.33: Khalil al-Dik, Khalfan Khamis Mohamed
0.33: Haydar Abu Doha, Redouane Dahmani
0.33: Hani Hanjour, Lotfi Raissi
0.33: Faiz Abu Bakar Bafana, Mohd Agus Ahmad Selani.
0.33: Faiz Abu Bakar Bafana, Faizal Khan Gulam Sarwar
0.33: Anas al-Liby, Yacine Aknouche
0.33: Amer Kamfar, Wail M. Alshehri
0.33: Amer Kamfar, Mohand Alshehri
0.33: Amer Kamfar, Ameer Bukhari
0.33: Amer Kamfar, Ahmad Ibrahim Ali al-Hazzouni
0.33: Adnan Bukhari, Wail M. Alshehri
0.33: Adnan Bukhari, Mohand Alshehri
0.33: Adnan Bukhari, Ameer Bukhari
0.33: Adnan Bukhari, Ahmad Ibrahim Ali al-Hazzouni
0.33: Adnan Bukhari, Abdulaziz Alomari
0.33: Abdurajak Janjalani, Khadafy Janjalani
0.33: Abdurajak Janjalani, Hector Janjalani
0.33: Abdurajak Janjalani, Abu Sabaya
0.33: Abdullah Ahmed Abdullah, Wadih Hage
0.33: Abdullah Ahmed Abdullah, Mohammed Saddiq Odeh
0.33: Abdullah Ahmed Abdullah, Mohamed Rashed Daoud Owhali
0.33: Abdullah Ahmed Abdullah, Khalil al-Dik
0.33: Abdullah Ahmed Abdullah, Khalfan Khamis Mohamed
0.33: Abdulaziz Alomari, Waleed M. Alshehri
0.33: Abdulaziz Alomari, Wail M. Alshehri
0.33: Abdulaziz Alomari, Mohand Alshehri
0.33: Abdulaziz Alomari, Amer Kamfar
0.33: Abdulaziz Alomari, Ameer Bukhari
0.33: Abdulaziz Alomari, Ahmad Ibrahim Ali al-Hazzouni
0.33: Abdel Raouf Hawas, Shamim Sarwar

A3. Pairs of cities with CDP1 ≥ 3

Percentage of Total: 1.4566 %

Number of Pairs: 52

1: Portland, Vero Beach
1: Khost, Tora Bora
1: Jalalabad, Tora Bora
1: Jalalabad, Khost
1: Hong Kong, Seattle
1: Guantanamo Bay, Manchester
1: Falls Church, Seattle
1: Falls Church, Hong Kong
1: Dushanbe, Bishkek
1: Daytona Beach, Vienna
1: Coral Springs, Vero Beach
1: Coral Springs, Portland

1: Columbus, Seattle
 1: Columbus, Hong Kong
 1: Columbus, Falls Church
 1: Columbus, C“te d'Azur
 1: Ciudad Juarez, Vero Beach
 1: Ciudad Juarez, Portland
 1: Ciudad Juarez, Coral Springs
 1: C“te d'Azur, Seattle
 1: C“te d'Azur, Hong Kong
 1: C“te d'Azur, Falls Church
 0.97: Nairobi, Dar es Salaam
 0.79: Washington D.C., New York City
 0.79: New York City, Shanksville
 0.68: Washington D.C., Shanksville
 0.5: Tipton, Manchester
 0.5: Tipton, Guantanamo Bay
 0.5: Scottsdale, Taif
 0.5: Phoenix, Mesa
 0.5: New Delhi, Dhaka
 0.5: Minneapolis, Seattle
 0.5: Minneapolis, Hong Kong
 0.5: Minneapolis, Falls Church
 0.5: Minneapolis, Columbus
 0.5: Minneapolis, C“te d'Azur
 0.5: Madrid, Berlin
 0.5: Los Angeles, Montreal
 0.5: Dubai, Seattle
 0.5: Dubai, Khartoum
 0.5: Dubai, Hong Kong
 0.5: Dubai, Falls Church
 0.5: Dubai, Columbus
 0.5: Dubai, C“te d'Azur
 0.5: Boston, Vienna
 0.5: Boston, Daytona Beach
 0.43: Paris, Miami
 0.43: Hamburg, Cairo
 0.4: Rome, Madrid
 0.38: Milan, Rome
 0.33: Strasbourg, Frankfurt
 0.33: Dubai, Minneapolis

A4. Pairs of cities with transitive closure of CDP1 ≥ 3

Percentage of Total: 1.7087 %

Number of Pairs: 61

1: Portland, Vero Beach
 1: Khost, Tora Bora
 1: Jalalabad, Tora Bora
 1: Jalalabad, Khost
 1: Hong Kong, Seattle
 1: Guantanamo Bay, Manchester
 1: Falls Church, Seattle

1: Falls Church, Hong Kong
1: Dushanbe, Bishkek
1: Daytona Beach, Vienna
1: Coral Springs, Vero Beach
1: Coral Springs, Portland
1: Columbus, Seattle
1: Columbus, Hong Kong
1: Columbus, Falls Church
1: Columbus, C“te d'Azur
1: Ciudad Juarez, Vero Beach
1: Ciudad Juarez, Portland
1: Ciudad Juarez, Coral Springs
1: C“te d'Azur, Seattle
1: C“te d'Azur, Hong Kong
1: C“te d'Azur, Falls Church
0.97: Nairobi, Dar es Salaam
0.79: Washington D.C., Shanksville
0.79: Washington D.C., New York City
0.79: New York City, Shanksville
0.5: Tipton, Manchester
0.5: Tipton, Guantanamo Bay
0.5: Seattle, Khartoum
0.5: Scottsdale, Taif
0.5: Phoenix, Mesa
0.5: New Delhi, Dhaka
0.5: Minneapolis, Seattle
0.5: Minneapolis, Khartoum
0.5: Minneapolis, Hong Kong
0.5: Minneapolis, Falls Church
0.5: Minneapolis, Columbus
0.5: Minneapolis, C“te d'Azur
0.5: Madrid, Berlin
0.5: Los Angeles, Montreal
0.5: Hong Kong, Khartoum
0.5: Falls Church, Khartoum
0.5: Dubai, Seattle
0.5: Dubai, Minneapolis
0.5: Dubai, Khartoum
0.5: Dubai, Hong Kong
0.5: Dubai, Falls Church
0.5: Dubai, Columbus
0.5: Dubai, C“te d'Azur
0.5: Columbus, Khartoum
0.5: C“te d'Azur, Khartoum
0.5: Boston, Vienna
0.5: Boston, Daytona Beach
0.43: Paris, Miami
0.43: Hamburg, Cairo
0.4: Rome, Madrid
0.4: Rome, Berlin
0.38: Milan, Rome
0.38: Milan, Madrid

0.38: Milan, Berlin
0.33: Strasbourg, Frankfurt

A5. Pairs of people names with PDP2 ≥ 3

Percentage of Total: 0.6646 %

Number of Pairs: 335

1: Vladimir Putin, George Walker Bush
1: Tyron Santos, Yunus Moklis
1: Tohir Yuldashev, Abdul Akhad
1: Ruhail Ahmed, Shafiq Rasul
1: Redendo Dellosa, Yunus Moklis
1: Redendo Dellosa, Tyron Santos
1: Pio de Vera, Yunus Moklis
1: Pio de Vera, Tyron Santos
1: Pio de Vera, Redendo Dellosa
1: Nabil Nanakli Kosaibati, Nabil Sayadi
1: Mustafa Abdulkader Aabed al-Ansari, Sameer Mohammed Ahmed al-Hada
1: Muhammed Ali Mukhtar, Suleiman Asad
1: Muhammad Shawqi al-Islambuli, Tal'at Fu'ad Qasim
1: Muhammad Hussein Fadhlallah, Muhammad Ubaid
1: Movladi Udugov, Wahhabi Achimez Gochiyayev
1: Mohamed Aouadi, Tarek Chaarabi
1: Mohamad Bahaih, Nabil Sayadi
1: Mohamad Bahaih, Nabil Nanakli Kosaibati
1: Mehdi Khammoun, Moktar Farid-Bouchoucha
1: Marvelo Egil, Yunus Moklis
1: Marvelo Egil, Tyron Santos
1: Marvelo Egil, Redendo Dellosa
1: Marvelo Egil, Pio de Vera
1: Latif Mansour, Saif Rahman
1: Khizir Alkhazurov, Uvais Akhmadov
1: Khalid Ibn Muhammad Al-Juhani, Muhammad Sa'id Ali Hasan
1: Khalid al-Shanqiti, Munir al-Mutasaddiq
1: Junior Jikiron, Ustadz Nur Mohammed Umog
1: Isma'il Shalabi, Tha'ir Mansour
1: Ibrahim Mamdouh Elleban, Mohamed Aouzar
1: Hamed Abderrahman Ahmed, Reswan Abdul Ulsalam
1: Hafiz Mohammed Saeed, Hassan Hattab
1: Habib Abd al-Rahman, Uvais Akhmadov
1: Habib Abd al-Rahman, Khizir Alkhazurov
1: Fouhad Sabour, Salim Boukhari
1: Fazlul Rehman Khalil, Sheikh Mir Hamza
1: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Mohand Alshehri
1: Fawaz Yahya Al-Rabeei, Sameer Mohammed Ahmed al-Hada
1: Fawaz Yahya Al-Rabeei, Mustafa Abdulkader Aabed al-Ansari
1: Farooq Kashmiri, Hassan Hattab
1: Farooq Kashmiri, Hafiz Mohammed Saeed
1: Faker Boussora, Muhammad Sa'id Ali Hasan
1: Faker Boussora, Khalid Ibn Muhammad Al-Juhani
1: Faizal Khan Gulam Sarwar, Mohd Agus Ahmad Selani.
1: Essoussi Laaroussi, Moktar Farid-Bouchoucha

1: Essoussi Laaroussi, Mehdi Khammoun
 1: Bouraoui El-Ouaer, Mohamed Sliti
 1: Asif Iqbal, Shafiq Rasul
 1: Asif Iqbal, Ruhai Ahmed
 1: Angelo Trinidad, Yunus Moklis
 1: Angelo Trinidad, Tyron Santos
 1: Angelo Trinidad, Redendo Dellosa
 1: Angelo Trinidad, Pio de Vera
 1: Angelo Trinidad, Marvelo Egil
 1: Amar Chidek, Jean-Marc Granvisir
 1: Al-Sa'id Ali Hasan Mukhlis, Gueddan Abdel Fatah
 1: Ali Qaed Senyan al-Harhi, Mohammed Hamdi al-Ahdal
 1: Ali al-Rashidi, Tal'at Fu'ad Qasim
 1: Ali al-Rashidi, Muhammad Shawqi al-Islambuli
 1: Alan Borloagdatan, Yunus Moklis
 1: Alan Borloagdatan, Tyron Santos
 1: Alan Borloagdatan, Redendo Dellosa
 1: Alan Borloagdatan, Pio de Vera
 1: Alan Borloagdatan, Marvelo Egil
 1: Alan Borloagdatan, Angelo Trinidad
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Muhammad Sa'id Ali Hasan
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Khalid Ibn Muhammad Al-Juhani
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Faker Boussora
 1: Ahmed Ghailani, Ibrahim Bah
 1: Ahmad Yani, Suri Hanim Mohamad
 1: Ahmad Ibrahim Al-Mughassil, Sheikh Ahmed Salim Swedan
 1: Abu Zaynab, Gushuf
 1: Abu Shala, Gushuf
 1: Abu Shala, Abu Zaynab
 1: Abu Sabaya, Hector Janjalani
 1: Abu Malik, Hiram Torres
 1: Abu Khalid el-Masry, Abu Muaz el-Masry
 1: Abu Hamzu al-Masri, Hassan Hattab
 1: Abu Hamzu al-Masri, Hafiz Mohammed Saeed
 1: Abu Hamzu al-Masri, Farooq Kashmiri
 1: Abu Basir al-Yamani, Hassan Hattab
 1: Abu Basir al-Yamani, Hafiz Mohammed Saeed
 1: Abu Basir al-Yamani, Farooq Kashmiri
 1: Abu Basir al-Yamani, Abu Hamzu al-Masri
 1: Abu Abdulrahman, Reswan Abdul Ulsalam
 1: Abu Abdulrahman, Hamed Abderrahman Ahmed
 1: Abdullah Mohammed, Ibrahim Bah
 1: Abdullah Mohammed, Ahmed Ghailani
 1: Abdul Rehman Zahid, Noor Mohammad Saqib
 1: Abdul Haq, Maulvi Mehmood Din
 1: Abdul Fatath Zammar, Nabil Sayadi
 1: Abdul Fatath Zammar, Nabil Nanakli Kosaibati
 1: Abdul Fatath Zammar, Mohamad Bahaih
 1: Abdelsattar Dahmane, Mohamed Sliti
 1: Abdelsattar Dahmane, Bouraoui El-Ouaer
 1: Abdellah M'Sefer Ali Al Ghamdi, Hilal Jaber Aouad Alassiri
 1: Abdelkader Mahmoud Es Sayed, Ahmed Idris Nasreddin

1: Abdel Ghani Rabia, Jerome Courtailler
 1: Abdalrahman Alarnaot Abu-Aljer, Mohamed Setmariam Nasar
 1: Abdallah al-Shafi, Sa'id Amin
 1: Abd al-Rahim al-Nashiri, Hassan Hattab
 1: Abd al-Rahim al-Nashiri, Hafiz Mohammed Saeed
 1: Abd al-Rahim al-Nashiri, Farooq Kashmiri
 1: Abd al-Rahim al-Nashiri, Abu Hamzu al-Masri
 1: Abd al-Rahim al-Nashiri, Abu Basir al-Yamani
 1: Abbas Harake, Mohamad Hammoud
 0.8571: Khalfan Khamis Mohamed, Mohamed Rashed Daoud Owahli
 0.8: Zuher Hilal Mohamed Al Tbabti, Hilal Jaber Aouad Alassiri
 0.8: Zuher Hilal Mohamed Al Tbabti, Abdellah M'Sefer Ali Al Ghamdi
 0.8: Muhammad Galeb Kalaje, Muhammad Galeb Kalaje Zouaydi
 0.75: Abdullah Yusuf, Abdullah Yusuf Azzam
 0.75: Abdul Majid, Bashir-ud-Din Mahmood
 0.7143: Adnan Bukhari, Amer Kamfar
 0.7: Khalid Almihdhar, Nawaf Alhazmi
 0.6667: Youssef Nada, Shaykh Ahme Nur Jimale
 0.6667: Wadih El-Hage, Hiram Torres
 0.6667: Wadih El-Hage, Abu Malik
 0.6667: Omar Abd al-Rahman, Sheikh Omar Abd al-Rahman
 0.6667: Nizar Trabelsi, Jerome Courtailler
 0.6667: Nizar Trabelsi, Abdel Ghani Rabia
 0.6667: Nizar Ben Mohammed Nawar, Mouhamedou Ould Slehi
 0.6667: Ahmed Alnami, Saeed Alghamdi
 0.6667: Ahmed Alghamdi, Hamza Alghamdi
 0.6667: Ahmad Fadik al Khalalilah, Muhammad Abu Dhess
 0.625: Mohammed Saddiq Odeh, Mohamed Rashed Daoud Owahli
 0.6: Victor Bout, Sanjivan Ruprah
 0.6: Muhammad Galeb Kalaje, Mamoun Darkazanli
 0.6: Christian Manfred G., Nizar Ben Mohammed Nawar
 0.5714: Imad Eddin Barakat, Muhammad Galeb Kalaje
 0.5714: Djamel Beghal, Kamel Daoudi
 0.5556: Mohammed Saddiq Odeh, Khalfan Khamis Mohamed
 0.5: Waleed M. Alshehri, Wail M. Alshehri
 0.5: Ustadz Nur Mohammed Umog, Yunus Moklis
 0.5: Ustadz Nur Mohammed Umog, Tyron Santos
 0.5: Ustadz Nur Mohammed Umog, Redendo Dellosa
 0.5: Ustadz Nur Mohammed Umog, Pio de Vera
 0.5: Ustadz Nur Mohammed Umog, Marvelo Egil
 0.5: Ustadz Nur Mohammed Umog, Angelo Trinidad
 0.5: Ustadz Nur Mohammed Umog, Alan Borloagdatan
 0.5: Ustadz Nur Mohammed Umog, Ahma Aluan
 0.5: Tariq Anwar, Tharwat Shihatah
 0.5: Shaykh Ahme Nur Jimale, Yasin al-Qadi
 0.5: Shamil Basayev, Uvais Akhmadov
 0.5: Shamil Basayev, Tohir Yuldashev
 0.5: Shamil Basayev, Khizir Alkhazurov
 0.5: Shamil Basayev, Habib Abd al-Rahman
 0.5: Shamil Basayev, Abdul Akhad
 0.5: Shafiq Rasul, Munir Ali
 0.5: Shafiq Rasul, Jamal Udeen

0.5: Sejahteratul Dursina, Suri Hanim Mohamad
 0.5: Sejahteratul Dursina, Ahmad Yani
 0.5: Sayed Agami Mohalal M, Tharwat Shihatah
 0.5: Samir Kishk, Abdelhalim Remadna
 0.5: Sami Essid Ben Khemais, Tarek Maaroufi
 0.5: Sameer Mohammed Ahmed al-Hada, Ahmad Mohammad Ali al-Hada
 0.5: Saeed Alghamdi, Mohand Alshehri
 0.5: Saeed Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.5: Sa'd Usama bin Laden, Hamza bin Ladin
 0.5: Sa'd Usama bin Laden, Ahmed bin Laden
 0.5: Ruhai Ahmed, Munir Ali
 0.5: Ruhai Ahmed, Jamal Udeen
 0.5: Ramzi Ibn-al-Shaiba, Sa'id Amin
 0.5: Ramzi Ibn-al-Shaiba, Abdallah al-Shafi
 0.5: Raed Hijazi, Mohammed al Massari
 0.5: Osama Rushdi, Sayyid Qutb
 0.5: Mustafa Abdulkader Aabed al-Ansari, Ahmad Mohammad Ali al-Hada
 0.5: Muhammad Abu Dhess, Tha'ir Mansour
 0.5: Muhammad Abu Dhess, Isma'il Shalabi
 0.5: Mohammed Jamal Khalifa, Ahmad Al-Gamen
 0.5: Mohammed bin Laden, Sa'd Usama bin Laden
 0.5: Maulana Masood Azhar, Hassan Hattab
 0.5: Maulana Masood Azhar, Hafiz Mohammed Saeed
 0.5: Maulana Masood Azhar, Farooq Kashmiri
 0.5: Maulana Masood Azhar, Abu Hamzu al-Masri
 0.5: Maulana Masood Azhar, Abu Basir al-Yamani
 0.5: Maulana Masood Azhar, Abd al-Rahim al-Nashiri
 0.5: Lased Ben Henin, Moktar Farid-Bouchoucha
 0.5: Lased Ben Henin, Mehdi Khammoun
 0.5: Lased Ben Henin, Essoussi Laaroussi
 0.5: Kamal Hadid Cha'r, Mohamed Setmarian Nasar
 0.5: Kamal Hadid Cha'r, Abdalrahman Alarnaot Abu-Aljer
 0.5: Junior Jikiron, Yunus Moklis
 0.5: Junior Jikiron, Tyron Santos
 0.5: Junior Jikiron, Redendo Delloso
 0.5: Junior Jikiron, Pio de Vera
 0.5: Junior Jikiron, Marvelo Egil
 0.5: Junior Jikiron, Angelo Trinidad
 0.5: Junior Jikiron, Alan Borloagdatan
 0.5: Junior Jikiron, Ahma Aluan
 0.5: Jerome Courtailler, Amine Mezbar
 0.5: Jaffar Umar Thalib, Eri Ziyad Abu Zaki
 0.5: Imad Eddin Barakat, Mamoun Darkazanli
 0.5: Hiram Torres, Mohamed Bayazid
 0.5: Hamza Alghamdi, Mohand Alshehri
 0.5: Hamza Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.5: Feroz Abassi, Jamal Udeen
 0.5: Fawaz Yahya Al-Rabeei, Ahmad Mohammad Ali al-Hada
 0.5: Faiz Abu Bakar Bafana, Mohamad Khalim bin Jaffar
 0.5: Charles Taylor, Ibrahim Bah
 0.5: Charles Taylor, Ahmed Ghailani
 0.5: Charles Taylor, Abdullah Mohammed

0.5: Asif Iqbal, Munir Ali
 0.5: Asif Iqbal, Jamal Udeen
 0.5: Alexander Yurievich Rummyantsev, Vladimir Putin
 0.5: Alexander Yurievich Rummyantsev, George Walker Bush
 0.5: Ahmed Omar Abdel Rahman, Mohammed Abdel-Rahman
 0.5: Ahmed Alnami, Majed Moqed
 0.5: Ahmad Said Khadr, Tharwat Shihatah
 0.5: Abu Malik, Mohamed Bayazid
 0.5: Abu Khalid, Gushuf
 0.5: Abu Khalid, Abu Zaynab
 0.5: Abu Khalid, Abu Shala
 0.5: Abu Khalid, Abu Muaz el-Masry
 0.5: Abu Khalid, Abu Khalid el-Masry
 0.5: Abu Jaafar, Abdelhalim Remadna
 0.5: Abdul Hakim Murad, Wali Khan Amin Shah
 0.5: Abdel Ghani Rabia, Amine Mezbar
 0.4444: Wadih Hage, Mohamed Rashed Daoud Owhali
 0.4286: Waleed M. Alshehri, Amer Kamfar
 0.4286: John Walker Lindh, Yasser Esam Hamdi
 0.4286: Imad Eddin Barakat, Muhammad Galeb Kalaje Zouaydi
 0.4: Wail M. Alshehri, Ahmed Alnami
 0.4: Muhammad Galeb Kalaje Zouaydi, Mamoun Darkazanli
 0.4: Mohammed Saddiq Odeh, Wadih Hage
 0.4: Khalfan Khamis Mohamed, Wadih Hage
 0.4: Christian Manfred G., Mouhamedou Ould Slehi
 0.4: Abdurajak Janjalani, Hector Janjalani
 0.4: Abdurajak Janjalani, Abu Sabaya
 0.3889: Mohammad Omar, Mullah Mohammad Omar
 0.375: Ziad Samir Jarrar, Salem Alhazmi
 0.375: Ramzi Binalshibh, Said Bahaji
 0.3636: Mohammed Atta, Marwan Al-Shehhi
 0.3333: Youssef Nada, Yasin al-Qadi
 0.3333: Youssef Nada, Ahmed Idris Nasreddin
 0.3333: Youssef Nada, Abdelkader Mahmoud Es Sayed
 0.3333: Yasser Esam Hamdi, Mohamed Bayazid
 0.3333: Waleed M. Alshehri, Ahmed Alnami
 0.3333: Wadih El-Hage, Mohamed Bayazid
 0.3333: Tariq Anwar, Sayed Agami Mohalal M
 0.3333: Tariq Anwar, Ahmad Said Khadr
 0.3333: Tarek Maaroufi, Tarek Chaarabi
 0.3333: Tarek Maaroufi, Moktar Farid-Bouchoucha
 0.3333: Tarek Maaroufi, Mohamed Sliti
 0.3333: Tarek Maaroufi, Mohamed Aouadi
 0.3333: Tarek Maaroufi, Mehdi Khammoun
 0.3333: Tarek Maaroufi, Essoussi Laaroussi
 0.3333: Tarek Maaroufi, Bouraoui El-Ouaer
 0.3333: Tarek Maaroufi, Abdelsattar Dahmane
 0.3333: Sheikh Mir Hamza, Mohammed Jamal Khalifa
 0.3333: Samir Kishk, Lased Ben Henin
 0.3333: Sami Essid Ben Khemais, Tarek Chaarabi
 0.3333: Sami Essid Ben Khemais, Moktar Farid-Bouchoucha
 0.3333: Sami Essid Ben Khemais, Mohamed Aouadi

0.3333: Sami Essid Ben Khemais, Mehdi Khammoun
 0.3333: Sami Essid Ben Khemais, Essoussi Laaroussi
 0.3333: Salem Alhazmi, Marwan al-Barghuthi
 0.3333: Salah Hajir, Sa'id Amin
 0.3333: Salah Hajir, Abdallah al-Shafi
 0.3333: Saeed Alghamdi, Hamza Alghamdi
 0.3333: Rifa'i Taha Musa, Tharwat Shihatah
 0.3333: Rifa'i Taha Musa, Sayyid Qutb
 0.3333: Omar Ibn al Khattab, Tohir Yuldashev
 0.3333: Omar Ibn al Khattab, Hassan Hattab
 0.3333: Omar Ibn al Khattab, Hafiz Mohammed Saeed
 0.3333: Omar Ibn al Khattab, Farooq Kashmiri
 0.3333: Omar Ibn al Khattab, Abu Hamzu al-Masri
 0.3333: Omar Ibn al Khattab, Abu Basir al-Yamani
 0.3333: Omar Ibn al Khattab, Abdul Akhad
 0.3333: Omar Ibn al Khattab, Abd al-Rahim al-Nashiri
 0.3333: Nizar Trabelsi, Amine Mezbar
 0.3333: Nizar Ben Mohammed Nawar, Munir al-Mutasaddiq
 0.3333: Nizar Ben Mohammed Nawar, Khalid al-Shanqiti
 0.3333: Mustapha Labsi, Abdel Abdel Bary
 0.3333: Muhammad Salah, Tariq Anwar
 0.3333: Mokhtar Haouari, Fateh Kamel
 0.3333: Mohamad Khalim bin Jaffar, Mohd Agus Ahmad Selani.
 0.3333: Mohamad Khalim bin Jaffar, Faizal Khan Gulam Sarwar
 0.3333: Mamoun Darkazanli, Nabil Sayadi
 0.3333: Mamoun Darkazanli, Nabil Nanakli Kosaibati
 0.3333: Mamoun Darkazanli, Mohamad Bahaih
 0.3333: Mamoun Darkazanli, Gushuf
 0.3333: Mamoun Darkazanli, Abu Zaynab
 0.3333: Mamoun Darkazanli, Abu Shala
 0.3333: Mamoun Darkazanli, Abdul Fatath Zammar
 0.3333: Majed Moqed, Satam M.A. Al Suqami
 0.3333: Majed Moqed, Mohand Alshehri
 0.3333: Majed Moqed, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad
 0.3333: L'Houssaine Kherchtou, Mohamed Rashed Daoud Owhali
 0.3333: Khalid Shaikh Mohammed, Ahmed bin Laden
 0.3333: Khadafy Janjalani, Yunus Moklis
 0.3333: Khadafy Janjalani, Tyron Santos
 0.3333: Khadafy Janjalani, Redendo Dellosa
 0.3333: Khadafy Janjalani, Pio de Vera
 0.3333: Khadafy Janjalani, Marvelo Egil
 0.3333: Khadafy Janjalani, Hassan Hattab
 0.3333: Khadafy Janjalani, Hafiz Mohammed Saeed
 0.3333: Khadafy Janjalani, Farooq Kashmiri
 0.3333: Khadafy Janjalani, Angelo Trinidad
 0.3333: Khadafy Janjalani, Alan Borloagdatan
 0.3333: Khadafy Janjalani, Abu Hamzu al-Masri
 0.3333: Khadafy Janjalani, Abu Basir al-Yamani
 0.3333: Khadafy Janjalani, Abd al-Rahim al-Nashiri
 0.3333: Jamal Udeen, Munir Ali
 0.3333: Imad Mugnyyah, Mohamad Hammoud
 0.3333: Imad Mugnyyah, Abbas Harake

0.3333: Hiram Torres, Raed Hijazi
 0.3333: Ghashub al-Abrash al-Ghalyun, Mohamed Setmariam Nasar
 0.3333: Ghashub al-Abrash al-Ghalyun, Abdalrahman Alarnaot Abu-Aljer
 0.3333: Feroz Abassi, Shafiq Rasul
 0.3333: Feroz Abassi, Ruhai Ahmed
 0.3333: Feroz Abassi, Asif Iqbal
 0.3333: Fazlul Rehman Khalil, Mohammed Jamal Khalifa
 0.3333: Fathur Rohman al-Ghozi, Faiz Abu Bakar Bafana
 0.3333: Fateh Kamel, Abdel Abdel Bary
 0.3333: Ali Salem Kahlal al-Marr, Ramzi Ibn-al-Shaiba
 0.3333: Ali Mohammad, Mohamed Rashed Daoud Owahli
 0.3333: Ali Mohammad, L'Houssaine Kherchtou
 0.3333: Ahmed Ibrahim A. Al Haznawi, Wail M. Alshehri
 0.3333: Ahmed Alnami, Satam M.A. Al Suqami
 0.3333: Ahmed Alnami, Mohand Alshehri
 0.3333: Ahmed Alnami, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
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 0.3333: Ahmed Alghamdi, Mohammed al Massari
 0.3333: Ahmed Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.3333: Ahmad Said Khadr, Sayed Agami Mohalal M
 0.3333: Ahmad Fadik al Khalalilah, Tha'ir Mansour
 0.3333: Ahmad Fadik al Khalalilah, Isma'il Shalabi
 0.3333: Adnan Bukhari, Waleed M. Alshehri
 0.3333: Abu Malik, Raed Hijazi
 0.3333: Abu Jaafar, Yacine Aknouche
 0.3333: Abu Jaafar, Samir Kishk
 0.3333: Abdel Raouf Hawas, Shamim Sarwar
 0.3: Ramzi Binalshibh, Christian Manfred G.
 0.3: Khalfan Khamis Mohamed, L'Houssaine Kherchtou
 0.3: Khalfan Khamis Mohamed, Ali Mohammad

A6. Pairs of people names with transitive closure of PDP2 ≥ 3

Percentage of Total: 1.8273 %

Number of Pairs: 921

1: Vladimir Putin, George Walker Bush
 1: Tyron Santos, Yunus Moklis
 1: Tohir Yuldashev, Abdul Akhad
 1: Ruhai Ahmed, Shafiq Rasul
 1: Redendo Dellosa, Yunus Moklis
 1: Redendo Dellosa, Tyron Santos
 1: Pio de Vera, Yunus Moklis
 1: Pio de Vera, Tyron Santos
 1: Pio de Vera, Redendo Dellosa
 1: Nabil Nanakli Kosaibati, Nabil Sayadi
 1: Mustafa Abdulkader Aabed al-Ansari, Sameer Mohammed Ahmed al-Hada
 1: Muhammed Ali Mukhtar, Suleiman Asad
 1: Muhammad Shawqi al-Islambuli, Tal'at Fu'ad Qasim
 1: Muhammad Hussein Fadhlallah, Muhammad Ubaid
 1: Movladi Udugov, Wahhabi Achimez Gochiyayev
 1: Mohamed Aouadi, Tarek Chaarabi
 1: Mohamad Bahaih, Nabil Sayadi

1: Mohamad Bahaih, Nabil Nanakli Kosaibati
 1: Mehdi Khammoun, Moktar Farid-Bouchoucha
 1: Marvelo Egil, Yunus Moklis
 1: Marvelo Egil, Tyron Santos
 1: Marvelo Egil, Redendo Dellosa
 1: Marvelo Egil, Pio de Vera
 1: Latif Mansour, Saif Rahman
 1: Khizir Alkhazurov, Uvais Akhmadov
 1: Khalid Ibn Muhammad Al-Juhani, Muhammad Sa'id Ali Hasan
 1: Khalid al-Shanqiti, Munir al-Mutasaddiq
 1: Junior Jikiron, Ustadz Nur Mohammed Umog
 1: Isma'il Shalabi, Tha'ir Mansour
 1: Ibrahim Mamdouh Elleban, Mohamed Aouzar
 1: Hamed Abderrahman Ahmed, Reswan Abdul Ulsalam
 1: Hafiz Mohammed Saeed, Hassan Hattab
 1: Habib Abd al-Rahman, Uvais Akhmadov
 1: Habib Abd al-Rahman, Khizir Alkhazurov
 1: Fouhad Sabour, Salim Boukhari
 1: Fazlul Rehman Khalil, Sheikh Mir Hamza
 1: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Mohand Alshehri
 1: Fawaz Yahya Al-Rabeei, Sameer Mohammed Ahmed al-Hada
 1: Fawaz Yahya Al-Rabeei, Mustafa Abdulkader Aabed al-Ansari
 1: Farooq Kashmiri, Hassan Hattab
 1: Farooq Kashmiri, Hafiz Mohammed Saeed
 1: Faker Boussora, Muhammad Sa'id Ali Hasan
 1: Faker Boussora, Khalid Ibn Muhammad Al-Juhani
 1: Faizal Khan Gulam Sarwar, Mohd Agus Ahmad Selani.
 1: Essoussi Laaroussi, Moktar Farid-Bouchoucha
 1: Essoussi Laaroussi, Mehdi Khammoun
 1: Bouraoui El-Ouaer, Mohamed Sliti
 1: Asif Iqbal, Shafiq Rasul
 1: Asif Iqbal, Ruhul Ahmed
 1: Angelo Trinidad, Yunus Moklis
 1: Angelo Trinidad, Tyron Santos
 1: Angelo Trinidad, Redendo Dellosa
 1: Angelo Trinidad, Pio de Vera
 1: Angelo Trinidad, Marvelo Egil
 1: Amar Chidek, Jean-Marc Granvisir
 1: Al-Sa'id Ali Hasan Mukhlis, Gueddan Abdel Fatah
 1: Ali Qaed Senyan al-Harhi, Mohammed Hamdi al-Ahdal
 1: Ali al-Rashidi, Tal'at Fu'ad Qasim
 1: Ali al-Rashidi, Muhammad Shawqi al-Islambuli
 1: Alan Borloagdatan, Yunus Moklis
 1: Alan Borloagdatan, Tyron Santos
 1: Alan Borloagdatan, Redendo Dellosa
 1: Alan Borloagdatan, Pio de Vera
 1: Alan Borloagdatan, Marvelo Egil
 1: Alan Borloagdatan, Angelo Trinidad
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Muhammad Sa'id Ali Hasan
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Khalid Ibn Muhammad Al-Juhani
 1: Al Rauf Bin Al Habib Bin Yousef Al-Jiddi, Faker Boussora
 1: Ahmed Ghailani, Ibrahim Bah

1: Ahmad Yani, Suri Hanim Mohamad
 1: Ahmad Ibrahim Al-Mughassil, Sheikh Ahmed Salim Swedan
 1: Abu Zaynab, Gushuf
 1: Abu Shala, Gushuf
 1: Abu Shala, Abu Zaynab
 1: Abu Sabaya, Hector Janjalani
 1: Abu Malik, Hiram Torres
 1: Abu Khalid el-Masry, Abu Muaz el-Masry
 1: Abu Hamzu al-Masri, Hassan Hattab
 1: Abu Hamzu al-Masri, Hafiz Mohammed Saeed
 1: Abu Hamzu al-Masri, Farooq Kashmiri
 1: Abu Basir al-Yamani, Hassan Hattab
 1: Abu Basir al-Yamani, Hafiz Mohammed Saeed
 1: Abu Basir al-Yamani, Farooq Kashmiri
 1: Abu Basir al-Yamani, Abu Hamzu al-Masri
 1: Abu Abdulrahman, Reswan Abdul Ulsalam
 1: Abu Abdulrahman, Hamed Abderrahman Ahmed
 1: Abdullah Mohammed, Ibrahim Bah
 1: Abdullah Mohammed, Ahmed Ghailani
 1: Abdul Rehman Zahid, Noor Mohammad Saqib
 1: Abdul Haq, Maulvi Mehmood Din
 1: Abdul Fatath Zammar, Nabil Sayadi
 1: Abdul Fatath Zammar, Nabil Nanakli Kosaibati
 1: Abdul Fatath Zammar, Mohamad Bahaih
 1: Abdelsattar Dahmane, Mohamed Sliti
 1: Abdelsattar Dahmane, Bouraoui El-Ouaer
 1: Abdellah M'Sefer Ali Al Ghamdi, Hilal Jaber Aouad Alassiri
 1: Abdelkader Mahmoud Es Sayed, Ahmed Idris Nasreddin
 1: Abdel Ghani Rabia, Jerome Courtailler
 1: Abdalrahman Alarnaot Abu-Aljer, Mohamed Setmarian Nasar
 1: Abdallah al-Shafi, Sa'id Amin
 1: Abd al-Rahim al-Nashiri, Hassan Hattab
 1: Abd al-Rahim al-Nashiri, Hafiz Mohammed Saeed
 1: Abd al-Rahim al-Nashiri, Farooq Kashmiri
 1: Abd al-Rahim al-Nashiri, Abu Hamzu al-Masri
 1: Abd al-Rahim al-Nashiri, Abu Basir al-Yamani
 1: Abbas Harake, Mohamad Hammoud
 0.8571: Khalfan Khamis Mohamed, Mohamed Rashed Daoud Owhali
 0.8: Zuher Hilal Mohamed Al Tbabti, Hilal Jaber Aouad Alassiri
 0.8: Zuher Hilal Mohamed Al Tbabti, Abdellah M'Sefer Ali Al Ghamdi
 0.8: Muhammad Galeb Kalaje, Muhammad Galeb Kalaje Zouaydi
 0.75: Abdullah Yusuf, Abdullah Yusuf Azzam
 0.75: Abdul Majid, Bashir-ud-Din Mahmood
 0.7143: Adnan Bukhari, Amer Kamfar
 0.7: Khalid Almihdhar, Nawaf Alhazmi
 0.6667: Youssef Nada, Shaykh Ahme Nur Jimale
 0.6667: Wadih El-Hage, Hiram Torres
 0.6667: Wadih El-Hage, Abu Malik
 0.6667: Omar Abd al-Rahman, Sheikh Omar Abd al-Rahman
 0.6667: Nizar Trabelsi, Jerome Courtailler
 0.6667: Nizar Trabelsi, Abdel Ghani Rabia
 0.6667: Nizar Ben Mohammed Nawar, Mouhamedou Ould Slehi

0.6667: Ahmed Alnami, Saeed Alghamdi
 0.6667: Ahmed Alghamdi, Hamza Alghamdi
 0.6667: Ahmad Fadik al Khalalilah, Muhammad Abu Dhess
 0.625: Mohammed Saddiq Odeh, Mohamed Rashed Daoud Owhali
 0.625: Mohammed Saddiq Odeh, Khalfan Khamis Mohamed
 0.6: Victor Bout, Sanjivan Ruprah
 0.6: Muhammad Galeb Kalaje, Mamoun Darkazanli
 0.6: Muhammad Galeb Kalaje Zouaydi, Mamoun Darkazanli
 0.6: Christian Manfred G., Nizar Ben Mohammed Nawar
 0.6: Christian Manfred G., Mouhamedou Ould Slehi
 0.5714: Imad Eddin Barakat, Muhammad Galeb Kalaje Zouaydi
 0.5714: Imad Eddin Barakat, Muhammad Galeb Kalaje
 0.5714: Imad Eddin Barakat, Mamoun Darkazanli
 0.5714: Djamal Beghal, Kamel Daoudi
 0.5: Yunus Moklis, Ahma Aluan
 0.5: Youssef Nada, Yasin al-Qadi
 0.5: Waleed M. Alshehri, Wail M. Alshehri
 0.5: Wadih El-Hage, Mohamed Bayazid
 0.5: Ustadz Nur Mohammed Umog, Yunus Moklis
 0.5: Ustadz Nur Mohammed Umog, Tyron Santos
 0.5: Ustadz Nur Mohammed Umog, Redendo Delloso
 0.5: Ustadz Nur Mohammed Umog, Pio de Vera
 0.5: Ustadz Nur Mohammed Umog, Marvelo Egil
 0.5: Ustadz Nur Mohammed Umog, Angelo Trinidad
 0.5: Ustadz Nur Mohammed Umog, Alan Borloagdatan
 0.5: Ustadz Nur Mohammed Umog, Ahma Aluan
 0.5: Tyron Santos, Ahma Aluan
 0.5: Tohir Yuldashev, Uvais Akhmadov
 0.5: Tohir Yuldashev, Khizir Alkhazurov
 0.5: Tohir Yuldashev, Habib Abd al-Rahman
 0.5: Tariq Anwar, Tharwat Shihatah
 0.5: Tariq Anwar, Sayed Agami Mohalal M
 0.5: Tariq Anwar, Ahmad Said Khadr
 0.5: Shaykh Ahme Nur Jimale, Yasin al-Qadi
 0.5: Shamil Basayev, Uvais Akhmadov
 0.5: Shamil Basayev, Tohir Yuldashev
 0.5: Shamil Basayev, Khizir Alkhazurov
 0.5: Shamil Basayev, Habib Abd al-Rahman
 0.5: Shamil Basayev, Abdul Akhad
 0.5: Shafiq Rasul, Munir Ali
 0.5: Shafiq Rasul, Jamal Udeen
 0.5: Sejahtatul Dursina, Suri Hanim Mohamad
 0.5: Sejahtatul Dursina, Ahmad Yani
 0.5: Sayed Agami Mohalal M, Tharwat Shihatah
 0.5: Samir Kishk, Abdelhalim Remadna
 0.5: Sami Essid Ben Khemais, Tarek Maaroufi
 0.5: Sameer Mohammed Ahmed al-Hada, Ahmad Mohammad Ali al-Hada
 0.5: Saeed Alghamdi, Mohand Alshehri
 0.5: Saeed Alghamdi, Hamza Alghamdi
 0.5: Saeed Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.5: Sa'd Usama bin Laden, Hamza bin Ladin
 0.5: Sa'd Usama bin Laden, Ahmed bin Laden

0.5: Ruhai Ahmed, Munir Ali
 0.5: Ruhai Ahmed, Jamal Udeen
 0.5: Redendo Dellosa, Ahma Aluan
 0.5: Ramzi Ibn-al-Shaiba, Sa'id Amin
 0.5: Ramzi Ibn-al-Shaiba, Abdallah al-Shafi
 0.5: Raed Hijazi, Mohammed al Massari
 0.5: Pio de Vera, Ahma Aluan
 0.5: Osama Rushdi, Sayyid Qutb
 0.5: Nizar Trabelsi, Amine Mezbar
 0.5: Mustafa Abdulkader Aabed al-Ansari, Ahmad Mohammad Ali al-Hada
 0.5: Muhammad Abu Dhess, Tha'ir Mansour
 0.5: Muhammad Abu Dhess, Isma'il Shalabi
 0.5: Mohammed Jamal Khalifa, Ahmad Al-Gamen
 0.5: Mohammed bin Laden, Sa'd Usama bin Laden
 0.5: Mohammed bin Laden, Hamza bin Ladin
 0.5: Mohammed bin Laden, Ahmed bin Laden
 0.5: Maulana Masood Azhar, Hassan Hattab
 0.5: Maulana Masood Azhar, Hafiz Mohammed Saeed
 0.5: Maulana Masood Azhar, Farooq Kashmiri
 0.5: Maulana Masood Azhar, Abu Hamzu al-Masri
 0.5: Maulana Masood Azhar, Abu Basir al-Yamani
 0.5: Maulana Masood Azhar, Abd al-Rahim al-Nashiri
 0.5: Marvelo Egil, Ahma Aluan
 0.5: Majed Moqed, Saeed Alghamdi
 0.5: Majed Moqed, Mohand Alshehri
 0.5: Majed Moqed, Hamza Alghamdi
 0.5: Majed Moqed, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.5: Majed Moqed, Ahmed Alghamdi
 0.5: Lased Ben Henin, Moktar Farid-Bouchoucha
 0.5: Lased Ben Henin, Mehdi Khammoun
 0.5: Lased Ben Henin, Essoussi Laaroussi
 0.5: Kamal Hadid Cha'r, Mohamed Setmariyan Nasar
 0.5: Kamal Hadid Cha'r, Abdalrahman Alarnaot Abu-Aljer
 0.5: Junior Jikiron, Yunus Moklis
 0.5: Junior Jikiron, Tyron Santos
 0.5: Junior Jikiron, Redendo Dellosa
 0.5: Junior Jikiron, Pio de Vera
 0.5: Junior Jikiron, Marvelo Egil
 0.5: Junior Jikiron, Angelo Trinidad
 0.5: Junior Jikiron, Alan Borloagdatan
 0.5: Junior Jikiron, Ahma Aluan
 0.5: Jerome Courtailler, Amine Mezbar
 0.5: Jamal Udeen, Munir Ali
 0.5: Jaffar Umar Thalib, Eri Ziyad Abu Zaki
 0.5: Hiram Torres, Mohamed Bayazid
 0.5: Hamza Alghamdi, Mohand Alshehri
 0.5: Hamza Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.5: Gushuf, Abu Muaz el-Masry
 0.5: Gushuf, Abu Khalid el-Masry
 0.5: Feroz Abassi, Shafiq Rasul
 0.5: Feroz Abassi, Ruhai Ahmed
 0.5: Feroz Abassi, Munir Ali

0.5: Feroz Abassi, Jamal Udeen
 0.5: Feroz Abassi, Asif Iqbal
 0.5: Fawaz Yahya Al-Rabeei, Ahmad Mohammad Ali al-Hada
 0.5: Faiz Abu Bakar Bafana, Mohamad Khalim bin Jaffar
 0.5: Charles Taylor, Ibrahim Bah
 0.5: Charles Taylor, Ahmed Ghailani
 0.5: Charles Taylor, Abdullah Mohammed
 0.5: Asif Iqbal, Munir Ali
 0.5: Asif Iqbal, Jamal Udeen
 0.5: Angelo Trinidad, Ahma Aluan
 0.5: Alexander Yurievich Rummyantsev, Vladimir Putin
 0.5: Alexander Yurievich Rummyantsev, George Walker Bush
 0.5: Alan Borloagdatan, Ahma Aluan
 0.5: Ahmed Omar Abdel Rahman, Mohammed Abdel-Rahman
 0.5: Ahmed bin Laden, Hamza bin Ladin
 0.5: Ahmed Alnami, Mohand Alshehri
 0.5: Ahmed Alnami, Majed Moqed
 0.5: Ahmed Alnami, Hamza Alghamdi
 0.5: Ahmed Alnami, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.5: Ahmed Alnami, Ahmed Alghamdi
 0.5: Ahmed Alghamdi, Saeed Alghamdi
 0.5: Ahmed Alghamdi, Mohand Alshehri
 0.5: Ahmed Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.5: Ahmad Said Khadr, Tharwat Shihatah
 0.5: Ahmad Said Khadr, Sayed Agami Mohalal M
 0.5: Ahmad Fadik al Khalalilah, Tha'ir Mansour
 0.5: Ahmad Fadik al Khalalilah, Isma'il Shalabi
 0.5: Abu Zaynab, Abu Muaz el-Masry
 0.5: Abu Zaynab, Abu Khalid el-Masry
 0.5: Abu Shala, Abu Muaz el-Masry
 0.5: Abu Shala, Abu Khalid el-Masry
 0.5: Abu Malik, Mohamed Bayazid
 0.5: Abu Khalid, Gushuf
 0.5: Abu Khalid, Abu Zaynab
 0.5: Abu Khalid, Abu Shala
 0.5: Abu Khalid, Abu Muaz el-Masry
 0.5: Abu Khalid, Abu Khalid el-Masry
 0.5: Abu Jaafar, Samir Kishk
 0.5: Abu Jaafar, Abdelhalim Remadna
 0.5: Abdul Hakim Murad, Wali Khan Amin Shah
 0.5: Abdul Akhad, Uvais Akhmadov
 0.5: Abdul Akhad, Khizir Alkhazurov
 0.5: Abdul Akhad, Habib Abd al-Rahman
 0.5: Abdel Ghani Rabia, Amine Mezbar
 0.4444: Wadih Hage, Mohamed Rashed Daoud Owhali
 0.4444: Mohammed Saddiq Odeh, Wadih Hage
 0.4444: Khalfan Khamis Mohamed, Wadih Hage
 0.4286: Waleed M. Alshehri, Amer Kamfar
 0.4286: John Walker Lindh, Yasser Esam Hamdi
 0.4286: Amer Kamfar, Wail M. Alshehri
 0.4286: Adnan Bukhari, Waleed M. Alshehri
 0.4286: Adnan Bukhari, Wail M. Alshehri

0.4: Waleed M. Alshehri, Saeed Alghamdi
 0.4: Waleed M. Alshehri, Mohand Alshehri
 0.4: Waleed M. Alshehri, Majed Moqed
 0.4: Waleed M. Alshehri, Hamza Alghamdi
 0.4: Waleed M. Alshehri, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad
 0.4: Waleed M. Alshehri, Ahmed Alnami
 0.4: Waleed M. Alshehri, Ahmed Alghamdi
 0.4: Wail M. Alshehri, Saeed Alghamdi
 0.4: Wail M. Alshehri, Mohand Alshehri
 0.4: Wail M. Alshehri, Majed Moqed
 0.4: Wail M. Alshehri, Hamza Alghamdi
 0.4: Wail M. Alshehri, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad
 0.4: Wail M. Alshehri, Ahmed Alnami
 0.4: Wail M. Alshehri, Ahmed Alghamdi
 0.4: Amer Kamfar, Saeed Alghamdi
 0.4: Amer Kamfar, Mohand Alshehri
 0.4: Amer Kamfar, Majed Moqed
 0.4: Amer Kamfar, Hamza Alghamdi
 0.4: Amer Kamfar, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad
 0.4: Amer Kamfar, Ahmed Alnami
 0.4: Amer Kamfar, Ahmed Alghamdi
 0.4: Adnan Bukhari, Saeed Alghamdi
 0.4: Adnan Bukhari, Mohand Alshehri
 0.4: Adnan Bukhari, Majed Moqed
 0.4: Adnan Bukhari, Hamza Alghamdi
 0.4: Adnan Bukhari, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad
 0.4: Adnan Bukhari, Ahmed Alnami
 0.4: Adnan Bukhari, Ahmed Alghamdi
 0.4: Abdurajak Janjalani, Hector Janjalani
 0.4: Abdurajak Janjalani, Abu Sabaya
 0.3889: Mohammad Omar, Mullah Mohammad Omar
 0.375: Ziad Samir Jarrah, Salem Alhazmi
 0.375: Ramzi Binalshibh, Said Bahaji
 0.3636: Mohammed Atta, Marwan Al-Shehhi
 0.3333: Ziad Samir Jarrah, Marwan al-Barghuthi
 0.3333: Yunus Moklis, Uvais Akhmadov
 0.3333: Yunus Moklis, Tohir Yuldashev
 0.3333: Yunus Moklis, Khizir Alkhazurov
 0.3333: Yunus Moklis, Hassan Hattab
 0.3333: Yunus Moklis, Hafiz Mohammed Saeed
 0.3333: Yunus Moklis, Habib Abd al-Rahman
 0.3333: Yunus Moklis, Farooq Kashmiri
 0.3333: Yunus Moklis, Abu Hamzu al-Masri
 0.3333: Yunus Moklis, Abu Basir al-Yamani
 0.3333: Yunus Moklis, Abdul Akhad
 0.3333: Yunus Moklis, Abd al-Rahim al-Nashiri
 0.3333: Youssef Nada, Ahmed Idris Nasreddin
 0.3333: Youssef Nada, Abdelkader Mahmoud Es Sayed
 0.3333: Yasser Esam Hamdi, Wadih El-Hage
 0.3333: Yasser Esam Hamdi, Satam M.A. Al Suqami
 0.3333: Yasser Esam Hamdi, Saeed Alghamdi
 0.3333: Yasser Esam Hamdi, Raed Hijazi

0.3333: Yasser Esam Hamdi, Mohand Alshehri
 0.3333: Yasser Esam Hamdi, Mohammed al Massari
 0.3333: Yasser Esam Hamdi, Mohamed Bayazid
 0.3333: Yasser Esam Hamdi, Majed Moqed
 0.3333: Yasser Esam Hamdi, Hiram Torres
 0.3333: Yasser Esam Hamdi, Hamza Alghamdi
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 0.3333: Farooq Kashmiri, Uvais Akhmadov
 0.3333: Farooq Kashmiri, Tohir Yuldashev
 0.3333: Farooq Kashmiri, Khizir Alkhazurov
 0.3333: Farooq Kashmiri, Habib Abd al-Rahman
 0.3333: Farooq Kashmiri, Ahma Aluan
 0.3333: Farooq Kashmiri, Abdul Akhad
 0.3333: Faiz Abu Bakar Bafana, Mohd Agus Ahmad Selani.
 0.3333: Faiz Abu Bakar Bafana, Faizal Khan Gulam Sarwar
 0.3333: Essoussi Laaroussi, Tarek Chaarabi
 0.3333: Essoussi Laaroussi, Mohamed Sliti
 0.3333: Essoussi Laaroussi, Mohamed Aouadi
 0.3333: Essoussi Laaroussi, Bouraoui El-Ouaer
 0.3333: Essoussi Laaroussi, Abdelsattar Dahmane
 0.3333: Christian Manfred G., Munir al-Mutasaddiq
 0.3333: Christian Manfred G., Khalid al-Shanqiti
 0.3333: Angelo Trinidad, Uvais Akhmadov
 0.3333: Angelo Trinidad, Tohir Yuldashev
 0.3333: Angelo Trinidad, Khizir Alkhazurov
 0.3333: Angelo Trinidad, Hassan Hattab
 0.3333: Angelo Trinidad, Hafiz Mohammed Saeed
 0.3333: Angelo Trinidad, Habib Abd al-Rahman
 0.3333: Angelo Trinidad, Farooq Kashmiri
 0.3333: Angelo Trinidad, Abu Hamzu al-Masri
 0.3333: Angelo Trinidad, Abu Basir al-Yamani
 0.3333: Angelo Trinidad, Abdul Akhad
 0.3333: Angelo Trinidad, Abd al-Rahim al-Nashiri
 0.3333: Amer Kamfar, Yasser Esam Hamdi
 0.3333: Amer Kamfar, Wadih El-Hage
 0.3333: Amer Kamfar, Satam M.A. Al Suqami
 0.3333: Amer Kamfar, Raed Hijazi
 0.3333: Amer Kamfar, Mohammed al Massari
 0.3333: Amer Kamfar, Mohamed Bayazid
 0.3333: Amer Kamfar, Hiram Torres
 0.3333: Amer Kamfar, Ahmed Ibrahim A. Al Haznawi
 0.3333: Amer Kamfar, Abu Malik
 0.3333: Ali Salem Kahlal al-Marr, Sa'id Amin
 0.3333: Ali Salem Kahlal al-Marr, Ramzi Ibn-al-Shaiba
 0.3333: Ali Salem Kahlal al-Marr, Abdallah al-Shafi
 0.3333: Ali Mohammad, Mohamed Rashed Daoud Owhali
 0.3333: Ali Mohammad, L'Houssaine Kherchtou
 0.3333: Alan Borloagdatan, Uvais Akhmadov
 0.3333: Alan Borloagdatan, Tohir Yuldashev
 0.3333: Alan Borloagdatan, Khizir Alkhazurov
 0.3333: Alan Borloagdatan, Hassan Hattab

0.3333: Alan Borloagdatan, Hafiz Mohammed Saeed
 0.3333: Alan Borloagdatan, Habib Abd al-Rahman
 0.3333: Alan Borloagdatan, Farooq Kashmiri
 0.3333: Alan Borloagdatan, Abu Hamzu al-Masri
 0.3333: Alan Borloagdatan, Abu Basir al-Yamani
 0.3333: Alan Borloagdatan, Abdul Akhad
 0.3333: Alan Borloagdatan, Abd al-Rahim al-Nashiri
 0.3333: Ahmed Ibrahim A. Al Haznawi, Yasser Esam Hamdi
 0.3333: Ahmed Ibrahim A. Al Haznawi, Wail M. Alshehri
 0.3333: Ahmed Ibrahim A. Al Haznawi, Wadih El-Hage
 0.3333: Ahmed Ibrahim A. Al Haznawi, Satam M.A. Al Suqami
 0.3333: Ahmed Ibrahim A. Al Haznawi, Saeed Alghamdi
 0.3333: Ahmed Ibrahim A. Al Haznawi, Raed Hijazi
 0.3333: Ahmed Ibrahim A. Al Haznawi, Mohand Alshehri
 0.3333: Ahmed Ibrahim A. Al Haznawi, Mohammed al Massari
 0.3333: Ahmed Ibrahim A. Al Haznawi, Mohamed Bayazid
 0.3333: Ahmed Ibrahim A. Al Haznawi, Majed Moqed
 0.3333: Ahmed Ibrahim A. Al Haznawi, Hiram Torres
 0.3333: Ahmed Ibrahim A. Al Haznawi, Hamza Alghamdi
 0.3333: Ahmed Ibrahim A. Al Haznawi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.3333: Ahmed Ibrahim A. Al Haznawi, Ahmed Alnami
 0.3333: Ahmed Ibrahim A. Al Haznawi, Ahmed Alghamdi
 0.3333: Ahmed Ibrahim A. Al Haznawi, Abu Malik
 0.3333: Ahmed Alnami, Wadih El-Hage
 0.3333: Ahmed Alnami, Satam M.A. Al Suqami
 0.3333: Ahmed Alnami, Raed Hijazi
 0.3333: Ahmed Alnami, Mohammed al Massari
 0.3333: Ahmed Alnami, Mohamed Bayazid
 0.3333: Ahmed Alnami, Hiram Torres
 0.3333: Ahmed Alnami, Abu Malik
 0.3333: Ahmed Alghamdi, Satam M.A. Al Suqami
 0.3333: Ahmed Alghamdi, Raed Hijazi
 0.3333: Ahmed Alghamdi, Mohammed al Massari
 0.3333: Ahmed Alghamdi, Mohamed Bayazid
 0.3333: Ahmed Alghamdi, Hiram Torres
 0.3333: Ahmed Alghamdi, Abu Malik
 0.3333: Ahmad Said Khadr, Sayyid Qutb
 0.3333: Ahmad Said Khadr, Osama Rushdi
 0.3333: Ahma Aluan, Uvais Akhmadov
 0.3333: Ahma Aluan, Khizir Alkhazurov
 0.3333: Ahma Aluan, Habib Abd al-Rahman
 0.3333: Ahma Aluan, Abdul Akhad
 0.3333: Adnan Bukhari, Yasser Esam Hamdi
 0.3333: Adnan Bukhari, Wadih El-Hage
 0.3333: Adnan Bukhari, Satam M.A. Al Suqami
 0.3333: Adnan Bukhari, Raed Hijazi
 0.3333: Adnan Bukhari, Mohammed al Massari
 0.3333: Adnan Bukhari, Mohamed Bayazid
 0.3333: Adnan Bukhari, Hiram Torres
 0.3333: Adnan Bukhari, Ahmed Ibrahim A. Al Haznawi
 0.3333: Adnan Bukhari, Abu Malik
 0.3333: Abu Zaynab, Nabil Sayadi

0.3333: Abu Zaynab, Nabil Nanakli Kosaibati
0.3333: Abu Zaynab, Mohamad Bahaih
0.3333: Abu Zaynab, Abdul Fatath Zammar
0.3333: Abu Shala, Nabil Sayadi
0.3333: Abu Shala, Nabil Nanakli Kosaibati
0.3333: Abu Shala, Mohamad Bahaih
0.3333: Abu Shala, Abdul Fatath Zammar
0.3333: Abu Muaz el-Masry, Nabil Sayadi
0.3333: Abu Muaz el-Masry, Nabil Nanakli Kosaibati
0.3333: Abu Muaz el-Masry, Mohamad Bahaih
0.3333: Abu Muaz el-Masry, Abdul Fatath Zammar
0.3333: Abu Malik, Satam M.A. Al Suqami
0.3333: Abu Malik, Raed Hijazi
0.3333: Abu Malik, Mohand Alshehri
0.3333: Abu Malik, Mohammed al Massari
0.3333: Abu Malik, Hamza Alghamdi
0.3333: Abu Malik, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
0.3333: Abu Khalid, Nabil Sayadi
0.3333: Abu Khalid, Nabil Nanakli Kosaibati
0.3333: Abu Khalid, Mohamad Bahaih
0.3333: Abu Khalid, Abdul Fatath Zammar
0.3333: Abu Khalid el-Masry, Nabil Sayadi
0.3333: Abu Khalid el-Masry, Nabil Nanakli Kosaibati
0.3333: Abu Khalid el-Masry, Mohamad Bahaih
0.3333: Abu Khalid el-Masry, Abdul Fatath Zammar
0.3333: Abu Jaafar, Yacine Aknouche
0.3333: Abu Jaafar, Tarek Chaarabi
0.3333: Abu Jaafar, Moktar Farid-Bouchoucha
0.3333: Abu Jaafar, Mohamed Sliiti
0.3333: Abu Jaafar, Mohamed Aouadi
0.3333: Abu Jaafar, Mehdi Khammoun
0.3333: Abu Jaafar, Lased Ben Henin
0.3333: Abu Jaafar, Essoussi Laaroussi
0.3333: Abu Jaafar, Bouraoui El-Ouaer
0.3333: Abu Jaafar, Abdelsattar Dahmane
0.3333: Abu Hamzu al-Masri, Uvais Akhmadov
0.3333: Abu Hamzu al-Masri, Tohir Yuldashev
0.3333: Abu Hamzu al-Masri, Khizir Alkhazurov
0.3333: Abu Hamzu al-Masri, Habib Abd al-Rahman
0.3333: Abu Hamzu al-Masri, Ahma Aluan
0.3333: Abu Hamzu al-Masri, Abdul Akhad
0.3333: Abu Basir al-Yamani, Uvais Akhmadov
0.3333: Abu Basir al-Yamani, Tohir Yuldashev
0.3333: Abu Basir al-Yamani, Khizir Alkhazurov
0.3333: Abu Basir al-Yamani, Habib Abd al-Rahman
0.3333: Abu Basir al-Yamani, Ahma Aluan
0.3333: Abu Basir al-Yamani, Abdul Akhad
0.3333: Abdelhalim Remadna, Tarek Chaarabi
0.3333: Abdelhalim Remadna, Moktar Farid-Bouchoucha
0.3333: Abdelhalim Remadna, Mohamed Sliiti
0.3333: Abdelhalim Remadna, Mohamed Aouadi
0.3333: Abdelhalim Remadna, Mehdi Khammoun

0.3333: Abdelhalim Remadna, Essoussi Laaroussi
 0.3333: Abdelhalim Remadna, Bouraoui El-Ouaer
 0.3333: Abdelhalim Remadna, Abdelsattar Dahmane
 0.3333: Abdel Raouf Hawas, Shamim Sarwar
 0.3333: Abd al-Rahim al-Nashiri, Uvais Akhmadov
 0.3333: Abd al-Rahim al-Nashiri, Tohir Yuldashev
 0.3333: Abd al-Rahim al-Nashiri, Khizir Alkhazurov
 0.3333: Abd al-Rahim al-Nashiri, Habib Abd al-Rahman
 0.3333: Abd al-Rahim al-Nashiri, Ahma Aluan
 0.3333: Abd al-Rahim al-Nashiri, Abdul Akhad
 0.3: Said Bahaji, Munir al-Mutasaddiq
 0.3: Said Bahaji, Mouhamedou Ould Slehi
 0.3: Said Bahaji, Khalid al-Shanqiti
 0.3: Ramzi Binalshibh, Nizar Ben Mohammed Nawar
 0.3: Ramzi Binalshibh, Munir al-Mutasaddiq
 0.3: Ramzi Binalshibh, Mouhamedou Ould Slehi
 0.3: Ramzi Binalshibh, Khalid al-Shanqiti
 0.3: Ramzi Binalshibh, Christian Manfred G.
 0.3: Nizar Ben Mohammed Nawar, Said Bahaji
 0.3: Christian Manfred G., Said Bahaji

A7. Pairs of events with EGP ≥ 3

Percentage of Total: 48.7179 %

Number of Pairs: 38

1: US Embassy bombing--Paris, US Embassy Bombing...New Delhi
 1: U.S. Embassy Bombing--Kenya, U.S. Embassy Bombing--Tanzania
 1: Pennsylvania Flight, Pentagon Attack
 1: La Griba Synagogue Explosion, US Embassy bombing--Paris
 1: La Griba Synagogue Explosion, US Embassy Bombing...New Delhi
 1: La Griba Synagogue Explosion, Khobar Towers Bombing
 1: Khobar Towers Bombing, US Embassy bombing--Paris
 1: Khobar Towers Bombing, US Embassy Bombing...New Delhi
 0.71: U.S. Embassy Bombing--Tanzania, Pentagon Attack
 0.71: U.S. Embassy Bombing--Kenya, Pentagon Attack
 0.71: U.S. Embassy Bombing--Kenya, Pennsylvania Flight
 0.71: Pennsylvania Flight, U.S. Embassy Bombing--Tanzania
 0.67: World Trade Center 9/11 Attack, Pentagon Attack
 0.67: U.S. Embassy Bombing--Kenya, Luxor Massacre
 0.67: Pennsylvania Flight, World Trade Center 9/11 Attack
 0.67: Pennsylvania Flight, Luxor Massacre
 0.67: Luxor Massacre, U.S. Embassy Bombing--Tanzania
 0.67: Luxor Massacre, Pentagon Attack
 0.5: World Trade Center Bombing, US Embassy bombing--Paris
 0.5: World Trade Center Bombing, US Embassy Bombing...New Delhi
 0.5: World Trade Center Bombing, Luxor Massacre
 0.5: World Trade Center Bombing, La Griba Synagogue Explosion
 0.5: World Trade Center Bombing, Khobar Towers Bombing
 0.5: USS Cole Bombing, World Trade Center 9/11 Attack
 0.5: USS Cole Bombing, US Embassy bombing--Paris
 0.5: USS Cole Bombing, US Embassy Bombing...New Delhi
 0.5: USS Cole Bombing, Khobar Towers Bombing

0.5: La Griba Synagogue Explosion, USS Cole Bombing
 0.43: World Trade Center 9/11 Attack, U.S. Embassy Bombing--Tanzania
 0.43: U.S. Embassy Bombing--Kenya, World Trade Center 9/11 Attack
 0.33: World Trade Center Bombing, USS Cole Bombing
 0.33: World Trade Center Bombing, U.S. Embassy Bombing--Tanzania
 0.33: World Trade Center Bombing, Pentagon Attack
 0.33: World Trade Center Bombing, Pennsylvania Flight
 0.33: USS Cole Bombing, Pentagon Attack
 0.33: U.S. Embassy Bombing--Kenya, World Trade Center Bombing
 0.33: Pennsylvania Flight, USS Cole Bombing
 0.33: Luxor Massacre, World Trade Center 9/11 Attack

A8. Pairs of events with transitive closure of EGP ≥ 3

Percentage of Total: 84.6154 %

Number of Pairs: 66

1: US Embassy bombing--Paris, US Embassy Bombing...New Delhi
 1: U.S. Embassy Bombing--Kenya, U.S. Embassy Bombing--Tanzania
 1: Pennsylvania Flight, Pentagon Attack
 1: La Griba Synagogue Explosion, US Embassy bombing--Paris
 1: La Griba Synagogue Explosion, US Embassy Bombing...New Delhi
 1: La Griba Synagogue Explosion, Khobar Towers Bombing
 1: Khobar Towers Bombing, US Embassy bombing--Paris
 1: Khobar Towers Bombing, US Embassy Bombing...New Delhi
 0.71: U.S. Embassy Bombing--Tanzania, Pentagon Attack
 0.71: U.S. Embassy Bombing--Kenya, Pentagon Attack
 0.71: U.S. Embassy Bombing--Kenya, Pennsylvania Flight
 0.71: Pennsylvania Flight, U.S. Embassy Bombing--Tanzania
 0.67: World Trade Center 9/11 Attack, U.S. Embassy Bombing--Tanzania
 0.67: World Trade Center 9/11 Attack, Pentagon Attack
 0.67: U.S. Embassy Bombing--Kenya, World Trade Center 9/11 Attack
 0.67: U.S. Embassy Bombing--Kenya, Luxor Massacre
 0.67: Pennsylvania Flight, World Trade Center 9/11 Attack
 0.67: Pennsylvania Flight, Luxor Massacre
 0.67: Luxor Massacre, World Trade Center 9/11 Attack
 0.67: Luxor Massacre, U.S. Embassy Bombing--Tanzania
 0.67: Luxor Massacre, Pentagon Attack
 0.5: World Trade Center Bombing, World Trade Center 9/11 Attack
 0.5: World Trade Center Bombing, USS Cole Bombing
 0.5: World Trade Center Bombing, US Embassy bombing--Paris
 0.5: World Trade Center Bombing, US Embassy Bombing...New Delhi
 0.5: World Trade Center Bombing, U.S. Embassy Bombing--Tanzania
 0.5: World Trade Center Bombing, Pentagon Attack
 0.5: World Trade Center Bombing, Pennsylvania Flight
 0.5: World Trade Center Bombing, Luxor Massacre
 0.5: World Trade Center Bombing, La Griba Synagogue Explosion
 0.5: World Trade Center Bombing, Khobar Towers Bombing
 0.5: World Trade Center 9/11 Attack, US Embassy bombing--Paris
 0.5: World Trade Center 9/11 Attack, US Embassy Bombing...New Delhi
 0.5: USS Cole Bombing, World Trade Center 9/11 Attack
 0.5: USS Cole Bombing, US Embassy bombing--Paris
 0.5: USS Cole Bombing, US Embassy Bombing...New Delhi

0.5: USS Cole Bombing, U.S. Embassy Bombing--Tanzania
 0.5: USS Cole Bombing, Pentagon Attack
 0.5: USS Cole Bombing, Luxor Massacre
 0.5: USS Cole Bombing, Khobar Towers Bombing
 0.5: US Embassy bombing--Paris, Pentagon Attack
 0.5: US Embassy Bombing...New Delhi, Pentagon Attack
 0.5: U.S. Embassy Bombing--Tanzania, US Embassy bombing--Paris
 0.5: U.S. Embassy Bombing--Tanzania, US Embassy Bombing...New Delhi
 0.5: U.S. Embassy Bombing--Kenya, World Trade Center Bombing
 0.5: U.S. Embassy Bombing--Kenya, USS Cole Bombing
 0.5: U.S. Embassy Bombing--Kenya, US Embassy bombing--Paris
 0.5: U.S. Embassy Bombing--Kenya, US Embassy Bombing...New Delhi
 0.5: U.S. Embassy Bombing--Kenya, La Griba Synagogue Explosion
 0.5: U.S. Embassy Bombing--Kenya, Khobar Towers Bombing
 0.5: Pennsylvania Flight, USS Cole Bombing
 0.5: Pennsylvania Flight, US Embassy bombing--Paris
 0.5: Pennsylvania Flight, US Embassy Bombing...New Delhi
 0.5: Pennsylvania Flight, Khobar Towers Bombing
 0.5: Luxor Massacre, US Embassy bombing--Paris
 0.5: Luxor Massacre, US Embassy Bombing...New Delhi
 0.5: La Griba Synagogue Explosion, World Trade Center 9/11 Attack
 0.5: La Griba Synagogue Explosion, USS Cole Bombing
 0.5: La Griba Synagogue Explosion, U.S. Embassy Bombing--Tanzania
 0.5: La Griba Synagogue Explosion, Pentagon Attack
 0.5: La Griba Synagogue Explosion, Pennsylvania Flight
 0.5: La Griba Synagogue Explosion, Luxor Massacre
 0.5: Khobar Towers Bombing, World Trade Center 9/11 Attack
 0.5: Khobar Towers Bombing, U.S. Embassy Bombing--Tanzania
 0.5: Khobar Towers Bombing, Pentagon Attack
 0.5: Khobar Towers Bombing, Luxor Massacre

A9. Pairs of group names with GEP ≥ 3

Percentage of Total: 41.8182 %

Number of Pairs: 23

1: Moro Islamic Liberation Front, Jemaah Islamiyah
 1: Jaamat al-Islamie, Moro Islamic Liberation Front
 1: Jaamat al-Islamie, Jemaah Islamiyah
 1: Jaamat al-Islamie, Abu Sayyaf
 1: Abu Sayyaf, Moro Islamic Liberation Front
 1: Abu Sayyaf, Jemaah Islamiyah
 0.83: Shura Council of al-Qaeda, Egyptian Islamic Jihad
 0.83: Egyptian Islamic Jihad, al Jihad
 0.83: Al-Gama'a al-Islamiyya, Shura Council of al-Qaeda
 0.71: Al-Gama'a al-Islamiyya, Egyptian Islamic Jihad
 0.67: Shura Council of al-Qaeda, al Jihad
 0.57: Al-Gama'a al-Islamiyya, al Jihad
 0.5: Islamic Army of Aden, al Jihad
 0.46: al-Qaeda, Egyptian Islamic Jihad
 0.46: al-Qaeda, Al-Gama'a al-Islamiyya
 0.43: Islamic Army of Aden, Egyptian Islamic Jihad
 0.4: Shura Council of al-Qaeda, Libyan Islamic Fighting Group

0.4: Libyan Islamic Fighting Group, al Jihad
0.38: al-Qaeda, Shura Council of al-Qaeda
0.38: al-Qaeda, al Jihad
0.33: Egyptian Islamic Jihad, Libyan Islamic Fighting Group
0.33: Al-Gama'a al-Islamiyya, Libyan Islamic Fighting Group
0.31: al-Qaeda, Islamic Army of Aden

A10. Pairs of group names with transitive closure of GEP ≥ 3

Percentage of Total: 49.0909 %

Number of Pairs: 27

1: Moro Islamic Liberation Front, Jemaah Islamiyah
1: Jaamat al-Islamie, Moro Islamic Liberation Front
1: Jaamat al-Islamie, Jemaah Islamiyah
1: Jaamat al-Islamie, Abu Sayyaf
1: Abu Sayyaf, Moro Islamic Liberation Front
1: Abu Sayyaf, Jemaah Islamiyah
0.83: Shura Council of al-Qaeda, Egyptian Islamic Jihad
0.83: Shura Council of al-Qaeda, al Jihad
0.83: Egyptian Islamic Jihad, al Jihad
0.83: Al-Gama'a al-Islamiyya, Shura Council of al-Qaeda
0.83: Al-Gama'a al-Islamiyya, Egyptian Islamic Jihad
0.83: Al-Gama'a al-Islamiyya, al Jihad
0.5: Islamic Army of Aden, Shura Council of al-Qaeda
0.5: Islamic Army of Aden, Egyptian Islamic Jihad
0.5: Islamic Army of Aden, Al-Gama'a al-Islamiyya
0.5: Islamic Army of Aden, al Jihad
0.46: al-Qaeda, Shura Council of al-Qaeda
0.46: al-Qaeda, Islamic Army of Aden
0.46: al-Qaeda, Egyptian Islamic Jihad
0.46: al-Qaeda, Al-Gama'a al-Islamiyya
0.46: al-Qaeda, al Jihad
0.4: Shura Council of al-Qaeda, Libyan Islamic Fighting Group
0.4: Libyan Islamic Fighting Group, al Jihad
0.4: Islamic Army of Aden, Libyan Islamic Fighting Group
0.4: Egyptian Islamic Jihad, Libyan Islamic Fighting Group
0.4: al-Qaeda, Libyan Islamic Fighting Group
0.4: Al-Gama'a al-Islamiyya, Libyan Islamic Fighting Group

A11. Pairs of events with EPP ≥ 3

Percentage of Total: 5.1282 %

Number of Pairs: 4

1: Pennsylvania Flight, Pentagon Attack
0.94: U.S. Embassy Bombing--Kenya, U.S. Embassy Bombing--Tanzania
0.87: World Trade Center 9/11 Attack, Pentagon Attack
0.87: Pennsylvania Flight, World Trade Center 9/11 Attack

A12. Pairs of events with transitive closure of EPP ≥ 3

Percentage of Total: 5.1282 %

Number of Pairs: 4

- 1: Pennsylvania Flight, Pentagon Attack
- 0.94: U.S. Embassy Bombing--Kenya, U.S. Embassy Bombing--Tanzania
- 0.87: World Trade Center 9/11 Attack, Pentagon Attack
- 0.87: Pennsylvania Flight, World Trade Center 9/11 Attack

A13. Pairs of people names with PEP ≥ 3 **Percentage of Total: 29.8824 %****Number of Pairs: 381**

- 1: Ziad Samir Jarrah, Zacarias Moussaoui
- 1: Ziad Samir Jarrah, Mohammed Haydar Zammar
- 1: Ziad Samir Jarrah, Majed Moqed
- 1: Zacarias Moussaoui, Mohammed Haydar Zammar
- 1: Yunus Moklis, Ustadz Nur Mohammed Umog
- 1: Waleed M. Alshehri, Ziad Samir Jarrah
- 1: Waleed M. Alshehri, Zacarias Moussaoui
- 1: Waleed M. Alshehri, Mohammed Haydar Zammar
- 1: Waleed M. Alshehri, Mohammed Atta
- 1: Waleed M. Alshehri, Majed Moqed
- 1: Waleed M. Alshehri, Hani Hanjour
- 1: Wail M. Alshehri, Ziad Samir Jarrah
- 1: Wail M. Alshehri, Zacarias Moussaoui
- 1: Wail M. Alshehri, Waleed M. Alshehri
- 1: Wail M. Alshehri, Mohand Alshehri
- 1: Wail M. Alshehri, Mohammed Haydar Zammar
- 1: Wail M. Alshehri, Mohammed Atta
- 1: Wail M. Alshehri, Majed Moqed
- 1: Wail M. Alshehri, Hani Hanjour
- 1: Satam M.A. Al Suqami, Ziad Samir Jarrah
- 1: Satam M.A. Al Suqami, Zacarias Moussaoui
- 1: Satam M.A. Al Suqami, Waleed M. Alshehri
- 1: Satam M.A. Al Suqami, Wail M. Alshehri
- 1: Satam M.A. Al Suqami, Salem Alhazmi
- 1: Satam M.A. Al Suqami, Saeed Alghamdi
- 1: Satam M.A. Al Suqami, Nawaf Alhazmi
- 1: Satam M.A. Al Suqami, Mohand Alshehri
- 1: Satam M.A. Al Suqami, Mohammed Haydar Zammar
- 1: Satam M.A. Al Suqami, Mohammed Atta
- 1: Satam M.A. Al Suqami, Majed Moqed
- 1: Satam M.A. Al Suqami, Hani Hanjour
- 1: Satam M.A. Al Suqami, Hamza Alghamdi
- 1: Satam M.A. Al Suqami, Ahmed Alnami
- 1: Satam M.A. Al Suqami, Ahmed Alghamdi
- 1: Satam M.A. Al Suqami, Abdulaziz Alomari
- 1: Salem Alhazmi, Ziad Samir Jarrah
- 1: Salem Alhazmi, Zacarias Moussaoui
- 1: Salem Alhazmi, Waleed M. Alshehri
- 1: Salem Alhazmi, Wail M. Alshehri
- 1: Salem Alhazmi, Mohand Alshehri
- 1: Salem Alhazmi, Mohammed Haydar Zammar
- 1: Salem Alhazmi, Mohammed Atta

1: Salem Alhazmi, Majed Moqed
 1: Salem Alhazmi, Hani Hanjour
 1: Salem Alhazmi, Ahmed Alnami
 1: Salem Alhazmi, Abdulaziz Alomari
 1: Saeed Alghamdi, Ziad Samir Jarrah
 1: Saeed Alghamdi, Zacarias Moussaoui
 1: Saeed Alghamdi, Waleed M. Alshehri
 1: Saeed Alghamdi, Wail M. Alshehri
 1: Saeed Alghamdi, Salem Alhazmi
 1: Saeed Alghamdi, Nawaf Alhazmi
 1: Saeed Alghamdi, Mohand Alshehri
 1: Saeed Alghamdi, Mohammed Haydar Zammar
 1: Saeed Alghamdi, Mohammed Atta
 1: Saeed Alghamdi, Majed Moqed
 1: Saeed Alghamdi, Hani Hanjour
 1: Saeed Alghamdi, Ahmed Alnami
 1: Saeed Alghamdi, Abdulaziz Alomari
 1: Peter Kinyanjui, Sheikh Ahmed Salim Swedan
 1: Peter Kinyanjui, Fazul Abdullah Mohammed
 1: Peter Kinyanjui, Fahid Mohammed Ally Msalam
 1: Omar Abd al-Rahman, Ahmed Omar Abdel Rahman
 1: Omar Abd al-Rahman, Abdul Rahman Yasin
 1: Nizar Ben Mohammed Nawar, Mouhamedou Ould Slehi
 1: Nawaf Alhazmi, Ziad Samir Jarrah
 1: Nawaf Alhazmi, Zacarias Moussaoui
 1: Nawaf Alhazmi, Waleed M. Alshehri
 1: Nawaf Alhazmi, Wail M. Alshehri
 1: Nawaf Alhazmi, Salem Alhazmi
 1: Nawaf Alhazmi, Mohand Alshehri
 1: Nawaf Alhazmi, Mohammed Haydar Zammar
 1: Nawaf Alhazmi, Mohammed Atta
 1: Nawaf Alhazmi, Majed Moqed
 1: Nawaf Alhazmi, Hani Hanjour
 1: Nawaf Alhazmi, Ahmed Alnami
 1: Nawaf Alhazmi, Abdulaziz Alomari
 1: Mustafa Mohamed Fadhil, Sheikh Ahmed Salim Swedan
 1: Mustafa Mohamed Fadhil, Peter Kinyanjui
 1: Mustafa Mohamed Fadhil, Fazul Abdullah Mohammed
 1: Mustafa Mohamed Fadhil, Fahid Mohammed Ally Msalam
 1: Mustafa Mohamed Fadhil, Ahmed Mohammed Hamed Ali
 1: Mustafa Mohamed Fadhil, Ahmed Khalfan Ghailani
 1: Muhsin Musa Matwalli Atwah, Sheikh Ahmed Salim Swedan
 1: Muhsin Musa Matwalli Atwah, Peter Kinyanjui
 1: Muhsin Musa Matwalli Atwah, Mustafa Mohamed Fadhil
 1: Muhsin Musa Matwalli Atwah, Fazul Abdullah Mohammed
 1: Muhsin Musa Matwalli Atwah, Fahid Mohammed Ally Msalam
 1: Muhsin Musa Matwalli Atwah, Ahmed Mohammed Hamed Ali
 1: Muhsin Musa Matwalli Atwah, Ahmed Khalfan Ghailani
 1: Muhsin Musa Matwalli Atwah, Ahmed Brahim
 1: Mohand Alshehri, Ziad Samir Jarrah
 1: Mohand Alshehri, Zacarias Moussaoui
 1: Mohand Alshehri, Waleed M. Alshehri

1: Mohand Alshehri, Mohammed Haydar Zammar
 1: Mohand Alshehri, Mohammed Atta
 1: Mohand Alshehri, Majed Moqed
 1: Mohand Alshehri, Hani Hanjour
 1: Mohammed Atta, Ziad Samir Jarrah
 1: Mohammed Atta, Zacarias Moussaoui
 1: Mohammed Atta, Mohammed Haydar Zammar
 1: Mohammed Atta, Majed Moqed
 1: Mohammed Atta, Hani Hanjour
 1: Marwan Al-Shehhi, Ziad Samir Jarrah
 1: Marwan Al-Shehhi, Zacarias Moussaoui
 1: Marwan Al-Shehhi, Waleed M. Alshehri
 1: Marwan Al-Shehhi, Wail M. Alshehri
 1: Marwan Al-Shehhi, Satam M.A. Al Suqami
 1: Marwan Al-Shehhi, Salem Alhazmi
 1: Marwan Al-Shehhi, Saeed Alghamdi
 1: Marwan Al-Shehhi, Nawaf Alhazmi
 1: Marwan Al-Shehhi, Mohand Alshehri
 1: Marwan Al-Shehhi, Mohammed Haydar Zammar
 1: Marwan Al-Shehhi, Mohammed Atta
 1: Marwan Al-Shehhi, Majed Moqed
 1: Marwan Al-Shehhi, Hani Hanjour
 1: Marwan Al-Shehhi, Hamza Alghamdi
 1: Marwan Al-Shehhi, Ahmed Ibrahim A. Al Haznawi
 1: Marwan Al-Shehhi, Ahmed Alnami
 1: Marwan Al-Shehhi, Ahmed Alghamdi
 1: Marwan Al-Shehhi, Abdulaziz Alomari
 1: Majed Moqed, Zacarias Moussaoui
 1: Majed Moqed, Mohammed Haydar Zammar
 1: Hani Hanjour, Ziad Samir Jarrah
 1: Hani Hanjour, Zacarias Moussaoui
 1: Hani Hanjour, Mohammed Haydar Zammar
 1: Hani Hanjour, Majed Moqed
 1: Hamza Alghamdi, Ziad Samir Jarrah
 1: Hamza Alghamdi, Zacarias Moussaoui
 1: Hamza Alghamdi, Waleed M. Alshehri
 1: Hamza Alghamdi, Wail M. Alshehri
 1: Hamza Alghamdi, Salem Alhazmi
 1: Hamza Alghamdi, Saeed Alghamdi
 1: Hamza Alghamdi, Nawaf Alhazmi
 1: Hamza Alghamdi, Mohand Alshehri
 1: Hamza Alghamdi, Mohammed Haydar Zammar
 1: Hamza Alghamdi, Mohammed Atta
 1: Hamza Alghamdi, Majed Moqed
 1: Hamza Alghamdi, Hani Hanjour
 1: Hamza Alghamdi, Ahmed Alnami
 1: Hamza Alghamdi, Abdulaziz Alomari
 1: Fazul Abdullah Mohammed, Sheikh Ahmed Salim Swedan
 1: Fazul Abdullah Mohammed, Fahid Mohammed Ally Msalam
 1: Fathur Rohman al-Ghozi, Yunus Moklis
 1: Fathur Rohman al-Ghozi, Ustadz Nur Mohammed Umog
 1: Fathur Rohman al-Ghozi, Faiz Abu Bakar Bafana

1: Faiz Abu Bakar Bafana, Yunus Moklis
 1: Faiz Abu Bakar Bafana, Ustadz Nur Mohammed Umog
 1: Fahid Mohammed Ally Msalam, Sheikh Ahmed Salim Swedan
 1: Christian Manfred G., Nizar Ben Mohammed Nawar
 1: Christian Manfred G., Mouhamedou Ould Slehi
 1: Anas al-Liby, Sheikh Ahmed Salim Swedan
 1: Anas al-Liby, Peter Kinyanjui
 1: Anas al-Liby, Mustafa Mohamed Fadhil
 1: Anas al-Liby, Muhsin Musa Matwalli Atwah
 1: Anas al-Liby, Fazul Abdullah Mohammed
 1: Anas al-Liby, Fahid Mohammed Ally Msalam
 1: Anas al-Liby, Ahmed Mohammed Hamed Ali
 1: Anas al-Liby, Ahmed Khalfan Ghailani
 1: Anas al-Liby, Ahmed Ibrahim
 1: Ahmed Omar Abdel Rahman, Abdul Rahman Yasin
 1: Ahmed Mohammed Hamed Ali, Sheikh Ahmed Salim Swedan
 1: Ahmed Mohammed Hamed Ali, Peter Kinyanjui
 1: Ahmed Mohammed Hamed Ali, Fazul Abdullah Mohammed
 1: Ahmed Mohammed Hamed Ali, Fahid Mohammed Ally Msalam
 1: Ahmed Khalfan Ghailani, Sheikh Ahmed Salim Swedan
 1: Ahmed Khalfan Ghailani, Peter Kinyanjui
 1: Ahmed Khalfan Ghailani, Fazul Abdullah Mohammed
 1: Ahmed Khalfan Ghailani, Fahid Mohammed Ally Msalam
 1: Ahmed Khalfan Ghailani, Ahmed Mohammed Hamed Ali
 1: Ahmed Ibrahim A. Al Haznawi, Ziad Samir Jarrah
 1: Ahmed Ibrahim A. Al Haznawi, Zacarias Moussaoui
 1: Ahmed Ibrahim A. Al Haznawi, Waleed M. Alshehri
 1: Ahmed Ibrahim A. Al Haznawi, Wail M. Alshehri
 1: Ahmed Ibrahim A. Al Haznawi, Satam M.A. Al Suqami
 1: Ahmed Ibrahim A. Al Haznawi, Salem Alhazmi
 1: Ahmed Ibrahim A. Al Haznawi, Saeed Alghamdi
 1: Ahmed Ibrahim A. Al Haznawi, Nawaf Alhazmi
 1: Ahmed Ibrahim A. Al Haznawi, Mohand Alshehri
 1: Ahmed Ibrahim A. Al Haznawi, Mohammed Haydar Zammar
 1: Ahmed Ibrahim A. Al Haznawi, Mohammed Atta
 1: Ahmed Ibrahim A. Al Haznawi, Majed Moqed
 1: Ahmed Ibrahim A. Al Haznawi, Hani Hanjour
 1: Ahmed Ibrahim A. Al Haznawi, Hamza Alghamdi
 1: Ahmed Ibrahim A. Al Haznawi, Ahmed Alnami
 1: Ahmed Ibrahim A. Al Haznawi, Ahmed Alghamdi
 1: Ahmed Ibrahim A. Al Haznawi, Abdulaziz Alomari
 1: Ahmed Ibrahim A. Al Haznawi, Sheikh Ahmed Salim Swedan
 1: Ahmed Ibrahim A. Al Haznawi, Peter Kinyanjui
 1: Ahmed Ibrahim A. Al Haznawi, Mustafa Mohamed Fadhil
 1: Ahmed Ibrahim A. Al Haznawi, Fazul Abdullah Mohammed
 1: Ahmed Ibrahim A. Al Haznawi, Fahid Mohammed Ally Msalam
 1: Ahmed Ibrahim A. Al Haznawi, Ahmed Mohammed Hamed Ali
 1: Ahmed Ibrahim A. Al Haznawi, Ahmed Khalfan Ghailani
 1: Ahmed Ibrahim A. Al Haznawi, Ziad Samir Jarrah
 1: Ahmed Ibrahim A. Al Haznawi, Zacarias Moussaoui
 1: Ahmed Ibrahim A. Al Haznawi, Waleed M. Alshehri
 1: Ahmed Ibrahim A. Al Haznawi, Wail M. Alshehri

1: Ahmed Alnami, Mohand Alshehri
 1: Ahmed Alnami, Mohammed Haydar Zammar
 1: Ahmed Alnami, Mohammed Atta
 1: Ahmed Alnami, Majed Moqed
 1: Ahmed Alnami, Hani Hanjour
 1: Ahmed Alnami, Abdulaziz Alomari
 1: Ahmed Alghamdi, Ziad Samir Jarrah
 1: Ahmed Alghamdi, Zacarias Moussaoui
 1: Ahmed Alghamdi, Waleed M. Alshehri
 1: Ahmed Alghamdi, Wail M. Alshehri
 1: Ahmed Alghamdi, Salem Alhazmi
 1: Ahmed Alghamdi, Saeed Alghamdi
 1: Ahmed Alghamdi, Nawaf Alhazmi
 1: Ahmed Alghamdi, Mohand Alshehri
 1: Ahmed Alghamdi, Mohammed Haydar Zammar
 1: Ahmed Alghamdi, Mohammed Atta
 1: Ahmed Alghamdi, Majed Moqed
 1: Ahmed Alghamdi, Hani Hanjour
 1: Ahmed Alghamdi, Hamza Alghamdi
 1: Ahmed Alghamdi, Ahmed Alnami
 1: Ahmed Alghamdi, Abdulaziz Alomari
 1: Abdullah Ahmed Abdullah, Sheikh Ahmed Salim Swedan
 1: Abdullah Ahmed Abdullah, Peter Kinyanjui
 1: Abdullah Ahmed Abdullah, Mustafa Mohamed Fadhil
 1: Abdullah Ahmed Abdullah, Muhsin Musa Matwalli Atwah
 1: Abdullah Ahmed Abdullah, Fazul Abdullah Mohammed
 1: Abdullah Ahmed Abdullah, Fahid Mohammed Ally Msalam
 1: Abdullah Ahmed Abdullah, Anas al-Liby
 1: Abdullah Ahmed Abdullah, Ahmed Mohammed Hamed Ali
 1: Abdullah Ahmed Abdullah, Ahmed Khalfan Ghailani
 1: Abdullah Ahmed Abdullah, Ahmed Brahim
 1: Abdulaziz Alomari, Ziad Samir Jarrah
 1: Abdulaziz Alomari, Zacarias Moussaoui
 1: Abdulaziz Alomari, Waleed M. Alshehri
 1: Abdulaziz Alomari, Wail M. Alshehri
 1: Abdulaziz Alomari, Mohand Alshehri
 1: Abdulaziz Alomari, Mohammed Haydar Zammar
 1: Abdulaziz Alomari, Mohammed Atta
 1: Abdulaziz Alomari, Majed Moqed
 1: Abdulaziz Alomari, Hani Hanjour
 0.8: Ayman Mohammed Rabie al-Zawahiri, Muhammad Atef
 0.75: Satam M.A. Al Suqami, Khalid Almihdhar
 0.75: Salem Alhazmi, Khalid Almihdhar
 0.75: Saeed Alghamdi, Khalid Almihdhar
 0.75: Nawaf Alhazmi, Khalid Almihdhar
 0.75: Marwan Al-Shehhi, Khalid Almihdhar
 0.75: Khalid Almihdhar, Ziad Samir Jarrah
 0.75: Khalid Almihdhar, Zacarias Moussaoui
 0.75: Khalid Almihdhar, Waleed M. Alshehri
 0.75: Khalid Almihdhar, Wail M. Alshehri
 0.75: Khalid Almihdhar, Mohand Alshehri
 0.75: Khalid Almihdhar, Mohammed Haydar Zammar

0.75: Khalid Almihdhar, Mohammed Atta
 0.75: Khalid Almihdhar, Majed Moqed
 0.75: Khalid Almihdhar, Hani Hanjour
 0.75: Khalid Almihdhar, Ahmed Alnami
 0.75: Khalid Almihdhar, Abdulaziz Alomari
 0.75: Hamza Alghamdi, Khalid Almihdhar
 0.75: Ahmed Ibrahim A. Al Haznawi, Khalid Almihdhar
 0.75: Ahmed Alghamdi, Khalid Almihdhar
 0.67: Osama Bin Laden, Sheikh Ahmed Salim Swedan
 0.67: Osama Bin Laden, Peter Kinyanjui
 0.67: Osama Bin Laden, Mustafa Mohamed Fadhil
 0.67: Osama Bin Laden, Fazul Abdullah Mohammed
 0.67: Osama Bin Laden, Fahid Mohammed Ally Msalam
 0.67: Osama Bin Laden, Ahmed Mohammed Hamed Ali
 0.67: Osama Bin Laden, Ahmed Khalfan Ghailani
 0.67: Osama Bin Laden, Ahmed Brahim
 0.67: Muhsin Musa Matwalli Atwah, Osama Bin Laden
 0.67: Khalid al-Shanqiti, Sheikh Ahmed Salim Swedan
 0.67: Khalid al-Shanqiti, Peter Kinyanjui
 0.67: Khalid al-Shanqiti, Mustafa Mohamed Fadhil
 0.67: Khalid al-Shanqiti, Muhsin Musa Matwalli Atwah
 0.67: Khalid al-Shanqiti, Fazul Abdullah Mohammed
 0.67: Khalid al-Shanqiti, Fahid Mohammed Ally Msalam
 0.67: Khalid al-Shanqiti, Ahmed Mohammed Hamed Ali
 0.67: Khalid al-Shanqiti, Ahmed Khalfan Ghailani
 0.67: Khalid al-Shanqiti, Ahmed Brahim
 0.67: Anas al-Liby, Osama Bin Laden
 0.67: Anas al-Liby, Khalid al-Shanqiti
 0.67: Abdullah Ahmed Abdullah, Osama Bin Laden
 0.67: Abdullah Ahmed Abdullah, Khalid al-Shanqiti
 0.5: Mustafa Mohamed Fadhil, Khalid al Fawwaz
 0.5: Muhsin Musa Matwalli Atwah, Khalid al Fawwaz
 0.5: Muhammad Atef, Sheikh Ahmed Salim Swedan
 0.5: Muhammad Atef, Peter Kinyanjui
 0.5: Muhammad Atef, Mustafa Mohamed Fadhil
 0.5: Muhammad Atef, Muhsin Musa Matwalli Atwah
 0.5: Muhammad Atef, Fazul Abdullah Mohammed
 0.5: Muhammad Atef, Fahid Mohammed Ally Msalam
 0.5: Muhammad Atef, Ahmed Mohammed Hamed Ali
 0.5: Muhammad Atef, Ahmed Khalfan Ghailani
 0.5: Muhammad Atef, Ahmed Brahim
 0.5: Khalid al-Shanqiti, Osama Bin Laden
 0.5: Khalid al Fawwaz, Sheikh Ahmed Salim Swedan
 0.5: Khalid al Fawwaz, Peter Kinyanjui
 0.5: Khalid al Fawwaz, Fazul Abdullah Mohammed
 0.5: Khalid al Fawwaz, Fahid Mohammed Ally Msalam
 0.5: Khalid al Fawwaz, Ahmed Mohammed Hamed Ali
 0.5: Khalid al Fawwaz, Ahmed Khalfan Ghailani
 0.5: Anas al-Liby, Muhammad Atef
 0.5: Anas al-Liby, Khalid al Fawwaz
 0.5: Ahmed Brahim, Khalid al Fawwaz
 0.5: Abdullah Ahmed Abdullah, Muhammad Atef

0.5: Abdullah Ahmed Abdullah, Khalid al Fawwaz
 0.4: Waleed M. Alshehri, Muhammad Atef
 0.4: Wail M. Alshehri, Muhammad Atef
 0.4: Satam M.A. Al Suqami, Muhammad Atef
 0.4: Salem Alhazmi, Muhammad Atef
 0.4: Saeed Alghamdi, Muhammad Atef
 0.4: Nawaf Alhazmi, Muhammad Atef
 0.4: Muhammad Atef, Ziad Samir Jarrah
 0.4: Muhammad Atef, Zacarias Moussaoui
 0.4: Muhammad Atef, Osama Bin Laden
 0.4: Muhammad Atef, Mohammed Haydar Zammar
 0.4: Muhammad Atef, Mohammed Atta
 0.4: Muhammad Atef, Majed Moqed
 0.4: Muhammad Atef, Hani Hanjour
 0.4: Mohand Alshehri, Muhammad Atef
 0.4: Marwan Al-Shehhi, Muhammad Atef
 0.4: Khalid al-Shanqiti, Muhammad Atef
 0.4: Hamza Alghamdi, Muhammad Atef
 0.4: Ayman Mohammed Rabie al-Zawahiri, Sheikh Ahmed Salim Swedan
 0.4: Ayman Mohammed Rabie al-Zawahiri, Peter Kinyanjui
 0.4: Ayman Mohammed Rabie al-Zawahiri, Mustafa Mohamed Fadhil
 0.4: Ayman Mohammed Rabie al-Zawahiri, Muhsin Musa Matwalli Atwah
 0.4: Ayman Mohammed Rabie al-Zawahiri, Fazul Abdullah Mohammed
 0.4: Ayman Mohammed Rabie al-Zawahiri, Fahid Mohammed Ally Msalam
 0.4: Ayman Mohammed Rabie al-Zawahiri, Ahmed Mohammed Hamed Ali
 0.4: Ayman Mohammed Rabie al-Zawahiri, Ahmed Khalfan Ghailani
 0.4: Ayman Mohammed Rabie al-Zawahiri, Ahmed Brahim
 0.4: Anas al-Liby, Ayman Mohammed Rabie al-Zawahiri
 0.4: Ahmed Ibrahim A. Al Haznawi, Muhammad Atef
 0.4: Ahmed Alnami, Muhammad Atef
 0.4: Ahmed Alghamdi, Muhammad Atef
 0.4: Abdullah Ahmed Abdullah, Ayman Mohammed Rabie al-Zawahiri
 0.4: Abdulaziz Alomari, Muhammad Atef
 0.33: Waleed M. Alshehri, Raed Hijazi
 0.33: Wail M. Alshehri, Raed Hijazi
 0.33: Satam M.A. Al Suqami, Raed Hijazi
 0.33: Salem Alhazmi, Raed Hijazi
 0.33: Saeed Alghamdi, Raed Hijazi
 0.33: Raed Hijazi, Ziad Samir Jarrah
 0.33: Raed Hijazi, Zacarias Moussaoui
 0.33: Raed Hijazi, Mohammed Haydar Zammar
 0.33: Raed Hijazi, Majed Moqed
 0.33: Osama Bin Laden, Khalid al Fawwaz
 0.33: Nawaf Alhazmi, Raed Hijazi
 0.33: Mohand Alshehri, Raed Hijazi
 0.33: Mohammed Atta, Raed Hijazi
 0.33: Marwan Al-Shehhi, Raed Hijazi
 0.33: Marwan Al-Shehhi, Ayman Mohammed Rabie al-Zawahiri
 0.33: Khalid al-Shanqiti, Nizar Ben Mohammed Nawar
 0.33: Khalid al-Shanqiti, Mouhamedou Ould Slehi
 0.33: Khalid al-Shanqiti, Khalid al Fawwaz
 0.33: Khalid al-Shanqiti, Christian Manfred G.

0.33: Khalid al-Shanqiti, Ayman Mohammed Rabie al-Zawahiri
0.33: Khalid Almihdhar, Muhammad Atef
0.33: Hani Hanjour, Raed Hijazi
0.33: Hamza Alghamdi, Raed Hijazi
0.33: Ayman Mohammed Rabie al-Zawahiri, Ziad Samir Jarrah
0.33: Ayman Mohammed Rabie al-Zawahiri, Zacarias Moussaoui
0.33: Ayman Mohammed Rabie al-Zawahiri, Waleed M. Alshehri
0.33: Ayman Mohammed Rabie al-Zawahiri, Wail M. Alshehri
0.33: Ayman Mohammed Rabie al-Zawahiri, Satam M.A. Al Suqami
0.33: Ayman Mohammed Rabie al-Zawahiri, Salem Alhazmi
0.33: Ayman Mohammed Rabie al-Zawahiri, Saeed Alghamdi
0.33: Ayman Mohammed Rabie al-Zawahiri, Osama Bin Laden
0.33: Ayman Mohammed Rabie al-Zawahiri, Nawaf Alhazmi
0.33: Ayman Mohammed Rabie al-Zawahiri, Mohand Alshehri
0.33: Ayman Mohammed Rabie al-Zawahiri, Mohammed Haydar Zammar
0.33: Ayman Mohammed Rabie al-Zawahiri, Mohammed Atta
0.33: Ayman Mohammed Rabie al-Zawahiri, Majed Moqed
0.33: Ayman Mohammed Rabie al-Zawahiri, Hani Hanjour
0.33: Ayman Mohammed Rabie al-Zawahiri, Hamza Alghamdi
0.33: Ayman Mohammed Rabie al-Zawahiri, Ahmed Ibrahim A. Al Haznawi
0.33: Ayman Mohammed Rabie al-Zawahiri, Ahmed Alnami
0.33: Ayman Mohammed Rabie al-Zawahiri, Ahmed Alghamdi
0.33: Ayman Mohammed Rabie al-Zawahiri, Abdulaziz Alomari
0.33: Ahmed Ibrahim A. Al Haznawi, Raed Hijazi
0.33: Ahmed Alnami, Raed Hijazi
0.33: Ahmed Alghamdi, Raed Hijazi
0.33: Abdulaziz Alomari, Raed Hijazi

A14. Pairs of people names with transitive closure of PEP ≥ 3

Percentage of Total: 61.8824 %

Number of Pairs: 789

1: Ziad Samir Jarrah, Zacarias Moussaoui
1: Ziad Samir Jarrah, Mohammed Haydar Zammar
1: Ziad Samir Jarrah, Majed Moqed
1: Zacarias Moussaoui, Mohammed Haydar Zammar
1: Yunus Moklis, Ustadz Nur Mohammed Umog
1: Waleed M. Alshehri, Ziad Samir Jarrah
1: Waleed M. Alshehri, Zacarias Moussaoui
1: Waleed M. Alshehri, Mohammed Haydar Zammar
1: Waleed M. Alshehri, Mohammed Atta
1: Waleed M. Alshehri, Majed Moqed
1: Waleed M. Alshehri, Hani Hanjour
1: Wail M. Alshehri, Ziad Samir Jarrah
1: Wail M. Alshehri, Zacarias Moussaoui
1: Wail M. Alshehri, Waleed M. Alshehri
1: Wail M. Alshehri, Mohand Alshehri
1: Wail M. Alshehri, Mohammed Haydar Zammar
1: Wail M. Alshehri, Mohammed Atta
1: Wail M. Alshehri, Majed Moqed
1: Wail M. Alshehri, Hani Hanjour
1: Satam M.A. Al Suqami, Ziad Samir Jarrah

1: Satam M.A. Al Suqami, Zacarias Moussaoui
 1: Satam M.A. Al Suqami, Waleed M. Alshehri
 1: Satam M.A. Al Suqami, Wail M. Alshehri
 1: Satam M.A. Al Suqami, Salem Alhazmi
 1: Satam M.A. Al Suqami, Saeed Alghamdi
 1: Satam M.A. Al Suqami, Nawaf Alhazmi
 1: Satam M.A. Al Suqami, Mohand Alshehri
 1: Satam M.A. Al Suqami, Mohammed Haydar Zammar
 1: Satam M.A. Al Suqami, Mohammed Atta
 1: Satam M.A. Al Suqami, Majed Moqed
 1: Satam M.A. Al Suqami, Hani Hanjour
 1: Satam M.A. Al Suqami, Hamza Alghamdi
 1: Satam M.A. Al Suqami, Ahmed Alnami
 1: Satam M.A. Al Suqami, Ahmed Alghamdi
 1: Satam M.A. Al Suqami, Abdulaziz Alomari
 1: Salem Alhazmi, Ziad Samir Jarrah
 1: Salem Alhazmi, Zacarias Moussaoui
 1: Salem Alhazmi, Waleed M. Alshehri
 1: Salem Alhazmi, Wail M. Alshehri
 1: Salem Alhazmi, Mohand Alshehri
 1: Salem Alhazmi, Mohammed Haydar Zammar
 1: Salem Alhazmi, Mohammed Atta
 1: Salem Alhazmi, Majed Moqed
 1: Salem Alhazmi, Hani Hanjour
 1: Salem Alhazmi, Ahmed Alnami
 1: Salem Alhazmi, Abdulaziz Alomari
 1: Saeed Alghamdi, Ziad Samir Jarrah
 1: Saeed Alghamdi, Zacarias Moussaoui
 1: Saeed Alghamdi, Waleed M. Alshehri
 1: Saeed Alghamdi, Wail M. Alshehri
 1: Saeed Alghamdi, Salem Alhazmi
 1: Saeed Alghamdi, Nawaf Alhazmi
 1: Saeed Alghamdi, Mohand Alshehri
 1: Saeed Alghamdi, Mohammed Haydar Zammar
 1: Saeed Alghamdi, Mohammed Atta
 1: Saeed Alghamdi, Majed Moqed
 1: Saeed Alghamdi, Hani Hanjour
 1: Saeed Alghamdi, Ahmed Alnami
 1: Saeed Alghamdi, Abdulaziz Alomari
 1: Peter Kinyanjui, Sheikh Ahmed Salim Swedan
 1: Peter Kinyanjui, Fazul Abdullah Mohammed
 1: Peter Kinyanjui, Fahid Mohammed Ally Msalam
 1: Omar Abd al-Rahman, Ahmed Omar Abdel Rahman
 1: Omar Abd al-Rahman, Abdul Rahman Yasin
 1: Nizar Ben Mohammed Nawar, Mouhamedou Ould Slehi
 1: Nawaf Alhazmi, Ziad Samir Jarrah
 1: Nawaf Alhazmi, Zacarias Moussaoui
 1: Nawaf Alhazmi, Waleed M. Alshehri
 1: Nawaf Alhazmi, Wail M. Alshehri
 1: Nawaf Alhazmi, Salem Alhazmi
 1: Nawaf Alhazmi, Mohand Alshehri
 1: Nawaf Alhazmi, Mohammed Haydar Zammar

1: Nawaf Alhazmi, Mohammed Atta
 1: Nawaf Alhazmi, Majed Moqed
 1: Nawaf Alhazmi, Hani Hanjour
 1: Nawaf Alhazmi, Ahmed Alnami
 1: Nawaf Alhazmi, Abdulaziz Alomari
 1: Mustafa Mohamed Fadhil, Sheikh Ahmed Salim Swedan
 1: Mustafa Mohamed Fadhil, Peter Kinyanjui
 1: Mustafa Mohamed Fadhil, Fazul Abdullah Mohammed
 1: Mustafa Mohamed Fadhil, Fahid Mohammed Ally Msalam
 1: Mustafa Mohamed Fadhil, Ahmed Mohammed Hamed Ali
 1: Mustafa Mohamed Fadhil, Ahmed Khalfan Ghailani
 1: Muhsin Musa Matwalli Atwah, Sheikh Ahmed Salim Swedan
 1: Muhsin Musa Matwalli Atwah, Peter Kinyanjui
 1: Muhsin Musa Matwalli Atwah, Mustafa Mohamed Fadhil
 1: Muhsin Musa Matwalli Atwah, Fazul Abdullah Mohammed
 1: Muhsin Musa Matwalli Atwah, Fahid Mohammed Ally Msalam
 1: Muhsin Musa Matwalli Atwah, Ahmed Mohammed Hamed Ali
 1: Muhsin Musa Matwalli Atwah, Ahmed Khalfan Ghailani
 1: Muhsin Musa Matwalli Atwah, Ahmed Ibrahim
 1: Mohand Alshehri, Ziad Samir Jarrah
 1: Mohand Alshehri, Zacarias Moussaoui
 1: Mohand Alshehri, Waleed M. Alshehri
 1: Mohand Alshehri, Mohammed Haydar Zammar
 1: Mohand Alshehri, Mohammed Atta
 1: Mohand Alshehri, Majed Moqed
 1: Mohand Alshehri, Hani Hanjour
 1: Mohammed Atta, Ziad Samir Jarrah
 1: Mohammed Atta, Zacarias Moussaoui
 1: Mohammed Atta, Mohammed Haydar Zammar
 1: Mohammed Atta, Majed Moqed
 1: Mohammed Atta, Hani Hanjour
 1: Marwan Al-Shehhi, Ziad Samir Jarrah
 1: Marwan Al-Shehhi, Zacarias Moussaoui
 1: Marwan Al-Shehhi, Waleed M. Alshehri
 1: Marwan Al-Shehhi, Wail M. Alshehri
 1: Marwan Al-Shehhi, Satam M.A. Al Suqami
 1: Marwan Al-Shehhi, Salem Alhazmi
 1: Marwan Al-Shehhi, Saeed Alghamdi
 1: Marwan Al-Shehhi, Nawaf Alhazmi
 1: Marwan Al-Shehhi, Mohand Alshehri
 1: Marwan Al-Shehhi, Mohammed Haydar Zammar
 1: Marwan Al-Shehhi, Mohammed Atta
 1: Marwan Al-Shehhi, Majed Moqed
 1: Marwan Al-Shehhi, Hani Hanjour
 1: Marwan Al-Shehhi, Hamza Alghamdi
 1: Marwan Al-Shehhi, Ahmed Ibrahim A. Al Haznawi
 1: Marwan Al-Shehhi, Ahmed Alnami
 1: Marwan Al-Shehhi, Ahmed Alghamdi
 1: Marwan Al-Shehhi, Abdulaziz Alomari
 1: Majed Moqed, Zacarias Moussaoui
 1: Majed Moqed, Mohammed Haydar Zammar
 1: Hani Hanjour, Ziad Samir Jarrah

1: Hani Hanjour, Zacarias Moussaoui
 1: Hani Hanjour, Mohammed Haydar Zammar
 1: Hani Hanjour, Majed Moqed
 1: Hamza Alghamdi, Ziad Samir Jarrah
 1: Hamza Alghamdi, Zacarias Moussaoui
 1: Hamza Alghamdi, Waleed M. Alshehri
 1: Hamza Alghamdi, Wail M. Alshehri
 1: Hamza Alghamdi, Salem Alhazmi
 1: Hamza Alghamdi, Saeed Alghamdi
 1: Hamza Alghamdi, Nawaf Alhazmi
 1: Hamza Alghamdi, Mohand Alshehri
 1: Hamza Alghamdi, Mohammed Haydar Zammar
 1: Hamza Alghamdi, Mohammed Atta
 1: Hamza Alghamdi, Majed Moqed
 1: Hamza Alghamdi, Hani Hanjour
 1: Hamza Alghamdi, Ahmed Alnami
 1: Hamza Alghamdi, Abdulaziz Alomari
 1: Fazul Abdullah Mohammed, Sheikh Ahmed Salim Swedan
 1: Fazul Abdullah Mohammed, Fahid Mohammed Ally Msalam
 1: Fathur Rohman al-Ghozi, Yunus Moklis
 1: Fathur Rohman al-Ghozi, Ustadz Nur Mohammed Umog
 1: Fathur Rohman al-Ghozi, Faiz Abu Bakar Bafana
 1: Faiz Abu Bakar Bafana, Yunus Moklis
 1: Faiz Abu Bakar Bafana, Ustadz Nur Mohammed Umog
 1: Fahid Mohammed Ally Msalam, Sheikh Ahmed Salim Swedan
 1: Christian Manfred G., Nizar Ben Mohammed Nawar
 1: Christian Manfred G., Mouhamedou Ould Slehi
 1: Anas al-Liby, Sheikh Ahmed Salim Swedan
 1: Anas al-Liby, Peter Kinyanjui
 1: Anas al-Liby, Mustafa Mohamed Fadhil
 1: Anas al-Liby, Muhsin Musa Matwalli Atwah
 1: Anas al-Liby, Fazul Abdullah Mohammed
 1: Anas al-Liby, Fahid Mohammed Ally Msalam
 1: Anas al-Liby, Ahmed Mohammed Hamed Ali
 1: Anas al-Liby, Ahmed Khalfan Ghailani
 1: Anas al-Liby, Ahmed Ibrahim
 1: Ahmed Omar Abdel Rahman, Abdul Rahman Yasin
 1: Ahmed Mohammed Hamed Ali, Sheikh Ahmed Salim Swedan
 1: Ahmed Mohammed Hamed Ali, Peter Kinyanjui
 1: Ahmed Mohammed Hamed Ali, Fazul Abdullah Mohammed
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 1: Ahmed Khalfan Ghailani, Sheikh Ahmed Salim Swedan
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 1: Ahmed Khalfan Ghailani, Fazul Abdullah Mohammed
 1: Ahmed Khalfan Ghailani, Fahid Mohammed Ally Msalam
 1: Ahmed Khalfan Ghailani, Ahmed Mohammed Hamed Ali
 1: Ahmed Ibrahim A. Al Haznawi, Ziad Samir Jarrah
 1: Ahmed Ibrahim A. Al Haznawi, Zacarias Moussaoui
 1: Ahmed Ibrahim A. Al Haznawi, Waleed M. Alshehri
 1: Ahmed Ibrahim A. Al Haznawi, Wail M. Alshehri
 1: Ahmed Ibrahim A. Al Haznawi, Satam M.A. Al Suqami
 1: Ahmed Ibrahim A. Al Haznawi, Salem Alhazmi

1: Ahmed Ibrahim A. Al Haznawi, Saeed Alghamdi
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 1: Ahmed Ibrahim A. Al Haznawi, Mohand Alshehri
 1: Ahmed Ibrahim A. Al Haznawi, Mohammed Haydar Zammar
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 1: Ahmed Ibrahim A. Al Haznawi, Ahmed Mohammed Hamed Ali
 1: Ahmed Ibrahim A. Al Haznawi, Ahmed Khalfan Ghailani

1: Abdullah Ahmed Abdullah, Ahmed Brahim
 1: Abdulaziz Alomari, Ziad Samir Jarrah
 1: Abdulaziz Alomari, Zacarias Moussaoui
 1: Abdulaziz Alomari, Waleed M. Alshehri
 1: Abdulaziz Alomari, Wail M. Alshehri
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 1: Abdulaziz Alomari, Mohammed Atta
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 1: Abdulaziz Alomari, Hani Hanjour
 0.8: Ayman Mohammed Rabie al-Zawahiri, Muhammad Atef
 0.75: Satam M.A. Al Suqami, Khalid Almihdhar
 0.75: Salem Alhazmi, Khalid Almihdhar
 0.75: Saeed Alghamdi, Khalid Almihdhar
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 0.67: Anas al-Liby, Khalid al-Shanqiti
 0.67: Abdullah Ahmed Abdullah, Osama Bin Laden

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 0.5: Mustafa Mohamed Fadhil, Khalid al Fawwaz
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 0.5: Muhammad Atef, Sheikh Ahmed Salim Swedan
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 0.4: Satam M.A. Al Suqami, Peter Kinyanjui
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0.4: Mohand Alshehri, Ahmed Khalfan Ghailani
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 0.4: Anas al-Liby, Ahmed Alghamdi
 0.4: Anas al-Liby, Abdulaziz Alomari
 0.4: Ahmed Mohammed Hamed Ali, Ziad Samir Jarrah
 0.4: Ahmed Mohammed Hamed Ali, Zacarias Moussaoui
 0.4: Ahmed Mohammed Hamed Ali, Mohammed Haydar Zammar
 0.4: Ahmed Mohammed Hamed Ali, Majed Moqed
 0.4: Ahmed Mohammed Hamed Ali, Hani Hanjour
 0.4: Ahmed Khalfan Ghailani, Ziad Samir Jarrah
 0.4: Ahmed Khalfan Ghailani, Zacarias Moussaoui
 0.4: Ahmed Khalfan Ghailani, Mohammed Haydar Zammar
 0.4: Ahmed Khalfan Ghailani, Majed Moqed
 0.4: Ahmed Khalfan Ghailani, Hani Hanjour
 0.4: Ahmed Ibrahim A. Al Haznawi, Sheikh Ahmed Salim Swedan
 0.4: Ahmed Ibrahim A. Al Haznawi, Peter Kinyanjui
 0.4: Ahmed Ibrahim A. Al Haznawi, Osama Bin Laden
 0.4: Ahmed Ibrahim A. Al Haznawi, Mustafa Mohamed Fadhil
 0.4: Ahmed Ibrahim A. Al Haznawi, Muhsin Musa Matwalli Atwah
 0.4: Ahmed Ibrahim A. Al Haznawi, Muhammad Atef
 0.4: Ahmed Ibrahim A. Al Haznawi, Khalid al Fawwaz
 0.4: Ahmed Ibrahim A. Al Haznawi, Fazul Abdullah Mohammed
 0.4: Ahmed Ibrahim A. Al Haznawi, Fahid Mohammed Ally Msalam
 0.4: Ahmed Ibrahim A. Al Haznawi, Ahmed Mohammed Hamed Ali
 0.4: Ahmed Ibrahim A. Al Haznawi, Ahmed Khalfan Ghailani
 0.4: Ahmed Ibrahim A. Al Haznawi, Ahmed Brahim
 0.4: Ahmed Brahim, Ziad Samir Jarrah
 0.4: Ahmed Brahim, Zacarias Moussaoui
 0.4: Ahmed Brahim, Mohammed Haydar Zammar
 0.4: Ahmed Brahim, Majed Moqed
 0.4: Ahmed Brahim, Hani Hanjour
 0.4: Ahmed Alnami, Sheikh Ahmed Salim Swedan
 0.4: Ahmed Alnami, Peter Kinyanjui
 0.4: Ahmed Alnami, Osama Bin Laden
 0.4: Ahmed Alnami, Mustafa Mohamed Fadhil
 0.4: Ahmed Alnami, Muhsin Musa Matwalli Atwah

0.4: Ahmed Alnami, Muhammad Atef
 0.4: Ahmed Alnami, Khalid al Fawwaz
 0.4: Ahmed Alnami, Fazul Abdullah Mohammed
 0.4: Ahmed Alnami, Fahid Mohammed Ally Msalam
 0.4: Ahmed Alnami, Ahmed Mohammed Hamed Ali
 0.4: Ahmed Alnami, Ahmed Khalfan Ghailani
 0.4: Ahmed Alnami, Ahmed Brahim
 0.4: Ahmed Alghamdi, Sheikh Ahmed Salim Swedan
 0.4: Ahmed Alghamdi, Peter Kinyanjui
 0.4: Ahmed Alghamdi, Osama Bin Laden
 0.4: Ahmed Alghamdi, Mustafa Mohamed Fadhil
 0.4: Ahmed Alghamdi, Muhsin Musa Matwalli Atwah
 0.4: Ahmed Alghamdi, Muhammad Atef
 0.4: Ahmed Alghamdi, Khalid al Fawwaz
 0.4: Ahmed Alghamdi, Fazul Abdullah Mohammed
 0.4: Ahmed Alghamdi, Fahid Mohammed Ally Msalam
 0.4: Ahmed Alghamdi, Ahmed Mohammed Hamed Ali
 0.4: Ahmed Alghamdi, Ahmed Khalfan Ghailani
 0.4: Ahmed Alghamdi, Ahmed Brahim
 0.4: Abdullah Ahmed Abdullah, Ziad Samir Jarrah
 0.4: Abdullah Ahmed Abdullah, Zacarias Moussaoui
 0.4: Abdullah Ahmed Abdullah, Waleed M. Alshehri
 0.4: Abdullah Ahmed Abdullah, Wail M. Alshehri
 0.4: Abdullah Ahmed Abdullah, Satam M.A. Al Suqami
 0.4: Abdullah Ahmed Abdullah, Salem Alhazmi
 0.4: Abdullah Ahmed Abdullah, Saeed Alghamdi
 0.4: Abdullah Ahmed Abdullah, Nawaf Alhazmi
 0.4: Abdullah Ahmed Abdullah, Mohand Alshehri
 0.4: Abdullah Ahmed Abdullah, Mohammed Haydar Zammar
 0.4: Abdullah Ahmed Abdullah, Mohammed Atta
 0.4: Abdullah Ahmed Abdullah, Marwan Al-Shehhi
 0.4: Abdullah Ahmed Abdullah, Majed Moqed
 0.4: Abdullah Ahmed Abdullah, Khalid Almihdhar
 0.4: Abdullah Ahmed Abdullah, Hani Hanjour
 0.4: Abdullah Ahmed Abdullah, Hamza Alghamdi
 0.4: Abdullah Ahmed Abdullah, Ahmed Ibrahim A. Al Haznawi
 0.4: Abdullah Ahmed Abdullah, Ahmed Alnami
 0.4: Abdullah Ahmed Abdullah, Ahmed Alghamdi
 0.4: Abdullah Ahmed Abdullah, Abdulaziz Alomari
 0.4: Abdulaziz Alomari, Sheikh Ahmed Salim Swedan
 0.4: Abdulaziz Alomari, Peter Kinyanjui
 0.4: Abdulaziz Alomari, Osama Bin Laden
 0.4: Abdulaziz Alomari, Mustafa Mohamed Fadhil
 0.4: Abdulaziz Alomari, Muhsin Musa Matwalli Atwah
 0.4: Abdulaziz Alomari, Muhammad Atef
 0.4: Abdulaziz Alomari, Khalid al Fawwaz
 0.4: Abdulaziz Alomari, Fazul Abdullah Mohammed
 0.4: Abdulaziz Alomari, Fahid Mohammed Ally Msalam
 0.4: Abdulaziz Alomari, Ahmed Mohammed Hamed Ali
 0.4: Abdulaziz Alomari, Ahmed Khalfan Ghailani
 0.4: Abdulaziz Alomari, Ahmed Brahim
 0.33: Ziad Samir Jarrah, Nizar Ben Mohammed Nawar

0.33: Ziad Samir Jarrah, Mouhamedou Ould Slehi
0.33: Ziad Samir Jarrah, Christian Manfred G.
0.33: Zacarias Moussaoui, Nizar Ben Mohammed Nawar
0.33: Zacarias Moussaoui, Mouhamedou Ould Slehi
0.33: Waleed M. Alshehri, Raed Hijazi
0.33: Waleed M. Alshehri, Nizar Ben Mohammed Nawar
0.33: Waleed M. Alshehri, Mouhamedou Ould Slehi
0.33: Waleed M. Alshehri, Christian Manfred G.
0.33: Wail M. Alshehri, Raed Hijazi
0.33: Wail M. Alshehri, Nizar Ben Mohammed Nawar
0.33: Wail M. Alshehri, Mouhamedou Ould Slehi
0.33: Wail M. Alshehri, Christian Manfred G.
0.33: Satam M.A. Al Suqami, Raed Hijazi
0.33: Satam M.A. Al Suqami, Nizar Ben Mohammed Nawar
0.33: Satam M.A. Al Suqami, Mouhamedou Ould Slehi
0.33: Satam M.A. Al Suqami, Christian Manfred G.
0.33: Salem Alhazmi, Raed Hijazi
0.33: Salem Alhazmi, Nizar Ben Mohammed Nawar
0.33: Salem Alhazmi, Mouhamedou Ould Slehi
0.33: Salem Alhazmi, Christian Manfred G.
0.33: Saeed Alghamdi, Raed Hijazi
0.33: Saeed Alghamdi, Nizar Ben Mohammed Nawar
0.33: Saeed Alghamdi, Mouhamedou Ould Slehi
0.33: Saeed Alghamdi, Christian Manfred G.
0.33: Raed Hijazi, Ziad Samir Jarrah
0.33: Raed Hijazi, Zacarias Moussaoui
0.33: Raed Hijazi, Sheikh Ahmed Salim Swedan
0.33: Raed Hijazi, Peter Kinyanjui
0.33: Raed Hijazi, Nizar Ben Mohammed Nawar
0.33: Raed Hijazi, Mouhamedou Ould Slehi
0.33: Raed Hijazi, Mohammed Haydar Zammar
0.33: Raed Hijazi, Majed Moqed
0.33: Raed Hijazi, Fazul Abdullah Mohammed
0.33: Raed Hijazi, Fahid Mohammed Ally Msalam
0.33: Raed Hijazi, Christian Manfred G.
0.33: Peter Kinyanjui, Nizar Ben Mohammed Nawar
0.33: Peter Kinyanjui, Mouhamedou Ould Slehi
0.33: Peter Kinyanjui, Christian Manfred G.
0.33: Osama Bin Laden, Raed Hijazi
0.33: Osama Bin Laden, Nizar Ben Mohammed Nawar
0.33: Osama Bin Laden, Mouhamedou Ould Slehi
0.33: Osama Bin Laden, Christian Manfred G.
0.33: Nizar Ben Mohammed Nawar, Sheikh Ahmed Salim Swedan
0.33: Nizar Ben Mohammed Nawar, Mohammed Haydar Zammar
0.33: Nawaf Alhazmi, Raed Hijazi
0.33: Nawaf Alhazmi, Nizar Ben Mohammed Nawar
0.33: Nawaf Alhazmi, Mouhamedou Ould Slehi
0.33: Nawaf Alhazmi, Christian Manfred G.
0.33: Mustafa Mohamed Fadhil, Raed Hijazi
0.33: Mustafa Mohamed Fadhil, Nizar Ben Mohammed Nawar
0.33: Mustafa Mohamed Fadhil, Mouhamedou Ould Slehi
0.33: Mustafa Mohamed Fadhil, Christian Manfred G.

0.33: Muhsin Musa Matwalli Atwah, Raed Hijazi
0.33: Muhsin Musa Matwalli Atwah, Nizar Ben Mohammed Nawar
0.33: Muhsin Musa Matwalli Atwah, Mouhamedou Ould Slehi
0.33: Muhsin Musa Matwalli Atwah, Christian Manfred G.
0.33: Muhammad Atef, Raed Hijazi
0.33: Muhammad Atef, Nizar Ben Mohammed Nawar
0.33: Muhammad Atef, Mouhamedou Ould Slehi
0.33: Muhammad Atef, Christian Manfred G.
0.33: Mouhamedou Ould Slehi, Sheikh Ahmed Salim Swedan
0.33: Mouhamedou Ould Slehi, Mohammed Haydar Zammar
0.33: Mohand Alshehri, Raed Hijazi
0.33: Mohand Alshehri, Nizar Ben Mohammed Nawar
0.33: Mohand Alshehri, Mouhamedou Ould Slehi
0.33: Mohand Alshehri, Christian Manfred G.
0.33: Mohammed Atta, Raed Hijazi
0.33: Mohammed Atta, Nizar Ben Mohammed Nawar
0.33: Mohammed Atta, Mouhamedou Ould Slehi
0.33: Mohammed Atta, Christian Manfred G.
0.33: Marwan Al-Shehhi, Raed Hijazi
0.33: Marwan Al-Shehhi, Nizar Ben Mohammed Nawar
0.33: Marwan Al-Shehhi, Mouhamedou Ould Slehi
0.33: Marwan Al-Shehhi, Christian Manfred G.
0.33: Majed Moqed, Nizar Ben Mohammed Nawar
0.33: Majed Moqed, Mouhamedou Ould Slehi
0.33: Khalid al-Shanqiti, Raed Hijazi
0.33: Khalid al-Shanqiti, Nizar Ben Mohammed Nawar
0.33: Khalid al-Shanqiti, Mouhamedou Ould Slehi
0.33: Khalid al-Shanqiti, Christian Manfred G.
0.33: Khalid Almihdhar, Raed Hijazi
0.33: Khalid Almihdhar, Nizar Ben Mohammed Nawar
0.33: Khalid Almihdhar, Mouhamedou Ould Slehi
0.33: Khalid Almihdhar, Christian Manfred G.
0.33: Khalid al Fawwaz, Raed Hijazi
0.33: Khalid al Fawwaz, Nizar Ben Mohammed Nawar
0.33: Khalid al Fawwaz, Mouhamedou Ould Slehi
0.33: Khalid al Fawwaz, Christian Manfred G.
0.33: Hani Hanjour, Raed Hijazi
0.33: Hani Hanjour, Nizar Ben Mohammed Nawar
0.33: Hani Hanjour, Mouhamedou Ould Slehi
0.33: Hani Hanjour, Christian Manfred G.
0.33: Hamza Alghamdi, Raed Hijazi
0.33: Hamza Alghamdi, Nizar Ben Mohammed Nawar
0.33: Hamza Alghamdi, Mouhamedou Ould Slehi
0.33: Hamza Alghamdi, Christian Manfred G.
0.33: Fazul Abdullah Mohammed, Nizar Ben Mohammed Nawar
0.33: Fazul Abdullah Mohammed, Mouhamedou Ould Slehi
0.33: Fahid Mohammed Ally Msalam, Nizar Ben Mohammed Nawar
0.33: Fahid Mohammed Ally Msalam, Mouhamedou Ould Slehi
0.33: Christian Manfred G., Zacarias Moussaoui
0.33: Christian Manfred G., Sheikh Ahmed Salim Swedan
0.33: Christian Manfred G., Mohammed Haydar Zammar
0.33: Christian Manfred G., Majed Moqed

A16. Pairs of group names with transitive closure of GPP ≥ 3

Percentage of Total: 0.5690 %

Number of Pairs: 4

- 1: Jaish-i-Mohammad, Harkat-ul Mujahideen (HUM)
- 1: Islamic Front for Jihad Against Jews and Crusaders, Hizb-ut-Tahrir
- 1: Islamic Front for Jihad Against Jews and Crusaders, al-Muhajiroun
- 1: al-Muhajiroun, Hizb-ut-Tahrir

A17. Pairs of people names with PGP ≥ 3

Percentage of Total: 68.6273 %

Number of Pairs: 21877

Not shown. Available upon request.

A18. Pairs of people names with transitive closure of PGP ≥ 3

Percentage of Total: 89.9743 %

Number of Pairs: 28682

Not shown. Available upon request.

A18. Pairs of people names with PRP ≥ 3

Percentage of Total: 7.4667 %

Number of Pairs: 588

- 1: Sheikh Mir Hamza, Shaikh Saiid
- 1: Sheikh Mir Hamza, Peter Kinyanjui
- 1: Sheikh Mir Hamza, Nizar Trabelsi
- 1: Sheikh Mir Hamza, Mohammed Saddiq Odeh
- 1: Sheikh Mir Hamza, Mohammed Jamal Khalifa
- 1: Sheikh Mir Hamza, Mohamed Rashed Daoud Owhali
- 1: Sheikh Mir Hamza, Mamdouh Mahmud Salim
- 1: Sheikh Mir Hamza, Majid Shimari
- 1: Sheikh Mir Hamza, Latif Mansour
- 1: Sheikh Mir Hamza, Khalfan Khamis Mohamed
- 1: Sheikh Mir Hamza, John Walker Lindh
- 1: Sheikh Mir Hamza, Abu Abdullah Shafae
- 1: Shaikh Saiid, Nizar Trabelsi
- 1: Shaikh Saiid, Mamdouh Mahmud Salim
- 1: Shaikh Saiid, Majid Shimari
- 1: Shaikh Saiid, Abu Abdullah Shafae
- 1: Peter Kinyanjui, Shaikh Saiid
- 1: Peter Kinyanjui, Nizar Trabelsi
- 1: Peter Kinyanjui, Mohammed Saddiq Odeh
- 1: Peter Kinyanjui, Mohamed Rashed Daoud Owhali
- 1: Peter Kinyanjui, Mamdouh Mahmud Salim

1: Peter Kinyanjui, Majid Shimari
 1: Peter Kinyanjui, Latif Mansour
 1: Peter Kinyanjui, Khalfan Khamis Mohamed
 1: Peter Kinyanjui, John Walker Lindh
 1: Peter Kinyanjui, Abu Abdullah Shafae
 1: Omar Ibn al Khattab, Sheikh Mir Hamza
 1: Omar Ibn al Khattab, Shaihk Saiid
 1: Omar Ibn al Khattab, Peter Kinyanjui
 1: Omar Ibn al Khattab, Nizar Trabelsi
 1: Omar Ibn al Khattab, Mohammed Saddiq Odeh
 1: Omar Ibn al Khattab, Mohammed Jamal Khalifa
 1: Omar Ibn al Khattab, Mohamed Rashed Daoud Owhali
 1: Omar Ibn al Khattab, Mamdouh Mahmud Salim
 1: Omar Ibn al Khattab, Majid Shimari
 1: Omar Ibn al Khattab, Latif Mansour
 1: Omar Ibn al Khattab, Khalid al Fawwaz
 1: Omar Ibn al Khattab, Khalfan Khamis Mohamed
 1: Omar Ibn al Khattab, Kamel Daoudi
 1: Omar Ibn al Khattab, John Walker Lindh
 1: Omar Ibn al Khattab, Jean-Marc Granvisir
 1: Omar Ibn al Khattab, Abu Abdullah Shafae
 1: Omar al-Faruq, Abu Zubair al Haili
 1: Mubarak al-Duri, Sheikh Mir Hamza
 1: Mubarak al-Duri, Shaihk Saiid
 1: Mubarak al-Duri, Peter Kinyanjui
 1: Mubarak al-Duri, Omar Ibn al Khattab
 1: Mubarak al-Duri, Nizar Trabelsi
 1: Mubarak al-Duri, Mohammed Saddiq Odeh
 1: Mubarak al-Duri, Mohammed Jamal Khalifa
 1: Mubarak al-Duri, Mohamed Rashed Daoud Owhali
 1: Mubarak al-Duri, Mamdouh Mahmud Salim
 1: Mubarak al-Duri, Majid Shimari
 1: Mubarak al-Duri, Latif Mansour
 1: Mubarak al-Duri, Khalid al Fawwaz
 1: Mubarak al-Duri, Khalfan Khamis Mohamed
 1: Mubarak al-Duri, Kamel Daoudi
 1: Mubarak al-Duri, John Walker Lindh
 1: Mubarak al-Duri, Jean-Marc Granvisir
 1: Mubarak al-Duri, Ahmad Al-Gamen
 1: Mubarak al-Duri, Abu Abdullah Shafae
 1: Mohammed Saddiq Odeh, Shaihk Saiid
 1: Mohammed Saddiq Odeh, Nizar Trabelsi
 1: Mohammed Saddiq Odeh, Mohamed Rashed Daoud Owhali
 1: Mohammed Saddiq Odeh, Mamdouh Mahmud Salim
 1: Mohammed Saddiq Odeh, Majid Shimari
 1: Mohammed Saddiq Odeh, Abu Abdullah Shafae
 1: Mohammed Jamal Khalifa, Shaihk Saiid
 1: Mohammed Jamal Khalifa, Peter Kinyanjui
 1: Mohammed Jamal Khalifa, Nizar Trabelsi
 1: Mohammed Jamal Khalifa, Mohammed Saddiq Odeh
 1: Mohammed Jamal Khalifa, Mohamed Rashed Daoud Owhali
 1: Mohammed Jamal Khalifa, Mamdouh Mahmud Salim

1: Mohammed Jamal Khalifa, Majid Shimari
 1: Mohammed Jamal Khalifa, Latif Mansour
 1: Mohammed Jamal Khalifa, Khalfan Khamis Mohamed
 1: Mohammed Jamal Khalifa, John Walker Lindh
 1: Mohammed Jamal Khalifa, Abu Abdullah Shafae
 1: Mohamed Rashed Daoud Owhali, Shaikh Saiid
 1: Mohamed Rashed Daoud Owhali, Nizar Trabelsi
 1: Mohamed Rashed Daoud Owhali, Mamdouh Mahmud Salim
 1: Mohamed Rashed Daoud Owhali, Majid Shimari
 1: Mohamed Rashed Daoud Owhali, Abu Abdullah Shafae
 1: Mamdouh Mahmud Salim, Nizar Trabelsi
 1: Mamdouh Mahmud Salim, Majid Shimari
 1: Mamdouh Mahmud Salim, Abu Abdullah Shafae
 1: Majid Shimari, Nizar Trabelsi
 1: Latif Mansour, Shaikh Saiid
 1: Latif Mansour, Nizar Trabelsi
 1: Latif Mansour, Mohammed Saddiq Odeh
 1: Latif Mansour, Mohamed Rashed Daoud Owhali
 1: Latif Mansour, Mamdouh Mahmud Salim
 1: Latif Mansour, Majid Shimari
 1: Latif Mansour, Khalfan Khamis Mohamed
 1: Latif Mansour, Abu Abdullah Shafae
 1: Khalid Shaikh Mohammed, Abdul Rahman Yasin
 1: Khalid Shaikh Mohammed, Abdul Hakim Murad
 1: Khalid al Fawwaz, Sheikh Mir Hamza
 1: Khalid al Fawwaz, Shaikh Saiid
 1: Khalid al Fawwaz, Peter Kinyanjui
 1: Khalid al Fawwaz, Nizar Trabelsi
 1: Khalid al Fawwaz, Mohammed Saddiq Odeh
 1: Khalid al Fawwaz, Mohammed Jamal Khalifa
 1: Khalid al Fawwaz, Mohamed Rashed Daoud Owhali
 1: Khalid al Fawwaz, Mamdouh Mahmud Salim
 1: Khalid al Fawwaz, Majid Shimari
 1: Khalid al Fawwaz, Latif Mansour
 1: Khalid al Fawwaz, Khalfan Khamis Mohamed
 1: Khalid al Fawwaz, John Walker Lindh
 1: Khalid al Fawwaz, Jean-Marc Granvisir
 1: Khalid al Fawwaz, Abu Abdullah Shafae
 1: Khalfan Khamis Mohamed, Shaikh Saiid
 1: Khalfan Khamis Mohamed, Nizar Trabelsi
 1: Khalfan Khamis Mohamed, Mohammed Saddiq Odeh
 1: Khalfan Khamis Mohamed, Mohamed Rashed Daoud Owhali
 1: Khalfan Khamis Mohamed, Mamdouh Mahmud Salim
 1: Khalfan Khamis Mohamed, Majid Shimari
 1: Khalfan Khamis Mohamed, Abu Abdullah Shafae
 1: Kamel Daoudi, Sheikh Mir Hamza
 1: Kamel Daoudi, Shaikh Saiid
 1: Kamel Daoudi, Peter Kinyanjui
 1: Kamel Daoudi, Nizar Trabelsi
 1: Kamel Daoudi, Mohammed Saddiq Odeh
 1: Kamel Daoudi, Mohammed Jamal Khalifa
 1: Kamel Daoudi, Mohamed Rashed Daoud Owhali

1: Kamel Daoudi, Mamdouh Mahmud Salim
 1: Kamel Daoudi, Majid Shimari
 1: Kamel Daoudi, Latif Mansour
 1: Kamel Daoudi, Khalid al Fawwaz
 1: Kamel Daoudi, Khalfan Khamis Mohamed
 1: Kamel Daoudi, John Walker Lindh
 1: Kamel Daoudi, Jean-Marc Granvisir
 1: Kamel Daoudi, Abu Abdullah Shafae
 1: John Walker Lindh, Shaikh Saiid
 1: John Walker Lindh, Nizar Trabelsi
 1: John Walker Lindh, Mohammed Saddiq Odeh
 1: John Walker Lindh, Mohamed Rashed Daoud Owhali
 1: John Walker Lindh, Mamdouh Mahmud Salim
 1: John Walker Lindh, Majid Shimari
 1: John Walker Lindh, Latif Mansour
 1: John Walker Lindh, Khalfan Khamis Mohamed
 1: John Walker Lindh, Abu Abdullah Shafae
 1: Jean-Marc Granvisir, Sheikh Mir Hamza
 1: Jean-Marc Granvisir, Shaikh Saiid
 1: Jean-Marc Granvisir, Peter Kinyanjui
 1: Jean-Marc Granvisir, Nizar Trabelsi
 1: Jean-Marc Granvisir, Mohammed Saddiq Odeh
 1: Jean-Marc Granvisir, Mohammed Jamal Khalifa
 1: Jean-Marc Granvisir, Mohamed Rashed Daoud Owhali
 1: Jean-Marc Granvisir, Mamdouh Mahmud Salim
 1: Jean-Marc Granvisir, Majid Shimari
 1: Jean-Marc Granvisir, Latif Mansour
 1: Jean-Marc Granvisir, Khalfan Khamis Mohamed
 1: Jean-Marc Granvisir, John Walker Lindh
 1: Jean-Marc Granvisir, Abu Abdullah Shafae
 1: Imad Eddin Barakat, Nabil Sayadi
 1: Ahmad Al-Gamen, Sheikh Mir Hamza
 1: Ahmad Al-Gamen, Shaikh Saiid
 1: Ahmad Al-Gamen, Peter Kinyanjui
 1: Ahmad Al-Gamen, Omar Ibn al Khattab
 1: Ahmad Al-Gamen, Nizar Trabelsi
 1: Ahmad Al-Gamen, Mohammed Saddiq Odeh
 1: Ahmad Al-Gamen, Mohammed Jamal Khalifa
 1: Ahmad Al-Gamen, Mohamed Rashed Daoud Owhali
 1: Ahmad Al-Gamen, Mamdouh Mahmud Salim
 1: Ahmad Al-Gamen, Majid Shimari
 1: Ahmad Al-Gamen, Latif Mansour
 1: Ahmad Al-Gamen, Khalid al Fawwaz
 1: Ahmad Al-Gamen, Khalfan Khamis Mohamed
 1: Ahmad Al-Gamen, Kamel Daoudi
 1: Ahmad Al-Gamen, John Walker Lindh
 1: Ahmad Al-Gamen, Jean-Marc Granvisir
 1: Ahmad Al-Gamen, Abu Abdullah Shafae
 1: Abu Abdullah Shafae, Nizar Trabelsi
 1: Abu Abdullah Shafae, Majid Shimari
 1: Abdul Hakim Murad, Abdul Rahman Yasin
 1: Abdalrahman Alarnaot Abu-Aljer, Mohamed Setmariam Nasar

0.8: Wail M. Alshehri, Waleed M. Alshehri
 0.8: Wail M. Alshehri, Mohand Alshehri
 0.8: Satam M.A. Al Suqami, Waleed M. Alshehri
 0.8: Satam M.A. Al Suqami, Wail M. Alshehri
 0.8: Satam M.A. Al Suqami, Mohand Alshehri
 0.8: Satam M.A. Al Suqami, Hamza Alghamdi
 0.8: Satam M.A. Al Suqami, Ahmed Alghamdi
 0.8: Satam M.A. Al Suqami, Abdulaziz Alomari
 0.8: Salem Alhazmi, Majed Moqed
 0.8: Salem Alhazmi, Hani Hanjour
 0.8: Saeed Alghamdi, Ahmed Alnami
 0.8: Nawaf Alhazmi, Salem Alhazmi
 0.8: Nawaf Alhazmi, Majed Moqed
 0.8: Nawaf Alhazmi, Hani Hanjour
 0.8: Mohand Alshehri, Waleed M. Alshehri
 0.8: Marwan Al-Shehhi, Waleed M. Alshehri
 0.8: Marwan Al-Shehhi, Wail M. Alshehri
 0.8: Marwan Al-Shehhi, Satam M.A. Al Suqami
 0.8: Marwan Al-Shehhi, Mohand Alshehri
 0.8: Marwan Al-Shehhi, Hamza Alghamdi
 0.8: Marwan Al-Shehhi, Ahmed Alghamdi
 0.8: Marwan Al-Shehhi, Abdulaziz Alomari
 0.8: Hani Hanjour, Majed Moqed
 0.8: Hamza Alghamdi, Waleed M. Alshehri
 0.8: Hamza Alghamdi, Wail M. Alshehri
 0.8: Hamza Alghamdi, Mohand Alshehri
 0.8: Hamza Alghamdi, Abdulaziz Alomari
 0.8: Ahmed Ibrahim A. Al Haznawi, Saeed Alghamdi
 0.8: Ahmed Ibrahim A. Al Haznawi, Ahmed Alnami
 0.8: Ahmed Alghamdi, Waleed M. Alshehri
 0.8: Ahmed Alghamdi, Wail M. Alshehri
 0.8: Ahmed Alghamdi, Mohand Alshehri
 0.8: Ahmed Alghamdi, Hamza Alghamdi
 0.8: Ahmed Alghamdi, Abdulaziz Alomari
 0.8: Abdullah Ahmed Abdullah, Saif Al-Adel
 0.8: Abdulaziz Alomari, Waleed M. Alshehri
 0.8: Abdulaziz Alomari, Wail M. Alshehri
 0.8: Abdulaziz Alomari, Mohand Alshehri
 0.67: Sulaiman Abu Ghaith, Imad Mugniyah
 0.67: Abdul Hai Mutmaen, Mohammad Omar
 0.64: Ziad Samir Jarrah, Zacarias Moussaoui
 0.64: Waleed M. Alshehri, Mohammed Atta
 0.64: Wail M. Alshehri, Mohammed Atta
 0.64: Satam M.A. Al Suqami, Mohammed Atta
 0.64: Mohand Alshehri, Mohammed Atta
 0.64: Marwan Al-Shehhi, Mohammed Atta
 0.64: Hamza Alghamdi, Mohammed Atta
 0.64: Ahmed Alghamdi, Mohammed Atta
 0.64: Abdulaziz Alomari, Mohammed Atta
 0.6: Zayn-al-Abidin Abu-Zubaydah, Ayman Mohammed Rabie al-Zawahiri
 0.6: Yacine Aknouche, Djamel Beghal
 0.6: Anas al-Liby, Ayman Mohammed Rabie al-Zawahiri

0.56: Zayn-al-Abidin Abu-Zubaydah, Anas al-Liby
 0.5: Wakil Ahmed Muttawakil, Abdul Salam Zaeef
 0.5: Tarek Chaarabi, Lased Ben Henin
 0.5: Sheikh Mir Hamza, Rafiq Islam
 0.5: Sheikh Mir Hamza, Mohammad Omar
 0.5: Sheikh Mir Hamza, Imad Mugniyah
 0.5: Sheikh Mir Hamza, Eri Ziyad Abu Zaki
 0.5: Sheikh Mir Hamza, Ahmed Omar Abdel Rahman
 0.5: Sheikh Mir Hamza, Abu Malik
 0.5: Shaikh Saiid, Eri Ziyad Abu Zaki
 0.5: Salim Boukhari, Lamine Maroni
 0.5: Salim Boukhari, Fouhad Sabour
 0.5: Saif Al-Adel, Imad Mugniyah
 0.5: Saeed Alghamdi, Ziad Samir Jarrah
 0.5: Saeed Alghamdi, Zacarias Moussaoui
 0.5: Sa'd Usama bin Laden, Sheikh Mir Hamza
 0.5: Sa'd Usama bin Laden, Shaikh Saiid
 0.5: Sa'd Usama bin Laden, Peter Kinyanjui
 0.5: Sa'd Usama bin Laden, Nizar Trabelsi
 0.5: Sa'd Usama bin Laden, Mohammed Saddiq Odeh
 0.5: Sa'd Usama bin Laden, Mohammed Jamal Khalifa
 0.5: Sa'd Usama bin Laden, Mohamed Rashed Daoud Owhali
 0.5: Sa'd Usama bin Laden, Mamdouh Mahmud Salim
 0.5: Sa'd Usama bin Laden, Majid Shimari
 0.5: Sa'd Usama bin Laden, Latif Mansour
 0.5: Sa'd Usama bin Laden, Khalid al Fawwaz
 0.5: Sa'd Usama bin Laden, Khalfan Khamis Mohamed
 0.5: Sa'd Usama bin Laden, Kamel Daoudi
 0.5: Sa'd Usama bin Laden, John Walker Lindh
 0.5: Sa'd Usama bin Laden, Jean-Marc Granvisir
 0.5: Sa'd Usama bin Laden, Abu Abdullah Shafae
 0.5: Ruhai Ahmed, Shafiq Rasul
 0.5: Ruhai Ahmed, Munir Ali
 0.5: Ruhai Ahmed, Asif Iqbal
 0.5: Riduan Isamuddin, Khalid Shaikh Mohammed
 0.5: Riduan Isamuddin, Abdul Rahman Yasin
 0.5: Riduan Isamuddin, Abdul Hakim Murad
 0.5: Rafiq Islam, Shaikh Saiid
 0.5: Rafiq Islam, Peter Kinyanjui
 0.5: Rafiq Islam, Nizar Trabelsi
 0.5: Rafiq Islam, Mohammed Saddiq Odeh
 0.5: Rafiq Islam, Mohammed Jamal Khalifa
 0.5: Rafiq Islam, Mohamed Rashed Daoud Owhali
 0.5: Rafiq Islam, Mamdouh Mahmud Salim
 0.5: Rafiq Islam, Majid Shimari
 0.5: Rafiq Islam, Latif Mansour
 0.5: Rafiq Islam, Khalfan Khamis Mohamed
 0.5: Rafiq Islam, John Walker Lindh
 0.5: Rafiq Islam, Abu Abdullah Shafae
 0.5: Peter Kinyanjui, Mohammad Omar
 0.5: Peter Kinyanjui, Imad Mugniyah
 0.5: Peter Kinyanjui, Eri Ziyad Abu Zaki

0.5: Peter Kinyanjui, Ahmed Omar Abdel Rahman
0.5: Peter Kinyanjui, Abu Malik
0.5: Osama Bin Laden, Tharwat Shihatah
0.5: Omar Ibn al Khattab, Sa'd Usama bin Laden
0.5: Omar Ibn al Khattab, Rafiq Islam
0.5: Omar Ibn al Khattab, Mohammad Omar
0.5: Omar Ibn al Khattab, Imad Mugnyiah
0.5: Omar Ibn al Khattab, Eri Ziyad Abu Zaki
0.5: Omar Ibn al Khattab, Ahmed Omar Abdel Rahman
0.5: Omar Ibn al Khattab, Abu Malik
0.5: Nizar Trabelsi, Eri Ziyad Abu Zaki
0.5: Nizar Ben Mohammed Nawar, Mouhamedou Ould Slehi
0.5: Munir al-Mutasaddiq, Mamoun Darkazanli
0.5: Munir Ali, Shafiq Rasul
0.5: Munir Ali, Asif Iqbal
0.5: Mubarak al-Duri, Sa'd Usama bin Laden
0.5: Mubarak al-Duri, Rafiq Islam
0.5: Mubarak al-Duri, Mohammad Omar
0.5: Mubarak al-Duri, Imad Mugnyiah
0.5: Mubarak al-Duri, Eri Ziyad Abu Zaki
0.5: Mubarak al-Duri, Ahmed Omar Abdel Rahman
0.5: Mubarak al-Duri, Abu Malik
0.5: Mohammed Saddiq Odeh, Mohammad Omar
0.5: Mohammed Saddiq Odeh, Eri Ziyad Abu Zaki
0.5: Mohammed Saddiq Odeh, Ahmed Omar Abdel Rahman
0.5: Mohammed Jamal Khalifa, Mohammad Omar
0.5: Mohammed Jamal Khalifa, Imad Mugnyiah
0.5: Mohammed Jamal Khalifa, Eri Ziyad Abu Zaki
0.5: Mohammed Jamal Khalifa, Ahmed Omar Abdel Rahman
0.5: Mohammed Jamal Khalifa, Abu Malik
0.5: Mohammed Abdel-Rahman, Omar Abd al-Rahman
0.5: Mohammad Omar, Shaikh Saïid
0.5: Mohammad Omar, Nizar Trabelsi
0.5: Mohammad Omar, Mohamed Rashed Daoud Owhali
0.5: Mohammad Omar, Mamdouh Mahmud Salim
0.5: Mohammad Omar, Majid Shimari
0.5: Mohammad Omar, Abu Abdullah Shafae
0.5: Mohamed Rashed Daoud Owhali, Eri Ziyad Abu Zaki
0.5: Mohamed Rashed Daoud Owhali, Ahmed Omar Abdel Rahman
0.5: Mamoun Darkazanli, Mohammed Haydar Zammar
0.5: Mamdouh Mahmud Salim, Eri Ziyad Abu Zaki
0.5: Majid Shimari, Eri Ziyad Abu Zaki
0.5: Latif Mansour, Mohammad Omar
0.5: Latif Mansour, Imad Mugnyiah
0.5: Latif Mansour, Eri Ziyad Abu Zaki
0.5: Latif Mansour, Ahmed Omar Abdel Rahman
0.5: Lased Ben Henin, Essoussi Laaroussi
0.5: Lamine Maroni, Fouhad Sabour
0.5: Khalid al Fawwaz, Rafiq Islam
0.5: Khalid al Fawwaz, Mohammad Omar
0.5: Khalid al Fawwaz, Imad Mugnyiah
0.5: Khalid al Fawwaz, Eri Ziyad Abu Zaki

0.5: Khalid al Fawwaz, Ahmed Omar Abdel Rahman
0.5: Khalid al Fawwaz, Abu Malik
0.5: Khalfan Khamis Mohamed, Mohammad Omar
0.5: Khalfan Khamis Mohamed, Imad Mugnyah
0.5: Khalfan Khamis Mohamed, Eri Ziyad Abu Zaki
0.5: Khalfan Khamis Mohamed, Ahmed Omar Abdel Rahman
0.5: Khadafy Janjalani, Hector Janjalani
0.5: Khadafy Janjalani, Abu Sabaya
0.5: Khadafy Janjalani, Abdurajak Janjalani
0.5: Kamel Daoudi, Rafiq Islam
0.5: Kamel Daoudi, Mohammad Omar
0.5: Kamel Daoudi, Imad Mugnyah
0.5: Kamel Daoudi, Eri Ziyad Abu Zaki
0.5: Kamel Daoudi, Ahmed Omar Abdel Rahman
0.5: Kamel Daoudi, Abu Malik
0.5: John Walker Lindh, Mohammad Omar
0.5: John Walker Lindh, Imad Mugnyah
0.5: John Walker Lindh, Eri Ziyad Abu Zaki
0.5: John Walker Lindh, Ahmed Omar Abdel Rahman
0.5: John Walker Lindh, Abu Malik
0.5: Jean-Marc Granvisir, Rafiq Islam
0.5: Jean-Marc Granvisir, Mohammad Omar
0.5: Jean-Marc Granvisir, Imad Mugnyah
0.5: Jean-Marc Granvisir, Eri Ziyad Abu Zaki
0.5: Jean-Marc Granvisir, Ahmed Omar Abdel Rahman
0.5: Jean-Marc Granvisir, Abu Malik
0.5: Imad Mugnyah, Shaikh Saiid
0.5: Imad Mugnyah, Nizar Trabelsi
0.5: Imad Mugnyah, Mohammed Saddiq Odeh
0.5: Imad Mugnyah, Mohamed Rashed Daoud Owhali
0.5: Imad Mugnyah, Mamdouh Mahmud Salim
0.5: Imad Mugnyah, Majid Shimari
0.5: Imad Mugnyah, Abu Abdullah Shafae
0.5: Hector Janjalani, Abu Sabaya
0.5: Ghashub al-Abrash al-Ghalyun, Mohamed Setmarian Nasar
0.5: Fazlul Rehman Khalil, Imad Mugnyah
0.5: Asif Iqbal, Shafiq Rasul
0.5: Ahmed Omar Abdel Rahman, Shaikh Saiid
0.5: Ahmed Omar Abdel Rahman, Nizar Trabelsi
0.5: Ahmed Omar Abdel Rahman, Mamdouh Mahmud Salim
0.5: Ahmed Omar Abdel Rahman, Majid Shimari
0.5: Ahmed Omar Abdel Rahman, Abu Abdullah Shafae
0.5: Ahmed Ibrahim A. Al Haznawi, Ziad Samir Jarrah
0.5: Ahmed Ibrahim A. Al Haznawi, Zacarias Moussaoui
0.5: Ahmed Brahim, Mamoun Darkazanli
0.5: Ahmed Alnami, Ziad Samir Jarrah
0.5: Ahmed Alnami, Zacarias Moussaoui
0.5: Ahmad Al-Gamen, Sa'd Usama bin Laden
0.5: Ahmad Al-Gamen, Rafiq Islam
0.5: Ahmad Al-Gamen, Mohammad Omar
0.5: Ahmad Al-Gamen, Imad Mugnyah
0.5: Ahmad Al-Gamen, Eri Ziyad Abu Zaki

0.5: Ahmad Al-Gamen, Ahmed Omar Abdel Rahman
 0.5: Ahmad Al-Gamen, Abu Malik
 0.5: Ahma Aluan, Ustadz Nur Mohammed Umog
 0.5: Abu Malik, Shaikh Saiid
 0.5: Abu Malik, Nizar Trabelsi
 0.5: Abu Malik, Mohammed Saddiq Odeh
 0.5: Abu Malik, Mohamed Rashed Daoud Owhali
 0.5: Abu Malik, Mamdouh Mahmud Salim
 0.5: Abu Malik, Majid Shimari
 0.5: Abu Malik, Latif Mansour
 0.5: Abu Malik, Khalfan Khamis Mohamed
 0.5: Abu Malik, Essam Hafez Marzouk
 0.5: Abu Malik, Abu Abdullah Shafae
 0.5: Abu Abdullah Shafae, Eri Ziyad Abu Zaki
 0.5: Abdurajak Janjalani, Hector Janjalani
 0.5: Abdurajak Janjalani, Abu Sabaya
 0.5: Abdullah Ahmed Abdullah, Zayn-al-Abidin Abu-Zubaydah
 0.5: Abdullah Ahmed Abdullah, Anas al-Liby
 0.5: Abdul Hai Mutmaen, Wakil Ahmed Muttawakil
 0.5: Abdul Hai Mutmaen, Abdul Salam Zaeef
 0.5: Abdalrahman Alarnaot Abu-Aljer, Ghashub al-Abrash al-Ghalyun
 0.45: Zayn-al-Abidin Abu-Zubaydah, Muhammad Atef
 0.4: Sulaiman Abu Ghaith, Fazlul Rehman Khalil
 0.4: Saif Al-Adel, Sulaiman Abu Ghaith
 0.4: Ahmad Mohammad Ali al-Hada, Sameer Mohammed Ahmed al-Hada
 0.4: Abdullah Ahmed Abdullah, Imad Mugniyah
 0.4: Abdullah Ahmed Abdullah, Ayman Mohammed Rabie al-Zawahiri
 0.38: Zayn-al-Abidin Abu-Zubaydah, Saif Al-Adel
 0.38: Salem Alhazmi, Mohand Alshehri
 0.38: Salem Alhazmi, Mohammed Atta
 0.38: Salem Alhazmi, Khalid Almihdhar
 0.38: Salem Alhazmi, Ahmed Alnami
 0.38: Saif Al-Adel, Anas al-Liby
 0.38: Saeed Alghamdi, Salem Alhazmi
 0.38: Saeed Alghamdi, Nawaf Alhazmi
 0.38: Saeed Alghamdi, Mohand Alshehri
 0.38: Saeed Alghamdi, Majed Moqed
 0.38: Saeed Alghamdi, Hani Hanjour
 0.38: Nawaf Alhazmi, Mohand Alshehri
 0.38: Nawaf Alhazmi, Mohammed Atta
 0.38: Nawaf Alhazmi, Khalid Almihdhar
 0.38: Nawaf Alhazmi, Ahmed Alnami
 0.38: Mohand Alshehri, Majed Moqed
 0.38: Mohand Alshehri, Hani Hanjour
 0.38: Mohammed Atta, Majed Moqed
 0.38: Mohammed Atta, Hani Hanjour
 0.38: Marwan Al-Shehhi, Salem Alhazmi
 0.38: Marwan Al-Shehhi, Saeed Alghamdi
 0.38: Marwan Al-Shehhi, Nawaf Alhazmi
 0.38: Marwan Al-Shehhi, Majed Moqed
 0.38: Marwan Al-Shehhi, Hani Hanjour
 0.38: Marwan Al-Shehhi, Ahmed Ibrahim A. Al Haznawi

0.38: Marwan Al-Shehhi, Ahmed Alnami
 0.38: Khalid Almihdhar, Majed Moqed
 0.38: Khalid Almihdhar, Hani Hanjour
 0.38: Hamza Alghamdi, Salem Alhazmi
 0.38: Hamza Alghamdi, Saeed Alghamdi
 0.38: Hamza Alghamdi, Nawaf Alhazmi
 0.38: Hamza Alghamdi, Majed Moqed
 0.38: Hamza Alghamdi, Hani Hanjour
 0.38: Hamza Alghamdi, Ahmed Alnami
 0.38: Ayman Mohammed Rabie al-Zawahiri, Muhammad Atef
 0.38: Ahmed Ibrahim A. Al Haznawi, Salem Alhazmi
 0.38: Ahmed Ibrahim A. Al Haznawi, Nawaf Alhazmi
 0.38: Ahmed Ibrahim A. Al Haznawi, Mohand Alshehri
 0.38: Ahmed Ibrahim A. Al Haznawi, Majed Moqed
 0.38: Ahmed Ibrahim A. Al Haznawi, Hani Hanjour
 0.38: Ahmed Ibrahim A. Al Haznawi, Hamza Alghamdi
 0.38: Ahmed Ibrahim A. Al Haznawi, Ahmed Alghamdi
 0.38: Ahmed Alnami, Mohand Alshehri
 0.38: Ahmed Alnami, Majed Moqed
 0.38: Ahmed Alnami, Hani Hanjour
 0.38: Ahmed Alghamdi, Salem Alhazmi
 0.38: Ahmed Alghamdi, Saeed Alghamdi
 0.38: Ahmed Alghamdi, Nawaf Alhazmi
 0.38: Ahmed Alghamdi, Majed Moqed
 0.38: Ahmed Alghamdi, Hani Hanjour
 0.38: Ahmed Alghamdi, Ahmed Alnami
 0.33: Wakil Ahmed Muttawakil, Mohammad Omar
 0.33: Tarek Chaarabi, Essoussi Laaroussi
 0.33: Sulaiman Abu Ghaith, Sheikh Mir Hamza
 0.33: Sulaiman Abu Ghaith, Shaikh Saiid
 0.33: Sulaiman Abu Ghaith, Peter Kinyanjui
 0.33: Sulaiman Abu Ghaith, Nizar Trabelsi
 0.33: Sulaiman Abu Ghaith, Mohammed Saddiq Odeh
 0.33: Sulaiman Abu Ghaith, Mohammed Jamal Khalifa
 0.33: Sulaiman Abu Ghaith, Mohamed Rashed Daoud Owthali
 0.33: Sulaiman Abu Ghaith, Mamdouh Mahmud Salim
 0.33: Sulaiman Abu Ghaith, Majid Shimari
 0.33: Sulaiman Abu Ghaith, Latif Mansour
 0.33: Sulaiman Abu Ghaith, Khalfan Khamis Mohamed
 0.33: Sulaiman Abu Ghaith, John Walker Lindh
 0.33: Sulaiman Abu Ghaith, Jean-Marc Granvisir
 0.33: Sulaiman Abu Ghaith, Abu Abdullah Shafae
 0.33: Sofiane Laimeche, Malek Seif
 0.33: Sheikh Mir Hamza, Abdul Salam Zaeef
 0.33: Sheikh Mir Hamza, Abdul Hai Mutmaen
 0.33: Shaikh Saiid, Abdul Salam Zaeef
 0.33: Shafiq Rasul, Jamal Udeen
 0.33: Saif Al-Adel, Fazlul Rehman Khalil
 0.33: Said Bahaji, Christian Manfred G.
 0.33: Sa'd Usama bin Laden, Rafiq Islam
 0.33: Sa'd Usama bin Laden, Mohammad Omar
 0.33: Sa'd Usama bin Laden, Imad Mugniyah

0.33: Sa'd Usama bin Laden, Eri Ziyad Abu Zaki
 0.33: Sa'd Usama bin Laden, Ahmed Omar Abdel Rahman
 0.33: Sa'd Usama bin Laden, Abu Malik
 0.33: Rafiq Islam, Mohammad Omar
 0.33: Rafiq Islam, Imad Mugniyah
 0.33: Rafiq Islam, Eri Ziyad Abu Zaki
 0.33: Rafiq Islam, Ahmed Omar Abdel Rahman
 0.33: Rafiq Islam, Abu Malik
 0.33: Peter Kinyanjui, Abdul Salam Zaef
 0.33: Peter Kinyanjui, Abdul Hai Mutmaen
 0.33: Omar Ibn al Khattab, Sulaiman Abu Ghaith
 0.33: Omar Ibn al Khattab, Djamal Beghal
 0.33: Omar Ibn al Khattab, Abdul Salam Zaef
 0.33: Omar Ibn al Khattab, Abdul Hai Mutmaen
 0.33: Nizar Trabelsi, Abdul Salam Zaef
 0.33: Munir al-Mutasaddiq, Mohammed Haydar Zammar
 0.33: Munir al-Mutasaddiq, Ahmed Brahim
 0.33: Munir Ali, Jamal Udeen
 0.33: Mubarak al-Duri, Sulaiman Abu Ghaith
 0.33: Mubarak al-Duri, Djamal Beghal
 0.33: Mubarak al-Duri, Abdul Salam Zaef
 0.33: Mubarak al-Duri, Abdul Hai Mutmaen
 0.33: Mouhamedou Ould Slehi, Abdel Ghani Rabia
 0.33: Mohammed Saddiq Odeh, Abdul Salam Zaef
 0.33: Mohammed Jamal Khalifa, Abdul Salam Zaef
 0.33: Mohammed Jamal Khalifa, Abdul Hai Mutmaen
 0.33: Mohammed Abdel-Rahman, Ahmed Omar Abdel Rahman
 0.33: Mohammad Omar, Eri Ziyad Abu Zaki
 0.33: Mohammad Omar, Ahmed Omar Abdel Rahman
 0.33: Mohamed Rashed Daoud Owahli, Abdul Salam Zaef
 0.33: Maulvi Abdul Kabir, Abdul Salam Zaef
 0.33: Maulvi Abdul Kabir, Abdul Hai Mutmaen
 0.33: Mamoun Darkazanli, Sulaiman Abu Ghaith
 0.33: Mamdouh Mahmud Salim, Abdul Salam Zaef
 0.33: Majid Shimari, Abdul Salam Zaef
 0.33: Latif Mansour, Abdul Salam Zaef
 0.33: Latif Mansour, Abdul Hai Mutmaen
 0.33: Lased Ben Henin, Mehdi Khammoun
 0.33: Khalid al-Shanqiti, Christian Manfred G.
 0.33: Khalid al Fawwaz, Sulaiman Abu Ghaith
 0.33: Khalid al Fawwaz, Abdul Salam Zaef
 0.33: Khalid al Fawwaz, Abdul Hai Mutmaen
 0.33: Khalfan Khamis Mohamed, Abdul Salam Zaef
 0.33: Khalfan Khamis Mohamed, Abdul Hai Mutmaen
 0.33: Kamel Daoudi, Sulaiman Abu Ghaith
 0.33: Kamel Daoudi, Abdul Salam Zaef
 0.33: Kamel Daoudi, Abdul Hai Mutmaen
 0.33: Junior Jikiron, Abu Sabaya
 0.33: John Walker Lindh, Abdul Salam Zaef
 0.33: John Walker Lindh, Abdul Hai Mutmaen
 0.33: Jean-Marc Granvisir, Abdul Salam Zaef
 0.33: Jean-Marc Granvisir, Abdul Hai Mutmaen

0.33: Imad Mugniyah, Mohammad Omar
 0.33: Imad Mugniyah, Eri Ziyad Abu Zaki
 0.33: Imad Mugniyah, Ahmed Omar Abdel Rahman
 0.33: Hector Janjalani, Junior Jikiron
 0.33: Ghashub al-Abrash al-Ghalyun, Abdul Fatath Zammar
 0.33: Djamel Beghal, Sheikh Mir Hamza
 0.33: Djamel Beghal, Shaihk Saiid
 0.33: Djamel Beghal, Richard Reid
 0.33: Djamel Beghal, Peter Kinyanjui
 0.33: Djamel Beghal, Nizar Trabelsi
 0.33: Djamel Beghal, Mohammed Saddiq Odeh
 0.33: Djamel Beghal, Mohammed Jamal Khalifa
 0.33: Djamel Beghal, Mohamed Rashed Daoud Owhali
 0.33: Djamel Beghal, Mamdouh Mahmud Salim
 0.33: Djamel Beghal, Majid Shimari
 0.33: Djamel Beghal, Latif Mansour
 0.33: Djamel Beghal, Khalid al Fawwaz
 0.33: Djamel Beghal, Khalfan Khamis Mohamed
 0.33: Djamel Beghal, Kamel Daoudi
 0.33: Djamel Beghal, John Walker Lindh
 0.33: Djamel Beghal, Jean-Marc Granvisir
 0.33: Djamel Beghal, Abu Abdullah Shafae
 0.33: Asif Iqbal, Jamal Udeen
 0.33: Anas al-Liby, Muhammad Atef
 0.33: Ahmed Omar Abdel Rahman, Eri Ziyad Abu Zaki
 0.33: Ahmed Brahim, Mohammed Haydar Zammar
 0.33: Ahmad Al-Gamen, Sulaiman Abu Ghaith
 0.33: Ahmad Al-Gamen, Djamel Beghal
 0.33: Ahmad Al-Gamen, Abdul Salam Zaef
 0.33: Ahmad Al-Gamen, Abdul Hai Mutmaen
 0.33: Abu Malik, Mohammad Omar
 0.33: Abu Malik, Imad Mugniyah
 0.33: Abu Malik, Eri Ziyad Abu Zaki
 0.33: Abu Malik, Ahmed Omar Abdel Rahman
 0.33: Abu Abdullah Shafae, Abdul Salam Zaef
 0.33: Abdurajak Janjalani, Junior Jikiron
 0.33: Abdullah Ahmed Abdullah, Sulaiman Abu Ghaith
 0.33: Abdul Hai Mutmaen, Shaihk Saiid
 0.33: Abdul Hai Mutmaen, Nizar Trabelsi
 0.33: Abdul Hai Mutmaen, Mohammed Saddiq Odeh
 0.33: Abdul Hai Mutmaen, Mohamed Rashed Daoud Owhali
 0.33: Abdul Hai Mutmaen, Mamdouh Mahmud Salim
 0.33: Abdul Hai Mutmaen, Majid Shimari
 0.33: Abdul Hai Mutmaen, Abu Abdullah Shafae
 0.3: Zacariah Essabar, Ziad Samir Jarrah
 0.3: Zacariah Essabar, Zacarias Moussaoui
 0.3: Saif Al-Adel, Ayman Mohammed Rabie al-Zawahiri

A20. Pairs of people names with transitive closure of PRP ≥ 3

Percentage of Total: 17.4095 %

Number of Pairs: 1371

Not Shown. Available upon request.

A21. Pairs of related people names with RPP ≥ 3

Percentage of Total: 2.5268 %

Number of Pairs: 146

- 1: Sulaiman Abu Ghaith, Abdullah Ahmed Abdullah
- 1: Rifa'i Taha Musa, Ali al-Rashidi
- 1: Refaei Ahmed Taha, Sheikh Mir Hamza
- 1: Noor Mohammad Saqib, Abdul Salam Zaeef
- 1: Nabil Sayadi, Nabil Nanakli Kosaibati
- 1: Nabil Sayadi, Mohamad Bahaih
- 1: Nabil Sayadi, Ghashub al-Abrash al-Ghalyun
- 1: Nabil Nanakli Kosaibati, Ghashub al-Abrash al-Ghalyun
- 1: Mohamed Sliti, Ahmad Shah Masud
- 1: Mohamad Bahaih, Nabil Nanakli Kosaibati
- 1: Mohamad Bahaih, Ghashub al-Abrash al-Ghalyun
- 1: Khalid Shaikh Mohammed, Abdul Rahman Yasin
- 1: Bouraoui El-Ouaer, Mohamed Sliti
- 1: Bouraoui El-Ouaer, Ahmad Shah Masud
- 1: Abdul Fatath Zammar, Nabil Sayadi
- 1: Abdul Fatath Zammar, Nabil Nanakli Kosaibati
- 1: Abdul Fatath Zammar, Mohamad Bahaih
- 1: Abdul Fatath Zammar, Ghashub al-Abrash al-Ghalyun
- 0.82: Waleed M. Alshehri, Satam M.A. Al Suqami
- 0.8: Wail M. Alshehri, Abdulaziz Alomari
- 0.8: Saif Al-Adel, Sulaiman Abu Ghaith
- 0.8: Saif Al-Adel, Abdullah Ahmed Abdullah
- 0.78: Waleed M. Alshehri, Wail M. Alshehri
- 0.78: Mohand Alshehri, Hamza Alghamdi
- 0.78: Mohand Alshehri, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
- 0.78: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Hamza Alghamdi
- 0.74: Wail M. Alshehri, Satam M.A. Al Suqami
- 0.7: Waleed M. Alshehri, Abdulaziz Alomari
- 0.7: Mohand Alshehri, Ahmed Alghamdi
- 0.7: Ahmed Alghamdi, Hamza Alghamdi
- 0.7: Ahmed Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
- 0.67: Sameer Mohammed Ahmed al-Hada, Mustafa Abdulkader Aabed al-Ansari
- 0.67: Muhammad Atef, Saif Al-Adel
- 0.67: Muhammad Atef, Anas al-Liby
- 0.67: Anas al-Liby, Saif Al-Adel
- 0.67: Ahmad Mohammad Ali al-Hada, Mustafa Abdulkader Aabed al-Ansari
- 0.67: Abdulaziz Alomari, Satam M.A. Al Suqami
- 0.65: Mohammed Atta, Abdulaziz Alomari
- 0.64: Mohand Alshehri, Marwan al-Shehhi
- 0.64: Mohammed Atta, Wail M. Alshehri
- 0.64: Marwan al-Shehhi, Hamza Alghamdi
- 0.64: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Marwan al-Shehhi
- 0.6: Salem Alhazmi, Majed Moqed
- 0.6: Saeed Alghamdi, Ahmed Ibrahim A. Al Haznawi

0.6: Saeed Alghamdi, Ahmed Alnami
 0.6: Ahmed Alnami, Ahmed Ibrahim A. Al Haznawi
 0.58: Ahmed Alghamdi, Marwan al-Shehhi
 0.56: Mohammed Atta, Waleed M. Alshehri
 0.54: Mohammed Atta, Satam M.A. Al Suqami
 0.5: Ziad Samir Jarrah, Saeed Alghamdi
 0.5: Ziad Samir Jarrah, Ahmed Ibrahim A. Al Haznawi
 0.5: Ziad Samir Jarrah, Ahmed Alnami
 0.5: Tarek Maaroufi, Ahmad Shah Masud
 0.5: Shafiq Rasul, Munir Ali
 0.5: Shafiq Rasul, Asif Iqbal
 0.5: Sameer Mohammed Ahmed al-Hada, Fawaz Yahya Al-Rabeei
 0.5: Noor Mohammad Saqib, Abdul Hai Mutmaen
 0.5: Nawaf Alhazmi, Salem Alhazmi
 0.5: Nawaf Alhazmi, Majed Moqed
 0.5: Mullah Mohammad Omar, Abdul Hai Mutmaen
 0.5: Muhammad Atef, Sulaiman Abu Ghaith
 0.5: Muhammad Atef, Abdullah Ahmed Abdullah
 0.5: Mohammed bin Laden, Rifa'i Taha Musa
 0.5: Mohammed bin Laden, Ali al-Rashidi
 0.5: Mohamed Sliti, Tarek Maaroufi
 0.5: Mamoun Darkazanli, Nabil Sayadi
 0.5: Mamoun Darkazanli, Nabil Nanakli Kosaibati
 0.5: Mamoun Darkazanli, Mohamad Bahaih
 0.5: Mamoun Darkazanli, Ghashub al-Abrash al-Ghalyun
 0.5: Mamoun Darkazanli, Abdul Fatath Zammar
 0.5: Lotfi Raissi, Faisal Al Salmi
 0.5: Junior Jikiron, Ustadz Nur Mohammed Umog
 0.5: Junior Jikiron, Ahma Aluan
 0.5: Imad Eddin Barakat, Nabil Sayadi
 0.5: Imad Eddin Barakat, Nabil Nanakli Kosaibati
 0.5: Imad Eddin Barakat, Mohamad Bahaih
 0.5: Imad Eddin Barakat, Ghashub al-Abrash al-Ghalyun
 0.5: Imad Eddin Barakat, Abdul Fatath Zammar
 0.5: Hector Janjalani, Abu Sabaya
 0.5: Bouraoui El-Ouaer, Tarek Maaroufi
 0.5: Bashir-ud-Din Mahmood, Tharwat Shihatah
 0.5: Asif Iqbal, Munir Ali
 0.5: Anas al-Liby, Sulaiman Abu Ghaith
 0.5: Anas al-Liby, Abdullah Ahmed Abdullah
 0.5: Abdul Majid, Bashir-ud-Din Mahmood
 0.5: Abdul Hai Mutmaen, Abdul Salam Zaeef
 0.47: Ahmed Alghamdi, Satam M.A. Al Suqami
 0.44: Waleed M. Alshehri, Hamza Alghamdi
 0.44: Waleed M. Alshehri, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.44: Mohand Alshehri, Waleed M. Alshehri
 0.43: Hani Hanjour, Salem Alhazmi
 0.43: Hani Hanjour, Majed Moqed
 0.42: Wail M. Alshehri, Marwan al-Shehhi
 0.41: Satam M.A. Al Suqami, Hamza Alghamdi
 0.41: Mohand Alshehri, Satam M.A. Al Suqami
 0.41: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Satam M.A. Al Suqami

0.41: Ahmed Alghamdi, Waleed M. Alshehri
 0.4: Shafiq Rasul, Ruhai Ahmed
 0.4: Ruhai Ahmed, Munir Ali
 0.4: Mullah Mohammad Omar, Wakil Ahmed Muttawakil
 0.4: Khadafy Janjalani, Abu Sabaya
 0.4: Hector Janjalani, Khadafy Janjalani
 0.4: Asif Iqbal, Ruhai Ahmed
 0.4: Abdurajak Janjalani, Junior Jikiron
 0.39: Waleed M. Alshehri, Marwan al-Shehhi
 0.39: Wail M. Alshehri, Hamza Alghamdi
 0.39: Mohand Alshehri, Wail M. Alshehri
 0.39: Fayeze Rashid Ahmed Hassan Al Qadi Banihammad, Wail M. Alshehri
 0.38: Zacarias Moussaoui, Saeed Alghamdi
 0.38: Zacarias Moussaoui, Ahmed Ibrahim A. Al Haznawi
 0.38: Zacarias Moussaoui, Ahmed Alnami
 0.38: Nawaf Alhazmi, Hani Hanjour
 0.38: Khalid Almihdhar, Salem Alhazmi
 0.38: Khalid Almihdhar, Majed Moqed
 0.38: Ayman aL- Zawahiri, Muhammad Atef
 0.38: Abdulaziz Alomari, Marwan al-Shehhi
 0.37: Marwan al-Shehhi, Satam M.A. Al Suqami
 0.37: Ahmed Alghamdi, Wail M. Alshehri
 0.36: Mohammed Atta, Marwan al-Shehhi
 0.35: Mohand Alshehri, Abdulaziz Alomari
 0.35: Fayeze Rashid Ahmed Hassan Al Qadi Banihammad, Abdulaziz Alomari
 0.35: Abdulaziz Alomari, Hamza Alghamdi
 0.33: Zacarias Moussaoui, Ziad Samir Jarrah
 0.33: Wakil Ahmed Muttawakil, Noor Mohammad Saqib
 0.33: Wakil Ahmed Muttawakil, Abdul Salam Zaef
 0.33: Sameer Mohammed Ahmed al-Hada, Ahmad Mohammad Ali al-Hada
 0.33: Nizar Ben Mohammed Nawar, Jerome Courtailler
 0.33: Mustafa Abdulkader Aabed al-Ansari, Fawaz Yahya Al-Rabeei
 0.33: Muhammad Galeb Kalaje Zouaydi, Mamoun Darkazanli
 0.33: Mohammed Atta, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad
 0.33: Lamine Maroni, Salim Boukhari
 0.33: Lamine Maroni, Haydar Abu Doha
 0.33: Lamine Maroni, Fouhad Sabour
 0.33: Khalid Almihdhar, Nawaf Alhazmi
 0.33: Imad Eddin Barakat, Mamoun Darkazanli
 0.33: Haydar Abu Doha, Salim Boukhari
 0.33: Haydar Abu Doha, Fouhad Sabour
 0.33: Fouhad Sabour, Salim Boukhari
 0.33: Ayman Mohammed Rabie aL- Zawahiri, Rifa'i Taha Musa
 0.33: Ayman Mohammed Rabie aL- Zawahiri, Mohammed Omar
 0.33: Ayman Mohammed Rabie aL- Zawahiri, Ali al-Rashidi
 0.33: Ahmed Alghamdi, Abdulaziz Alomari
 0.33: Ahmed Abdel-Rahman, Omar Abd al-Rahman
 0.33: Abdurajak Janjalani, Hector Janjalani
 0.33: Abdurajak Janjalani, Abu Sabaya
 0.3: Khalid Almihdhar, Hani Hanjour

A22. Pairs of related people names with transitive closure of RPP ≥ 3

Percentage of Total: 3.1326 %

Number of Pairs: 181

- 1: Sulaiman Abu Ghaith, Abdullah Ahmed Abdullah
- 1: Rifa'i Taha Musa, Ali al-Rashidi
- 1: Refaei Ahmed Taha, Sheikh Mir Hamza
- 1: Noor Mohammad Saqib, Abdul Salam Zaeef
- 1: Nabil Sayadi, Nabil Nanakli Kosaibati
- 1: Nabil Sayadi, Mohamad Bahaih
- 1: Nabil Sayadi, Ghashub al-Abrash al-Ghalyun
- 1: Nabil Nanakli Kosaibati, Ghashub al-Abrash al-Ghalyun
- 1: Mohamed Sliti, Ahmad Shah Masud
- 1: Mohamad Bahaih, Nabil Nanakli Kosaibati
- 1: Mohamad Bahaih, Ghashub al-Abrash al-Ghalyun
- 1: Khalid Shaikh Mohammed, Abdul Rahman Yasin
- 1: Bouraoui El-Ouaer, Mohamed Sliti
- 1: Bouraoui El-Ouaer, Ahmad Shah Masud
- 1: Abdul Fatath Zammar, Nabil Sayadi
- 1: Abdul Fatath Zammar, Nabil Nanakli Kosaibati
- 1: Abdul Fatath Zammar, Mohamad Bahaih
- 1: Abdul Fatath Zammar, Ghashub al-Abrash al-Ghalyun
- 0.82: Waleed M. Alshehri, Satam M.A. Al Suqami
- 0.8: Wail M. Alshehri, Abdulaziz Alomari
- 0.8: Saif Al-Adel, Sulaiman Abu Ghaith
- 0.8: Saif Al-Adel, Abdullah Ahmed Abdullah
- 0.78: Waleed M. Alshehri, Wail M. Alshehri
- 0.78: Waleed M. Alshehri, Abdulaziz Alomari
- 0.78: Wail M. Alshehri, Satam M.A. Al Suqami
- 0.78: Mohand Alshehri, Hamza Alghamdi
- 0.78: Mohand Alshehri, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
- 0.78: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Hamza Alghamdi
- 0.78: Abdulaziz Alomari, Satam M.A. Al Suqami
- 0.7: Mohand Alshehri, Ahmed Alghamdi
- 0.7: Ahmed Alghamdi, Hamza Alghamdi
- 0.7: Ahmed Alghamdi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
- 0.67: Sameer Mohammed Ahmed al-Hada, Mustafa Abdulkader Aabed al-Ansari
- 0.67: Sameer Mohammed Ahmed al-Hada, Ahmad Mohammad Ali al-Hada
- 0.67: Muhammad Atef, Sulaiman Abu Ghaith
- 0.67: Muhammad Atef, Saif Al-Adel
- 0.67: Muhammad Atef, Anas al-Liby
- 0.67: Muhammad Atef, Abdullah Ahmed Abdullah
- 0.67: Anas al-Liby, Sulaiman Abu Ghaith
- 0.67: Anas al-Liby, Saif Al-Adel
- 0.67: Anas al-Liby, Abdullah Ahmed Abdullah
- 0.67: Ahmad Mohammad Ali al-Hada, Mustafa Abdulkader Aabed al-Ansari
- 0.65: Mohammed Atta, Waleed M. Alshehri
- 0.65: Mohammed Atta, Wail M. Alshehri
- 0.65: Mohammed Atta, Satam M.A. Al Suqami
- 0.65: Mohammed Atta, Abdulaziz Alomari
- 0.64: Mohand Alshehri, Marwan al-Shehhi
- 0.64: Marwan al-Shehhi, Hamza Alghamdi
- 0.64: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Marwan al-Shehhi

0.64: Ahmed Alghamdi, Marwan al-Shehhi
 0.6: Salem Alhazmi, Majed Moqed
 0.6: Saeed Alghamdi, Ahmed Ibrahim A. Al Haznawi
 0.6: Saeed Alghamdi, Ahmed Alnami
 0.6: Ahmed Alnami, Ahmed Ibrahim A. Al Haznawi
 0.5: Ziad Samir Jarrah, Saeed Alghamdi
 0.5: Ziad Samir Jarrah, Ahmed Ibrahim A. Al Haznawi
 0.5: Ziad Samir Jarrah, Ahmed Alnami
 0.5: Ustadz Nur Mohammed Umog, Ahma Aluan
 0.5: Tarek Maaroufi, Ahmad Shah Masud
 0.5: Shafiq Rasul, Munir Ali
 0.5: Shafiq Rasul, Asif Iqbal
 0.5: Sameer Mohammed Ahmed al-Hada, Fawaz Yahya Al-Rabeei
 0.5: Noor Mohammad Saqib, Abdul Hai Mutmaen
 0.5: Nawaf Alhazmi, Salem Alhazmi
 0.5: Nawaf Alhazmi, Majed Moqed
 0.5: Mustafa Abdulkader Aabed al-Ansari, Fawaz Yahya Al-Rabeei
 0.5: Mullah Mohammad Omar, Noor Mohammad Saqib
 0.5: Mullah Mohammad Omar, Abdul Salam Zaeef
 0.5: Mullah Mohammad Omar, Abdul Hai Mutmaen
 0.5: Mohammed bin Laden, Rifa'i Taha Musa
 0.5: Mohammed bin Laden, Ali al-Rashidi
 0.5: Mohamed Sliti, Tarek Maaroufi
 0.5: Mamoun Darkazanli, Nabil Sayadi
 0.5: Mamoun Darkazanli, Nabil Nanakli Kosaibati
 0.5: Mamoun Darkazanli, Mohamad Bahaih
 0.5: Mamoun Darkazanli, Ghashub al-Abrash al-Ghalyun
 0.5: Mamoun Darkazanli, Abdul Fatath Zammar
 0.5: Lotfi Raissi, Faisal Al Salmi
 0.5: Junior Jikiron, Ustadz Nur Mohammed Umog
 0.5: Junior Jikiron, Ahma Aluan
 0.5: Imad Eddin Barakat, Nabil Sayadi
 0.5: Imad Eddin Barakat, Nabil Nanakli Kosaibati
 0.5: Imad Eddin Barakat, Mohamad Bahaih
 0.5: Imad Eddin Barakat, Mamoun Darkazanli
 0.5: Imad Eddin Barakat, Ghashub al-Abrash al-Ghalyun
 0.5: Imad Eddin Barakat, Abdul Fatath Zammar
 0.5: Hector Janjalani, Abu Sabaya
 0.5: Bouraoui El-Ouaer, Tarek Maaroufi
 0.5: Bashir-ud-Din Mahmood, Tharwat Shihatah
 0.5: Asif Iqbal, Munir Ali
 0.5: Ahmad Mohammad Ali al-Hada, Fawaz Yahya Al-Rabeei
 0.5: Abdul Majid, Tharwat Shihatah
 0.5: Abdul Majid, Bashir-ud-Din Mahmood
 0.5: Abdul Hai Mutmaen, Abdul Salam Zaeef
 0.47: Waleed M. Alshehri, Marwan al-Shehhi
 0.47: Waleed M. Alshehri, Hamza Alghamdi
 0.47: Waleed M. Alshehri, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.47: Wail M. Alshehri, Marwan al-Shehhi
 0.47: Wail M. Alshehri, Hamza Alghamdi
 0.47: Satam M.A. Al Suqami, Hamza Alghamdi
 0.47: Mohand Alshehri, Waleed M. Alshehri

0.47: Mohand Alshehri, Wail M. Alshehri
 0.47: Mohand Alshehri, Satam M.A. Al Suqami
 0.47: Mohand Alshehri, Abdulaziz Alomari
 0.47: Mohammed Atta, Mohand Alshehri
 0.47: Mohammed Atta, Marwan al-Shehhi
 0.47: Mohammed Atta, Hamza Alghamdi
 0.47: Mohammed Atta, Fayez Rashid Ahmed Hassan Al Qadi Banihammad
 0.47: Mohammed Atta, Ahmed Alghamdi
 0.47: Marwan al-Shehhi, Satam M.A. Al Suqami
 0.47: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Wail M. Alshehri
 0.47: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Satam M.A. Al Suqami
 0.47: Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Abdulaziz Alomari
 0.47: Ahmed Alghamdi, Waleed M. Alshehri
 0.47: Ahmed Alghamdi, Wail M. Alshehri
 0.47: Ahmed Alghamdi, Satam M.A. Al Suqami
 0.47: Ahmed Alghamdi, Abdulaziz Alomari
 0.47: Abdulaziz Alomari, Marwan al-Shehhi
 0.47: Abdulaziz Alomari, Hamza Alghamdi
 0.43: Nawaf Alhazmi, Hani Hanjour
 0.43: Hani Hanjour, Salem Alhazmi
 0.43: Hani Hanjour, Majed Moqed
 0.4: Wakil Ahmed Muttawakil, Noor Mohammad Saqib
 0.4: Wakil Ahmed Muttawakil, Abdul Salam Zaeef
 0.4: Wakil Ahmed Muttawakil, Abdul Hai Mutmaen
 0.4: Shafiq Rasul, Ruhul Ahmed
 0.4: Ruhul Ahmed, Munir Ali
 0.4: Mullah Mohammad Omar, Wakil Ahmed Muttawakil
 0.4: Khadafy Janjalani, Abu Sabaya
 0.4: Hector Janjalani, Khadafy Janjalani
 0.4: Asif Iqbal, Ruhul Ahmed
 0.4: Abdurajak Janjalani, Ustadz Nur Mohammed Umog
 0.4: Abdurajak Janjalani, Junior Jikiron
 0.4: Abdurajak Janjalani, Ahma Aluan
 0.38: Zacarias Moussaoui, Ziad Samir Jarrah
 0.38: Zacarias Moussaoui, Saeed Alghamdi
 0.38: Zacarias Moussaoui, Ahmed Ibrahim A. Al Haznawi
 0.38: Zacarias Moussaoui, Ahmed Alnami
 0.38: Khalid Almihdhar, Salem Alhazmi
 0.38: Khalid Almihdhar, Nawaf Alhazmi
 0.38: Khalid Almihdhar, Majed Moqed
 0.38: Khalid Almihdhar, Hani Hanjour
 0.38: Ayman aL- Zawahiri, Sulaiman Abu Ghaith
 0.38: Ayman aL- Zawahiri, Saif Al-Adel
 0.38: Ayman aL- Zawahiri, Muhammad Atef
 0.38: Ayman aL- Zawahiri, Anas al-Liby
 0.38: Ayman aL- Zawahiri, Abdullah Ahmed Abdullah
 0.33: Ustadz Nur Mohammed Umog, Abu Sabaya
 0.33: Nizar Ben Mohammed Nawar, Jerome Courtailler
 0.33: Muhammad Galeb Kalaje Zouaydi, Nabil Sayadi
 0.33: Muhammad Galeb Kalaje Zouaydi, Nabil Nanakli Kosaibati
 0.33: Muhammad Galeb Kalaje Zouaydi, Mohamad Bahaih
 0.33: Muhammad Galeb Kalaje Zouaydi, Mamoun Darkazanli

0.33: Muhammad Galeb Kalaje Zouaydi, Imad Eddin Barakat
 0.33: Muhammad Galeb Kalaje Zouaydi, Ghashub al-Abrash al-Ghalyun
 0.33: Muhammad Galeb Kalaje Zouaydi, Abdul Fatath Zammar
 0.33: Mohammed Omar, Rifa'i Taha Musa
 0.33: Mohammed Omar, Mohammed bin Laden
 0.33: Mohammed Omar, Ali al-Rashidi
 0.33: Lamine Maroni, Salim Boukhari
 0.33: Lamine Maroni, Haydar Abu Doha
 0.33: Lamine Maroni, Fouhad Sabour
 0.33: Khadafy Janjalani, Ustadz Nur Mohammed Umog
 0.33: Khadafy Janjalani, Junior Jikiron
 0.33: Khadafy Janjalani, Ahma Aluan
 0.33: Junior Jikiron, Abu Sabaya
 0.33: Hector Janjalani, Ustadz Nur Mohammed Umog
 0.33: Hector Janjalani, Junior Jikiron
 0.33: Hector Janjalani, Ahma Aluan
 0.33: Haydar Abu Doha, Salim Boukhari
 0.33: Haydar Abu Doha, Fouhad Sabour
 0.33: Fouhad Sabour, Salim Boukhari
 0.33: Ayman Mohammed Rabie aL- Zawahiri, Rifa'i Taha Musa
 0.33: Ayman Mohammed Rabie aL- Zawahiri, Mohammed Omar
 0.33: Ayman Mohammed Rabie aL- Zawahiri, Mohammed bin Laden
 0.33: Ayman Mohammed Rabie aL- Zawahiri, Ali al-Rashidi
 0.33: Ahmed Abdel-Rahman, Omar Abd al-Rahman
 0.33: Abu Sabaya, Ahma Aluan
 0.33: Abdurajak Janjalani, Khadafy Janjalani
 0.33: Abdurajak Janjalani, Hector Janjalani
 0.33: Abdurajak Janjalani, Abu Sabaya

APPENDIX B: SEMI-METRIC PAIRS

B1: PDP1

B1.1: Pairs of people names with $s \geq 2$

Mullah Mohammad Omar, Richard Reid: 2.7049
 Mohammed Atta, Ameer Bukhari: 2.7048
 Hani Hanjour, Haydar Abu Doha: 2.3788
 Mohammed Atta, Nawaf Alhazmi: 2.3162
 Hani Hanjour, Malek Seif: 2.2994
 Ayman aL- Zawahiri, Rifa'i Taha Musa: 2.2937
 Ayman aL- Zawahiri, Sayyid Qutb: 2.2937
 Khalid Almihdhar, Abu Bakar Bashir: 2.2244
 Ahmad Shah Masud, Bouraoui El-Ouaer: 2.16
 Ahmad Shah Masud, Mohamed Sliti: 2.16
 Ahmad Shah Masud, Tarek Chaarabi: 2.16
 Ahmad Shah Masud, Abdelsattar Dahmane: 2.16
 Ahmad Shah Masud, Sami Essid Ben Khemais: 2.16
 Ahmad Shah Masud, Mohamed Aouadi: 2.16
 Hani Hanjour, Zacarias Moussaoui: 2.1559
 Ayman aL- Zawahiri, Zayn-al-Abidin Abu-Zubaydah: 2.1545

Abdulaziz Alomari, Waleed M. Alshehri: 2.0657

B1.2: Pairs of people names with $rs \geq 0.25$

Mullah Mohammad Omar, Richard Reid: 0.6303
Ahmad Shah Masud, Richard Reid: 0.424
Richard Reid, Muhammad Atef: 0.3204
Ahmad Shah Masud, Zayn-al-Abidin Abu-Zubaydah: 0.2823
Mohammed Atta, Nawaf Alhazmi: 0.2783
Ahmad Shah Masud, Mohamed Sliti: 0.263
Ahmad Shah Masud, Sami Essid Ben Khemais: 0.263
Ahmad Shah Masud, Tarek Chaarabi: 0.263
Ahmad Shah Masud, Bouraoui El-Ouaer: 0.263
Ahmad Shah Masud, Abdelsattar Dahmane: 0.263
Ahmad Shah Masud, Mohamed Aouadi: 0.263
Hani Hanjour, Zacarias Moussaoui: 0.2626

B1.3: Pairs of people names with $b \geq 2$

Abdelsattar Dahmane, Mohamed Aouadi: 4.6667
Mohamed Aouadi, Mohamed Sliti: 4.6667
Mohamed Aouadi, Bouraoui El-Ouaer: 4.6667
Mohamed Sliti, Tarek Chaarabi: 4.6667
Tarek Chaarabi, Mohamed Sliti: 4.6667
Bouraoui El-Ouaer, Tarek Chaarabi: 4.6667
Tarek Chaarabi, Bouraoui El-Ouaer: 4.6667
Mohamed Aouadi, Abdelsattar Dahmane: 4.6667
Abdelsattar Dahmane, Tarek Chaarabi: 4.6667
Tarek Chaarabi, Abdelsattar Dahmane: 4.6667
Mohamed Sliti, Sami Essid Ben Khemais: 4.6667
Sami Essid Ben Khemais, Bouraoui El-Ouaer: 4.6667
Bouraoui El-Ouaer, Mohamed Aouadi: 4.6667
Sami Essid Ben Khemais, Mohamed Sliti: 4.6667
Bouraoui El-Ouaer, Sami Essid Ben Khemais: 4.6667
Sami Essid Ben Khemais, Abdelsattar Dahmane: 4.6667
Abdelsattar Dahmane, Sami Essid Ben Khemais: 4.6667
Mohamed Sliti, Mohamed Aouadi: 4.6667
Yacine Aknouche, Anas al-Liby: 3.3461
Richard Reid, Khalid Almihdhar: 3.2026
Richard Reid, Yazid Sufaat: 2.8697
Richard Reid, Nawaf Alhazmi: 2.8344
Richard Reid, Albader Alhazmi: 2.5705
Abdullah Ahmed Abdullah, Mohamed Rashed Daoud Owhali: 2.5271
Abdullah Ahmed Abdullah, Khalfan Khamis Mohamed: 2.5271
Mohammed Atta, Ameer Bukhari: 2.4663
Yacine Aknouche, Omar Bakri Mohammed: 2.2533
Khalil al-Dik, Khalfan Khamis Mohamed: 2.2325
Khalil al-Dik, Mohamed Rashed Daoud Owhali: 2.2325
Anas al-Liby, Yacine Aknouche: 2.2209
Yacine Aknouche, Sanjivan Ruprah: 2.1728
Mohammed Atta, Mohand Alshehri: 2.1586
Ahmad Shah Masud, Mohamed Sliti: 2.1063

Ahmad Shah Masud, Bouraoui El-Ouaer: 2.1063
Ahmad Shah Masud, Abdelsattar Dahmane: 2.1063
Ahmad Shah Masud, Tarek Chaarabi: 2.1063
Ahmad Shah Masud, Mohamed Aouadi: 2.1063
Ahmad Shah Masud, Sami Essid Ben Khemais: 2.1063
Mohamed Sliti, Omar Bakri Mohammed: 2.0741
Abdelsattar Dahmane, Omar Bakri Mohammed: 2.0741
Bouraoui El-Ouaer, Omar Bakri Mohammed: 2.0741
Tarek Chaarabi, Ahmed Ressay: 2.0151
Sami Essid Ben Khemais, Ahmed Ressay: 2.0151
Mohamed Aouadi, Ahmed Ressay: 2.0151
Richard Reid, Abu Bakar Bashir: 2.0136
Richard Reid, Ziad Samir Jarrah: 2.012

B2: CDP1

B2.1: Pairs of city names with $s \geq 2$

London, Miami: 3.6499
London, Seattle: 2.3686
London, Cote d'Azur: 2.3686
London, Hong Kong: 2.3686
London, Falls Church: 2.3686
London, Berlin: 2.3686
London, Columbus: 2.3686
London, Dubai: 2.1559
London, Minneapolis: 2.1559
Dar es Salaam, New York City: 2.0193
Nairobi, New York City: 2.0167
Dar es Salaam, Shanksville: 2.0024

B2.2: Pairs of city names with $rs \geq 0.25$

Dar es Salaam, New York City: 0.5048
Nairobi, New York City: 0.5041
Dar es Salaam, Shanksville: 0.5006
Nairobi, Shanksville: 0.5
Kabul, Islamabad: 0.3655
London, Miami: 0.3556
Washington D.C., Kandahar: 0.3347
London, Columbus: 0.283
London, Berlin: 0.283
London, Seattle: 0.283
London, Falls Church: 0.283
London, Hong Kong: 0.283
London, Cote d'Azur: 0.283
London, Dubai: 0.2626
London, Minneapolis: 0.2626
Kabul, Calcutta: 0.2521

B2.3: Pairs of city names with $b \geq 2$

Seattle, Khartoum: 3.5765
Hong Kong, Khartoum: 3.5765
Falls Church, Khartoum: 3.5765
Cote d'Azur, Khartoum: 3.5765
Columbus, Khartoum: 3.5765
Aden, Montreal: 3.0466
London, Daytona Beach: 2.5457
London, Amsterdam: 2.5457
London, Vienna: 2.5457
Hamburg, Amman: 2.3389
London, Boston: 2.305
Milan, Madrid: 2.2403
London, Khartoum: 2.0092

B3: PDP2

B3.1: Pairs of people names with $s \geq 2$

Zacarias Moussaoui, Hani Hanjour: 5.2931
Mohammed Atta, Salem Alhazmi: 5.2274
Zacarias Moussaoui, Sejahratul Dursina: 4.8148
Mohammed Atta, Wail M. Alshehri: 4.7741
Mohammed Atta, Nizar Ben Mohammed Nawar: 4.6628
Mohammed Atta, Ameer Bukhari: 4.4413
Mohammed Atta, Saeed Alghamdi: 4.3505
Zacarias Moussaoui, Suri Hanim Mohamad: 4.0734
Zacarias Moussaoui, Ahmad Yani: 4.0734
Mohammed Atta, Mohand Alshehri: 4.0522
Mohammed Atta, Marwan al-Barghuthi: 4.0522
Mohammed Atta, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 4.0522
Mohammed Atta, Satam M.A. Al Suqami: 4.0522
Mohammed Atta, Ahmed Ibrahim A. Al Haznawi: 3.9526
Mohammed Atta, Faisal Al Salmi: 3.7967
Mohammed Atta, Khalid al-Shanqiti: 3.6895
Mohammed Atta, Munir al-Mutasaddiq: 3.6895
Fathur Rohman al-Ghozi, Mohamad Khalim bin Jaffar: 3.6679
Mohammed Atta, Yazid Sufaat: 3.5728
Mohammed Atta, Ramadan Shalah: 3.4101
Wadih Hage, Ali Mohammad: 3.3856
Wadih Hage, L'Houssaine Kherchtou: 3.3856
Zacarias Moussaoui, Fathur Rohman al-Ghozi: 3.3653
Mohammed Atta, Abu Zubair: 3.3239
Mohammed Atta, Zacariah Essabar: 3.3113
Adnan Bukhari, Wail M. Alshehri: 3.2928
Zayn-al-Abidin Abu-Zubaydah, Anas al-Liby: 3.1995
Mohammed Atta, Abu Zaynab: 3.1904
Mohammed Atta, Abu Shala: 3.1904
Mohammed Atta, Gushuf: 3.1904
Zacarias Moussaoui, Lotfi Raissi: 3.1449
Muhammad Atef, Yasir al-Sirri: 3.1209
Mohammed Atta, Mohammed al Massari: 3.0481

Mohammed Atta, Abu Khalid: 3.0388
 Amer Kamfar, Wail M. Alshehri: 3.0002
 Ramzi Binalshibh, Nizar Ben Mohammed Nawar: 3
 Mohammed Atta, Abu al-Ilyas: 2.9703
 Khalid Almihdhar, Sejahratul Dursina: 2.969
 Mohammed Atta, Raed Hijazi: 2.9122
 Ayman Mohammed Rabie aL- Zawahiri, Sayyid Qutb: 2.873
 Ayman Mohammed Rabie aL- Zawahiri, Tal'at Fu'ad Qasim: 2.873
 Ayman Mohammed Rabie aL- Zawahiri, Ali al-Rashidi: 2.873
 Ayman Mohammed Rabie aL- Zawahiri, Muhammad Shawqi al-Islambuli: 2.873
 Richard Reid, Riduan Isamuddin: 2.8543
 Hani Hanjour, Saeed Alghamdi: 2.8078
 Zacarias Moussaoui, Albader Alhazmi: 2.7842
 Mohammad Omar, Yousaf Mirza: 2.7825
 Khalid Almihdhar, Saeed Alghamdi: 2.7806
 Mohammed Atta, Abdalrahman Alarnaot Abu-Aljer: 2.7788
 Mohammed Atta, Mohamed Setmariyan Nasar: 2.7788
 Nawaf Alhazmi, Fathur Rohman al-Ghozi: 2.7583
 Mohammed Atta, Djamal Beghal: 2.7416
 Zacarias Moussaoui, Mohammed al Massari: 2.7235
 Hani Hanjour, Wail M. Alshehri: 2.7176
 Mohammed Atta, Mamdouh Mahmud Salim: 2.6913
 Muhammad Atef, Jamal Ahmed al-Fadal: 2.689
 Mohammed Atta, Kamel Daoudi: 2.6834
 Khalid Almihdhar, Wail M. Alshehri: 2.6781
 Hani Hanjour, Waleed M. Alshehri: 2.6763
 Zacarias Moussaoui, Abdul Hakim Murad: 2.6716
 Mohammed Atta, Kamal Hadid Cha'r: 2.6707
 Ayman Mohammed Rabie aL- Zawahiri, Osama Rushdi: 2.667
 Khalid Almihdhar, Waleed M. Alshehri: 2.6386
 Zacarias Moussaoui, Ahmad Shah Masud: 2.6244
 Zacarias Moussaoui, Raed Hijazi: 2.5891
 Muhammad Atef, Tharwat Shihatah: 2.5533
 Muhammad Atef, Sayyid Qutb: 2.5533
 Richard Reid, Ramzi Yousef: 2.5475
 Richard Reid, Ayman Mohammed Rabie aL- Zawahiri: 2.5388
 Zayn-al-Abidin Abu-Zubaydah, Mohammed bin Laden: 2.5317
 Zayn-al-Abidin Abu-Zubaydah, Rifa'i Taha Musa: 2.5242
 Hani Hanjour, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad: 2.5179
 Hani Hanjour, Satam M.A. Al Suqami: 2.5179
 Hani Hanjour, Mohand Alshehri: 2.5179
 Mohammed Atta, Khalid al Fawwaz: 2.5111
 Mohammed Atta, John Walker Lindh: 2.4969
 Mohammed Atta, Christian Manfred G.: 2.4966
 Mohammed Atta, Majed Moqed: 2.4956
 Mohammed Atta, Moataz Al Hallak: 2.4804
 Mohammed Atta, Abdul Rehman Safani: 2.4804
 Ahmad Shah Masud, Mullah Mohammad Omar: 2.4722
 Zacarias Moussaoui, Ahmed Alghamdi: 2.4702
 Muhammad Atef, Ahmed bin Laden: 2.4622
 Muhammad Atef, Hamza bin Ladin: 2.4622
 Khalid Almihdhar, Mohand Alshehri: 2.4561

Khalid Almihdhar, Satam M.A. Al Suqami: 2.4561
 Khalid Almihdhar, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 2.4561
 Khalid Almihdhar, Suri Hanim Mohamad: 2.4341
 Khalid Almihdhar, Ahmad Yani: 2.4341
 Ayman Mohammed Rabie aL- Zawahiri, Anas al-Liby: 2.4335
 Mohammad Omar, Richard Reid: 2.4319
 Mohammed Atta, Haydar Abu Doha: 2.4203
 Muhammad Atef, Tariq Anwar: 2.4
 Muhammad Atef, Sheikh Mir Hamza: 2.4
 Muhammad Atef, Ahmad Said Khadr: 2.4
 Muhammad Atef, Osama Rushdi: 2.4
 Muhammad Atef, Sayed Agami Mohalal M: 2.4
 Muhammad Atef, Mohammed Jamal Khalifa: 2.4
 Muhammad Atef, Fazlul Rehman Khalil: 2.4
 Mohammad Omar, Rahmatullah Hashimi: 2.3991
 Mohammad Omar, Noor Mohammad Saqib: 2.3991
 Mohammad Omar, Abdul Rehman Zahid: 2.3991
 Muhammad Atef, Mohammed Saddiq Odeh: 2.3987
 Hani Hanjour, Haydar Abu Doha: 2.3986
 Muhammad Atef, Refaei Ahmed Taha: 2.3668
 Mohammed Atta, Ramzi Yousef: 2.3479
 Waleed M. Alshehri, Ahmed Ibrahim A. Al Haznawi: 2.3331
 Mohammad Omar, Abu Sabaya: 2.3154
 Mohammad Omar, Hector Janjalani: 2.3154
 Mohammed Atta, Fawaz Yahya Al-Rabeei: 2.3063
 Mohammed Atta, Sameer Mohammed Ahmed al-Hada: 2.3063
 Mohammed Atta, Mustafa Abdulkader Aabed al-Ansari: 2.3063
 Hani Hanjour, Marwan al-Barghuthi: 2.2879
 Mohammad Omar, Abdurajak Janjalani: 2.2855
 Khalid Almihdhar, Hamza Alghamdi: 2.2801
 Mohammed Atta, Abu Qatada: 2.2775
 Khalid Almihdhar, Wali Khan Amin Shah: 2.2712
 Khalid Almihdhar, Ahmed Alghamdi: 2.2652
 Ayman Mohammed Rabie aL- Zawahiri, Ramzi Yousef: 2.2375
 Mohammed Atta, Ahmed Alnami: 2.2363
 Mohammad Omar, Khadafy Janjalani: 2.2341
 Zayn-al-Abidin Abu-Zubaydah, Hani Hanjour: 2.2248
 Zacarias Moussaoui, Isma'il Shalabi: 2.222
 Zacarias Moussaoui, Tha'ir Mansour: 2.222
 Nawaf Alhazmi, Sejahratul Dursina: 2.222
 Hani Hanjour, Ahmed Ibrahim A. Al Haznawi: 2.2157
 Zacarias Moussaoui, Khalid al Fawwaz: 2.2103
 Muhammad Atef, Fathur Rohman al-Ghozi: 2.2071
 Zacarias Moussaoui, John Walker Lindh: 2.2063
 Muhammad Atef, Khalid Shaikh Mohammed: 2.2036
 Zacarias Moussaoui, Abdul Hai Mutmaen: 2.2008
 Zacarias Moussaoui, Abu Jaafar: 2.2008
 Muhammad Atef, Abu Muaz el-Masry: 2.1885
 Muhammad Atef, Abu Khalid el-Masry: 2.1885
 Zacarias Moussaoui, Ramzi Binalshibh: 2.185
 Ayman Mohammed Rabie aL- Zawahiri, Mohammed Jamal Khalifa: 2.182
 Zacarias Moussaoui, Haydar Abu Doha: 2.1666

Mohamed Rashed Daoud Owhali, Mamdouh Mahmud Salim: 2.16
 Richard Reid, Ahmad Shah Masud: 2.1502
 Zacarias Moussaoui, Muhammad Abu Dhess: 2.1435
 Muhammad Atef, Khalil al-Dik: 2.1406
 Zacarias Moussaoui, Ahmad Fadik al Khalalilah: 2.1359
 Khalid Almihdhar, Ahmed Ibrahim A. Al Haznawi: 2.1333
 Zacarias Moussaoui, Nizar Trabelsi: 2.1226
 Zacarias Moussaoui, Sami Essid Ben Khemais: 2.1226
 Ayman Mohammed Rabie al- Zawahiri, Abdullah Yusuf: 2.1105
 Mohammed Saddiq Odeh, Mamdouh Mahmud Salim: 2.0981
 Muhammad Atef, Abu Qatada: 2.0926
 Muhammad Atef, Abu Khalid: 2.087
 Ayman Mohammed Rabie al- Zawahiri, Abdullah Yusuf Azzam: 2.0814
 Zacarias Moussaoui, Yasir al-Sirri: 2.0707
 Nawaf Alhazmi, Saeed Alghamdi: 2.0657
 Marwan Al-Shehhi, Majed Moqed: 2.059
 Nawaf Alhazmi, Wail M. Alshehri: 2.0559
 Nawaf Alhazmi, Waleed M. Alshehri: 2.0556
 Mohammed Atta, Lotfi Raissi: 2.0548
 Muhammad Atef, Haydar Abu Doha: 2.0427
 Zacarias Moussaoui, Abu Bakar Bashir: 2.0324
 Zayn-al-Abidin Abu-Zubaydah, Abu-Hamzah al-Masri: 2.0246
 Zayn-al-Abidin Abu-Zubaydah, Ahmad Shah Masud: 2.0136
 Zacarias Moussaoui, Muhammad Bensakhria: 2.0031
 Abdulaziz Alomari, Ahmed Alnami: 2.0002
 Muhammad Bensakhria, Tarek Maaroufi: 2.0002
 Zayn-al-Abidin Abu-Zubaydah, Sulaiman Abu Ghaith: 2.0001
 Wail M. Alshehri, Saeed Alghamdi: 2.0001
 Majed Moqed, Saeed Alghamdi: 2.0001
 Muhammad Atef, Muhammad Salah: 2

B3.2: Pairs of people names with $rs \geq 0.25$

Zacarias Moussaoui, Hani Hanjour: 0.6952
 Mohammed Atta, Salem Alhazmi: 0.5891
 Muhammad Omar, Richard Reid: 0.5888
 Mohammed Atta, Wail M. Alshehri: 0.5869
 Mohammed Atta, Yazid Sufaat: 0.582
 Mohammed Atta, Nizar Ben Mohammed Nawar: 0.5722
 Mohammed Atta, Ramzi Yousef: 0.5668
 Mohammed Atta, Faisal Al Salmi: 0.5603
 Mohammed Atta, Ahmed Ibrahim A. Al Haznawi: 0.5546
 Mohammed Atta, Ameer Bukhari: 0.5514
 Zacarias Moussaoui, Ahmad Shah Masud: 0.5487
 Mohammed Atta, Saeed Alghamdi: 0.5481
 Mohammed Atta, Marwan al-Barghuthi: 0.5239
 Mohammed Atta, Satam M.A. Al Suqami: 0.5239
 Mohammed Atta, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 0.5239
 Mohammed Atta, Mohand Alshehri: 0.5239
 Mohammed Atta, Khalid al-Shanqiti: 0.5071
 Mohammed Atta, Munir al-Mutasaddiq: 0.5071
 Mohammed Atta, Djamal Beghal: 0.5029

Mohammed Atta, Abu Zubair: 0.4975
Mohammed Atta, Ramadan Shalah: 0.4916
Richard Reid, Ayman Mohammed Rabie aL- Zawahiri: 0.4898
Mohammed Atta, Zacariah Essabar: 0.4855
Mohammed Atta, Mamdouh Mahmud Salim: 0.478
Mohammed Atta, Abu Shala: 0.4776
Mohammed Atta, Gushuf: 0.4776
Mohammed Atta, Abu Zaynab: 0.4776
Mohammed Atta, Abu Khalid: 0.4774
Mohammed Atta, John Walker Lindh: 0.4746
Zacarias Moussaoui, Lotfi Raissi: 0.4744
Mohammed Atta, Haydar Abu Doha: 0.4743
Mohammed Atta, Mohammed al Massari: 0.4674
Mohammed Atta, Raed Hijazi: 0.4673
Mohammed Atta, Khalid al Fawwaz: 0.4669
Zacarias Moussaoui, Fathur Rohman al-Ghozi: 0.4658
Mohammed Atta, Kamel Daoudi: 0.4657
Mohammed Atta, Abu Qatada: 0.463
Mohammed Atta, Abu al-Ilyas: 0.4614
Mohammad Omar, Muhammad Atef: 0.4549
Mohammed Atta, Mohamed Setmariyan Nasar: 0.4453
Mohammed Atta, Abdalrahman Alarnaot Abu-Aljer: 0.4453
Mohammed Atta, Kamal Hadid Cha'r: 0.4452
Richard Reid, Ramzi Yousef: 0.4425
Mohammad Omar, Zayn-al-Abidin Abu-Zubaydah: 0.4423
Richard Reid, Ahmad Shah Masud: 0.4323
Zayn-al-Abidin Abu-Zubaydah, Hani Hanjour: 0.4271
Mohammed Atta, Abdul Rehman Safani: 0.4247
Mohammed Atta, Moataz Al Hallak: 0.4247
Zacarias Moussaoui, Sejahtratul Dursina: 0.4226
Zayn-al-Abidin Abu-Zubaydah, Ahmad Shah Masud: 0.4068
Mohammed Atta, Fawaz Yahya Al-Rabeei: 0.4031
Mohammed Atta, Sameer Mohammed Ahmed al-Hada: 0.4031
Mohammed Atta, Mustafa Abdulkader Aabed al-Ansari: 0.4031
Zacarias Moussaoui, Ahmad Yani: 0.3901
Zacarias Moussaoui, Suri Hanim Mohamad: 0.3901
Mohammed Atta, Omar Abd al-Rahman: 0.386
Mohammad Omar, Ayman Mohammed Rabie aL- Zawahiri: 0.3733
Ayman Mohammed Rabie aL- Zawahiri, Ramzi Yousef: 0.3665
Mohammad Omar, Yousaf Mirza: 0.362
Zayn-al-Abidin Abu-Zubaydah, Anas al-Liby: 0.3555
Muhammad Atef, Jamal Ahmed al-Fadal: 0.3549
Mohammad Omar, Abdurajak Janjalani: 0.3544
Ahmad Shah Masud, Mullah Mohammad Omar: 0.3467
Mohammed Atta, Sheikh Omar Abd al-Rahman: 0.3446
Mohammed Atta, Refaei Ahmed Taha: 0.3434
Zacarias Moussaoui, Albader Alhazmi: 0.3418
Zacarias Moussaoui, Ramzi Binalshibh: 0.3417
Zacarias Moussaoui, Haydar Abu Doha: 0.3393
Zacarias Moussaoui, John Walker Lindh: 0.3362
Richard Reid, Riduan Isamuddin: 0.3359
Zacarias Moussaoui, Abdul Hakim Murad: 0.3337

Mohammad Omar, Pervez Musharraf: 0.3317
 Mohammad Omar, Abu Sabaya: 0.3308
 Mohammad Omar, Hector Janjalani: 0.3308
 Mohammad Omar, Khadafy Janjalani: 0.3304
 Mohammad Omar, Rahmatullah Hashimi: 0.3295
 Mohammad Omar, Noor Mohammad Saqib: 0.3295
 Mohammad Omar, Abdul Rehman Zahid: 0.3295
 Mohammed Atta, Abu-Hamzah al-Masri: 0.3293
 Zacarias Moussaoui, Khalid al Fawwaz: 0.3275
 Zacarias Moussaoui, Raed Hijazi: 0.3274
 Zacarias Moussaoui, Mohammed al Massari: 0.3272
 Zacarias Moussaoui, Ahmed Alghamdi: 0.3266
 Mohammed Atta, Muhammad Bensakhria: 0.3252
 Mohammed Atta, Sami Essid Ben Khemais: 0.3104
 Zacarias Moussaoui, Muhammad Bensakhria: 0.308
 Mohammed Atta, Tarek Maaroufi: 0.2942
 Zayn-al-Abidin Abu-Zubaydah, Mohammed bin Laden: 0.2929
 Zacarias Moussaoui, Ahmad Fadik al Khalalilah: 0.2918
 Zacarias Moussaoui, Abu Jaafar: 0.291
 Zacarias Moussaoui, Abdul Hai Mutmaen: 0.291
 Zacarias Moussaoui, Nizar Trabelsi: 0.2902
 Zacarias Moussaoui, Sami Essid Ben Khemais: 0.2902
 Zacarias Moussaoui, Victor Bout: 0.2849
 Zacarias Moussaoui, Muhammad Abu Dhess: 0.2846
 Zacarias Moussaoui, Tha'ir Mansour: 0.2844
 Zacarias Moussaoui, Isma'il Shalabi: 0.2844
 Zacarias Moussaoui, Yasir al-Sirri: 0.2837
 Zayn-al-Abidin Abu-Zubaydah, Rifa'i Taha Musa: 0.2832
 Muhammad Atef, Fathur Rohman al-Ghozi: 0.2828
 Zacarias Moussaoui, Jose Padilla: 0.2817
 Muhammad Atef, Yasir al-Sirri: 0.2742
 Muhammad Atef, Mohammed Saddiq Odeh: 0.2735
 Richard Reid, Saif Al-Adel: 0.2693
 Ayman Mohammed Rabie al- Zawahiri, Anas al-Liby: 0.2664
 Zayn-al-Abidin Abu-Zubaydah, Mohammed Saddiq Odeh: 0.2651
 Mohammed Atta, Lased Ben Henin: 0.2646
 Hani Hanjour, Haydar Abu Doha: 0.2637
 Muhammad Atef, Abu Qatada: 0.2619
 Richard Reid, Mullah Mohammad Omar: 0.2602
 Zayn-al-Abidin Abu-Zubaydah, Sulaiman Abu Ghaith: 0.2586
 Richard Reid, Haydar Abu Doha: 0.2578
 Zayn-al-Abidin Abu-Zubaydah, Abu-Hamzah al-Masri: 0.2539
 Zacarias Moussaoui, Jamal Udeen: 0.2531
 Zacarias Moussaoui, Munir Ali: 0.2531
 Hani Hanjour, Waleed M. Alshehri: 0.2527

B3.3: Pairs of people names with $b \geq 2$

Ali Salem Kahlah al-Marr, Abdallah al-Shafi: 7.6734
 Ali Salem Kahlah al-Marr, Sa'id Amin: 7.6734
 Mohammed al Massari, Hamza Alghamdi: 5.7615
 Khalid al-Shanqiti, Mouhamedou Ould Slehi: 5.6049

Munir al-Mutasaddiq, Mouhamedou Ould Slehi: 5.6049
 Muhammad Salah, Tharwat Shihatah: 5.5015
 Satam M.A. Al Suqami, Saeed Alghamdi: 5.3513
 Abu Khalid el-Masry, Abu Shala: 5.1229
 Abu Khalid el-Masry, Gushuf: 5.1229
 Abu Khalid el-Masry, Abu Zaynab: 5.1229
 Abu Muaz el-Masry, Abu Zaynab: 5.1229
 Abu Muaz el-Masry, Gushuf: 5.1229
 Abu Muaz el-Masry, Abu Shala: 5.1229
 Gushuf, Abu Muaz el-Masry: 4.8377
 Gushuf, Abu Khalid el-Masry: 4.8377
 Abu Shala, Abu Muaz el-Masry: 4.8377
 Abu Zaynab, Abu Muaz el-Masry: 4.8377
 Abu Shala, Abu Khalid el-Masry: 4.8377
 Abu Zaynab, Abu Khalid el-Masry: 4.8377
 Mohammed al Massari, Hiram Torres: 4.8012
 Mohammed al Massari, Abu Malik: 4.8012
 Ali Salem Kahlah al-Marr, Salah Hajir: 4.6043
 Abu Zubair, Said Bahaji: 4.5168
 Hamza bin Ladin, Ahmed bin Laden: 4.4968
 Richard Reid, Yazid Sufaat: 4.4727
 Abdul Rehman Safani, Shamim Sarwar: 4.2032
 Muhammad Salah, Sayed Agami Mohalal M: 4.1262
 Muhammad Salah, Ahmad Said Khadr: 4.1262
 Mohammed Atta, Salem Alhazmi: 4.1179
 Mohammed al Massari, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 4.1155
 Mohammed al Massari, Wadih El-Hage: 4.1155
 Mohammed al Massari, Mohand Alshehri: 4.1155
 Zacarias Moussaoui, Sejahtatul Dursina: 4.0879
 Raed Hijazi, Mohamed Bayazid: 3.9772
 Saeed Alghamdi, Satam M.A. Al Suqami: 3.9607
 Abdelhalim Remadna, Lased Ben Henin: 3.8883
 Abdelhalim Remadna, Yacine Aknouche: 3.8883
 Satam M.A. Al Suqami, Mohand Alshehri: 3.8225
 Satam M.A. Al Suqami, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 3.8225
 Hamza Alghamdi, Mohammed al Massari: 3.7846
 Wail M. Alshehri, Mohand Alshehri: 3.703
 Wail M. Alshehri, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 3.703
 Sami Essid Ben Khemais, Bouraoui El-Ouaer: 3.6993
 Sami Essid Ben Khemais, Abdelsattar Dahmane: 3.6993
 Sami Essid Ben Khemais, Mohamed Sliti: 3.6993
 Mohammed Atta, Wail M. Alshehri: 3.69
 Mohammed Atta, Nizar Ben Mohammed Nawar: 3.6731
 Samir Kishk, Essoussi Laaroussi: 3.6659
 Samir Kishk, Moktar Farid-Bouchoucha: 3.6659
 Samir Kishk, Mehdi Khammoun: 3.6659
 Bouraoui El-Ouaer, Sami Essid Ben Khemais: 3.6643
 Abdelsattar Dahmane, Sami Essid Ben Khemais: 3.6643
 Mohamed Sliti, Sami Essid Ben Khemais: 3.6643
 Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Wail M. Alshehri: 3.6122
 Mohand Alshehri, Wail M. Alshehri: 3.6122
 Mohammed al Massari, Mohamed Bayazid: 3.601

Mohammed Atta, Ameer Bukhari: 3.581
 Richard Reid, Khalid Almihdhar: 3.5705
 Zacarias Moussaoui, Ahmad Yani: 3.5676
 Zacarias Moussaoui, Suri Hanim Mohamad: 3.5676
 Mohammed Atta, Saeed Alghamdi: 3.5078
 Abu Sabaya, Redendo Dellosa: 3.5015
 Hector Janjalani, Tyron Santos: 3.5015
 Abu Sabaya, Pio de Vera: 3.5015
 Hector Janjalani, Yunus Moklis: 3.5015
 Hector Janjalani, Angelo Trinidad: 3.5015
 Abu Sabaya, Abd al-Rahim al-Nashiri: 3.5015
 Abu Sabaya, Abu Basir al-Yamani: 3.5015
 Abu Sabaya, Angelo Trinidad: 3.5015
 Hector Janjalani, Redendo Dellosa: 3.5015
 Hector Janjalani, Hassan Hattab: 3.5015
 Abu Sabaya, Yunus Moklis: 3.5015
 Hector Janjalani, Abd al-Rahim al-Nashiri: 3.5015
 Hector Janjalani, Abu Basir al-Yamani: 3.5015
 Abu Sabaya, Tyron Santos: 3.5015
 Hector Janjalani, Pio de Vera: 3.5015
 Hector Janjalani, Marvelo Egil: 3.5015
 Abu Sabaya, Marvelo Egil: 3.5015
 Abu Sabaya, Abu Hamzu al-Masri: 3.5015
 Abu Sabaya, Hafiz Mohammed Saeed: 3.5015
 Abu Sabaya, Alan Borloagdatan: 3.5015
 Abu Sabaya, Farooq Kashmiri: 3.5015
 Hector Janjalani, Hafiz Mohammed Saeed: 3.5015
 Hector Janjalani, Alan Borloagdatan: 3.5015
 Hector Janjalani, Abu Hamzu al-Masri: 3.5015
 Abu Sabaya, Hassan Hattab: 3.5015
 Hector Janjalani, Farooq Kashmiri: 3.5015
 Mohammed Atta, Mouhamedou Ould Slehi: 3.4925
 Abdul Hai Mutmaen, Jerome Courtailler: 3.4802
 Abdul Hai Mutmaen, Abdel Ghani Rabia: 3.4802
 Victor Bout, Ibrahim Bah: 3.4675
 Victor Bout, Abdullah Mohammed: 3.4675
 Victor Bout, Ahmed Ghailani: 3.4675
 Abu Zubair, Ramzi Binalshibh: 3.4664
 Ramzi Binalshibh, Mouhamedou Ould Slehi: 3.444
 Raed Hijazi, Hamza Alghamdi: 3.4095
 Moktar Farid-Bouchoucha, Samir Kishk: 3.3914
 Mehdi Khammoun, Samir Kishk: 3.3914
 Essoussi Laaroussi, Samir Kishk: 3.3914
 Richard Reid, Nawaf Alhazmi: 3.3842
 Yacine Aknouche, Abdelhalim Remadna: 3.379
 Mohammed Atta, Satam M.A. Al Suqami: 3.3426
 Mohammed Atta, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 3.3426
 Mohammed Atta, Mohand Alshehri: 3.3426
 Mohammed Atta, Marwan al-Barghuthi: 3.3426
 Sheikh Mir Hamza, Ahmad Al-Gamen: 3.3327
 Fazlul Rehman Khalil, Ahmad Al-Gamen: 3.3327
 Muhammad Salah, Rifa'i Taha Musa: 3.301

Zacariah Essabar, Nizar Ben Mohammed Nawar: 3.2594
 Said Bahaji, Christian Manfred G.: 3.2173
 Mohammed al Massari, Saeed Alghamdi: 3.201
 Ahmed bin Laden, Hamza bin Ladin: 3.1981
 Hector Janjalani, Ahma Aluan: 3.1834
 Abu Sabaya, Ahma Aluan: 3.1834
 Ahmad Al-Gamen, Fazlul Rehman Khalil: 3.1682
 Ahmad Al-Gamen, Sheikh Mir Hamza: 3.1682
 Abdallah al-Shafi, Ali Salem Kahlah al-Marr: 3.1674
 Sa'id Amin, Ali Salem Kahlah al-Marr: 3.1674
 Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Satam M.A. Al Suqami: 3.0959
 Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Waleed M. Alshehri: 3.0959
 Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Mohammed al Massari: 3.0959
 Mohand Alshehri, Mohammed al Massari: 3.0959
 Mohand Alshehri, Waleed M. Alshehri: 3.0959
 Mohand Alshehri, Satam M.A. Al Suqami: 3.0959
 Mohammed Atta, Ahmed Ibrahim A. Al Haznawi: 3.055
 Abdul Hai Mutmaen, Tarek Maaroufi: 3.0451
 Mohammed Atta, Munir al-Mutasaddiq: 3.0434
 Mohammed Atta, Khalid al-Shanqiti: 3.0434
 Richard Reid, Sejahratul Dursina: 3.0163
 Abu al-Ilyas, Mamoun Darkazanli: 3.0154
 Muhammad Bensakhria, Tarek Chaarabi: 3.0006
 Muhammad Bensakhria, Mohamed Aouadi: 3.0006
 Satam M.A. Al Suqami, Hamza Alghamdi: 2.9731
 Abu Jaafar, Lased Ben Henin: 2.9499
 Zacariah Essabar, Mouhamedou Ould Slehi: 2.944
 Abu Zubair, Benjamin Ahmed Mohammed: 2.9234
 Hector Janjalani, Ustadz Nur Mohammed Umog: 2.9181
 Abu Sabaya, Maulana Masood Azhar: 2.9181
 Hector Janjalani, Junior Jikiron: 2.9181
 Hector Janjalani, Maulana Masood Azhar: 2.9181
 Abu Sabaya, Junior Jikiron: 2.9181
 Abu Sabaya, Ustadz Nur Mohammed Umog: 2.9181
 Abdelhalim Remadna, Mehdi Khammoun: 2.9163
 Abdelhalim Remadna, Moktar Farid-Bouchoucha: 2.9163
 Abdelhalim Remadna, Essoussi Laaroussi: 2.9163
 Mohammed al Massari, Ahmed Alnami: 2.8809
 Mohammed Atta, Faisal Al Salmi: 2.8641
 Mohammed Atta, Ramadan Shalah: 2.8129
 Zacarias Moussaoui, Hani Hanjour: 2.7964
 Khalid Shaikh Mohammed, Hamza bin Ladin: 2.7858
 Wail M. Alshehri, Hamza Alghamdi: 2.7772
 Mohammad Omar, Yousaf Mirza: 2.7646
 Said Bahaji, Nizar Ben Mohammed Nawar: 2.7576
 Samir Kishk, Yacine Aknouche: 2.7495
 Abdelsattar Dahmane, Mehdi Khammoun: 2.7481
 Abdelsattar Dahmane, Mohamed Aouadi: 2.7481
 Bouraoui El-Ouaer, Tarek Chaarabi: 2.7481
 Mohamed Sliti, Mehdi Khammoun: 2.7481
 Mohamed Sliti, Tarek Chaarabi: 2.7481
 Mohamed Sliti, Moktar Farid-Bouchoucha: 2.7481

Abdelsattar Dahmane, Tarek Chaarabi: 2.7481
 Bouraoui El-Ouaer, Essoussi Laaroussi: 2.7481
 Bouraoui El-Ouaer, Moktar Farid-Bouchoucha: 2.7481
 Bouraoui El-Ouaer, Mohamed Aouadi: 2.7481
 Mohamed Sliti, Mohamed Aouadi: 2.7481
 Abdelsattar Dahmane, Essoussi Laaroussi: 2.7481
 Abdelsattar Dahmane, Moktar Farid-Bouchoucha: 2.7481
 Mohamed Sliti, Essoussi Laaroussi: 2.7481
 Bouraoui El-Ouaer, Mehdi Khammoun: 2.7481
 Mohammed Atta, Zacariah Essabar: 2.7314
 Richard Reid, Suri Hanim Mohamad: 2.721
 Richard Reid, Ahmad Yani: 2.721
 Abdul Hai Mutmaen, Amine Mezbar: 2.7068
 Hamza Alghamdi, Raed Hijazi: 2.7036
 Marwan al-Barghuthi, Majed Moqed: 2.7009
 Mohammad Omar, Abdul Majid Sulaymankhil: 2.6932
 Mohammed Atta, Abu Zubair: 2.6801
 Satam M.A. Al Suqami, Ahmed Alghamdi: 2.6758
 Satam M.A. Al Suqami, Ahmed Ibrahim A. Al Haznawi: 2.6757
 Muhammad Atef, Yasir al-Sirri: 2.6583
 Raed Hijazi, Mohand Alshehri: 2.6518
 Raed Hijazi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 2.6518
 Mohammed Atta, Gushuf: 2.6317
 Mohammed Atta, Abu Shala: 2.6317
 Mohammed Atta, Abu Zaynab: 2.6317
 Mohammed Atta, Nabil Sayadi: 2.6317
 Mohammed Atta, Nabil Nanakli Kosaibati: 2.6317
 Mohammed Atta, Abdul Fatath Zammar: 2.6317
 Mohammed Atta, Mohamad Bahaih: 2.6317
 Mohammed al Massari, Majed Moqed: 2.619
 Mohammed al Massari, John Walker Lindh: 2.6189
 Abu Zubair, Christian Manfred G.: 2.6151
 Zacarias Moussaoui, Majed Moqed: 2.605
 Mohammed Atta, Muhammad Sa'id Ali Hasan: 2.5982
 Mohammed Atta, Al Rauf Bin Al Habib Bin Yousef Al-Jiddi: 2.5982
 Mohammed Atta, Faker Boussora: 2.5982
 Mohammed Atta, Khalid Ibn Muhammad Al-Juhani: 2.5982
 Ayman Mohammed Rabie alL- Zawahiri, Osama Rushdi: 2.5946
 Lased Ben Henin, Abdelhalim Remadna: 2.594
 Richard Reid, Abu Bakar Bashir: 2.5939
 Saeed Alghamdi, Amer Kamfar: 2.5832
 Fathur Rohman al-Ghozi, Mohd Agus Ahmad Selani.: 2.5768
 Fathur Rohman al-Ghozi, Faizal Khan Gulam Sarwar: 2.5768
 Abu Khalid el-Masry, Mamoun Darkazanli: 2.5615
 Abu Muaz el-Masry, Mamoun Darkazanli: 2.5615
 Mohammad Omar, Muhammed Ali Mukhtar: 2.5605
 Mohammad Omar, Suleiman Asad: 2.5605
 Ali Salem Kahlah al-Marr, Imad Mugniyah: 2.558
 Muhammad Abu Dhess, Sayed Agami Mohalal M: 2.5437
 Essoussi Laaroussi, Abdelhalim Remadna: 2.5436
 Mehdi Khammoun, Abdelhalim Remadna: 2.5436
 Moktar Farid-Bouchoucha, Abdelhalim Remadna: 2.5436

Mehdi Khammoun, Mohamed Sliti: 2.5434
 Mehdi Khammoun, Abdelsattar Dahmane: 2.5434
 Mehdi Khammoun, Tarek Chaarabi: 2.5434
 Moktar Farid-Bouchoucha, Abdelsattar Dahmane: 2.5434
 Moktar Farid-Bouchoucha, Mohamed Aouadi: 2.5434
 Moktar Farid-Bouchoucha, Tarek Chaarabi: 2.5434
 Essoussi Laaroussi, Abdelsattar Dahmane: 2.5434
 Essoussi Laaroussi, Tarek Chaarabi: 2.5434
 Essoussi Laaroussi, Mohamed Aouadi: 2.5434
 Moktar Farid-Bouchoucha, Bouraoui El-Ouaer: 2.5434
 Essoussi Laaroussi, Mohamed Sliti: 2.5434
 Moktar Farid-Bouchoucha, Mohamed Sliti: 2.5434
 Essoussi Laaroussi, Bouraoui El-Ouaer: 2.5434
 Mehdi Khammoun, Mohamed Aouadi: 2.5434
 Mehdi Khammoun, Bouraoui El-Ouaer: 2.5434
 Wadih Hage, L'Houssaine Kherchtou: 2.5432
 Wadih Hage, Ali Mohammad: 2.5432
 Mohammed Atta, Yazid Sufaat: 2.5366
 Yacine Aknouche, Samir Kishk: 2.5343
 Zayn-al-Abidin Abu-Zubaydah, Anas al-Liby: 2.5217
 Mohammed Atta, Mohammed al Massari: 2.5144
 Riduan Isamuddin, Mohamad Khalim bin Jaffar: 2.511
 Satam M.A. Al Suqami, Amer Kamfar: 2.5087
 Abdullah Yusuf Azzam, Ahmad Al-Gamen: 2.5052
 Richard Reid, Kamel Daoudi: 2.5019
 Abu Sabaya, Omar Ibn al Khattab: 2.5012
 Hector Janjalani, Omar Ibn al Khattab: 2.5012
 Muhammad Bensakhria, Bouraoui El-Ouaer: 2.5005
 Muhammad Bensakhria, Abdelsattar Dahmane: 2.5005
 Muhammad Bensakhria, Mohamed Sliti: 2.5005
 John Walker Lindh, Mohammed al Massari: 2.4992
 Said Bahaji, Mouhamedou Ould Slehi: 2.4908
 Richard Reid, Riduan Isamuddin: 2.4786
 Wail M. Alshehri, Ahmed Alghamdi: 2.4687
 Sami Essid Ben Khemais, Jerome Courtailler: 2.4665
 Sami Essid Ben Khemais, Abdel Ghani Rabia: 2.4665
 Zacarias Moussaoui, Omar Bakri Mohammed: 2.4586
 Ahmed Alghamdi, Wail M. Alshehri: 2.4507
 Mohammed Atta, Abu Khalid: 2.4502
 Mohammed Atta, Abu al-Ilyas: 2.4502
 Abdullah Yusuf, Ahmad Al-Gamen: 2.448
 Abu Zubair, Nizar Ben Mohammed Nawar: 2.4436
 Abdul Hai Mutmaen, Essoussi Laaroussi: 2.4359
 Abdul Hai Mutmaen, Mehdi Khammoun: 2.4359
 Abdul Hai Mutmaen, Moktar Farid-Bouchoucha: 2.4359
 Abdul Hai Mutmaen, Mohamed Aouadi: 2.4359
 Abdul Hai Mutmaen, Tarek Chaarabi: 2.4359
 Zayn-al-Abidin Abu-Zubaydah, Kamel Daoudi: 2.4227
 Abu Shala, Abdul Fatath Zammar: 2.4185
 Abu Shala, Mohamad Bahaih: 2.4185
 Abu Shala, Nabil Nanakli Kosaibati: 2.4185
 Abu Shala, Nabil Sayadi: 2.4185

Abu Zaynab, Mohamad Bahaih: 2.4185
 Abu Zaynab, Nabil Nanakli Kosaibati: 2.4185
 Abu Zaynab, Abdul Fatath Zammar: 2.4185
 Abu Zaynab, Nabil Sayadi: 2.4185
 Gushuf, Mohamad Bahaih: 2.4185
 Gushuf, Abdul Fatath Zammar: 2.4185
 Gushuf, Nabil Nanakli Kosaibati: 2.4185
 Gushuf, Nabil Sayadi: 2.4185
 Fayeze Rashid Ahmed Hassan Al Qadi Banihammad, Raed Hijazi: 2.4081
 Mohand Alshehri, Raed Hijazi: 2.4081
 Waleed M. Alshehri, Fayeze Rashid Ahmed Hassan Al Qadi Banihammad: 2.4025
 Waleed M. Alshehri, Mohand Alshehri: 2.4025
 Mohammed al Massari, Amar Chidek: 2.4008
 Mohammed al Massari, Jean-Marc Granvisir: 2.4008
 Mohammed al Massari, Yasser Esam Hamdi: 2.4007
 Ramadan Shalah, Amer Kamfar: 2.3929
 Tha'ir Mansour, Sayed Agami Mohalal M: 2.3892
 Isma'il Shalabi, Sayed Agami Mohalal M: 2.3892
 Raed Hijazi, Yasser Esam Hamdi: 2.3864
 Zacarias Moussaoui, Mohammed al Massari: 2.3853
 Zacarias Moussaoui, Amar Chidek: 2.3853
 Zacarias Moussaoui, Jean-Marc Granvisir: 2.3853
 Mohammad Omar, Rahmatullah Hashimi: 2.3836
 Mohammad Omar, Noor Mohammad Saqib: 2.3836
 Mohammad Omar, Abdul Rehman Zahid: 2.3836
 Zacarias Moussaoui, Ahmed Alnami: 2.3835
 Ahmad Al-Gamen, Abdullah Yusuf Azzam: 2.3764
 Ahmad Al-Gamen, Rifa'i Taha Musa: 2.3764
 Yasir al-Sirri, Abu Jaafar: 2.374
 Abu Zubair, Mamoun Darkazanli: 2.3658
 Hamza Alghamdi, Wail M. Alshehri: 2.3656
 Zacarias Moussaoui, Albader Alhazmi: 2.3638
 Muhammad Atef, Sayyid Qutb: 2.3635
 Muhammad Atef, Tharwat Shihatah: 2.3635
 Abu Jaafar, Essoussi Laaroussi: 2.3599
 Abu Jaafar, Mehdi Khammoun: 2.3599
 Abu Jaafar, Yasir al-Sirri: 2.3599
 Abu Jaafar, Moktar Farid-Bouchoucha: 2.3599
 Muhammad Salah, Hafiz Mohammed Saeed: 2.358
 Muhammad Salah, Hassan Hattab: 2.358
 Muhammad Salah, Farooq Kashmiri: 2.358
 Muhammad Salah, Abu Hamzu al-Masri: 2.358
 Muhammad Salah, Abu Basir al-Yamani: 2.358
 Muhammad Salah, Abd al-Rahim al-Nashiri: 2.358
 Muhammad Salah, Ahmed bin Laden: 2.358
 Muhammad Salah, Ahmad Fadik al Khalalilah: 2.3579
 Muhammad Salah, Wadih El-Hage: 2.3579
 Muhammad Salah, Sayyid Qutb: 2.3578
 Bashir-ud-Din Mahmood, Abdul Majid Sulaymankhil: 2.3549
 Mohammed Atta, Raed Hijazi: 2.3482
 Said Bahaji, Abu Zubair: 2.3397
 Saeed Alghamdi, Adnan Bukhari: 2.3392

Satam M.A. Al Suqami, Adnan Bukhari: 2.3337
 Abu Zubair, Mouhamedou Ould Slehi: 2.3291
 Sayyid Qutb, Tharwat Shihatah: 2.3197
 Marwan al-Barghuthi, Ahmed Alnami: 2.3151
 Victor Bout, Abu Jaafar: 2.312
 Ramadan Shalah, Adnan Bukhari: 2.3064
 Salem Alhazmi, Ahmed Alnami: 2.3063
 Ali Salem Kahlah al-Marr, Ahmed Yassin: 2.3025
 Zacarias Moussaoui, Fathur Rohman al-Ghozi: 2.2997
 Mohammed Atta, Mohamed Setmariam Nasar: 2.2922
 Mohammed Atta, Abdalrahman Alarnaot Abu-Aljer: 2.2922
 Mohammed Atta, Abu Abdulrahman: 2.2922
 Mohammed Atta, Reswan Abdul Ulsalam: 2.2922
 Mohammed Atta, Hamed Abderrahman Ahmed: 2.2922
 Mohammed Atta, Abu Khalid el-Masry: 2.2921
 Mohammed Atta, Abu Muaz el-Masry: 2.2921
 John Walker Lindh, Ahmad Said Khadr: 2.2911
 Zacarias Moussaoui, Saeed Alghamdi: 2.2863
 Zacariah Essabar, Khalid al-Shanqiti: 2.2815
 Zacariah Essabar, Munir al-Mutasaddiq: 2.2815
 Muhammad Atef, Ahmed bin Laden: 2.2792
 Muhammad Atef, Hamza bin Ladin: 2.2792
 Kamel Daoudi, Hamza Alghamdi: 2.2764
 Zacarias Moussaoui, Abdul Hakim Murad: 2.2683
 Sheikh Omar Abd al-Rahman, Mohammed Abdel-Rahman: 2.264
 Mohammed Atta, Abu Bakar Bashir: 2.2627
 Amer Kamfar, Wail M. Alshehri: 2.2579
 Zacarias Moussaoui, Ziad Samir Jarrar: 2.2556
 Hamza bin Ladin, Khalid Shaikh Mohammed: 2.2484
 Richard Reid, Hani Hanjour: 2.2448
 Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Amer Kamfar: 2.242
 Mohand Alshehri, Amer Kamfar: 2.242
 Muhammad Atef, L'Houssaine Kherchtou: 2.2387
 Mohammad Omar, Abu Sabaya: 2.2325
 Mohammad Omar, Hector Janjalani: 2.2325
 Satam M.A. Al Suqami, Salem Alhazmi: 2.2298
 Satam M.A. Al Suqami, Abdulaziz Alomari: 2.2298
 Abu Zubair, Muhammad Galeb Kalaje: 2.2246
 Wail M. Alshehri, Abdulaziz Alomari: 2.2216
 Abdalrahman Alarnaot Abu-Aljer, Muhammad Galeb Kalaje: 2.2201
 Mohamed Setmariam Nasar, Muhammad Galeb Kalaje: 2.2201
 Sami Essid Ben Khemais, Samir Kishk: 2.2197
 Mohammed al Massari, Wail M. Alshehri: 2.2161
 Mohammed al Massari, Ahmad Said Khadr: 2.2161
 Mohammed al Massari, Ahmed Ibrahim A. Al Haznawi: 2.2161
 Mohammed Atta, Riduan Isamuddin: 2.2157
 Moataz Al Hallak, Mohamed Rashed Daoud Owhali: 2.2136
 Ahmed Alghamdi, Waleed M. Alshehri: 2.2055
 Ahmed Alghamdi, Satam M.A. Al Suqami: 2.2055
 Ahmed Alghamdi, Hiram Torres: 2.2054
 Ahmed Alghamdi, Abu Malik: 2.2054
 Muhammad Salah, Muhammad Abu Dhess: 2.2008

Muhammad Salah, Abu Malik: 2.2008
 Muhammad Salah, Hiram Torres: 2.2008
 Saeed Alghamdi, Mohammed al Massari: 2.2005
 Osama Rushdi, Tharwat Shihatah: 2.1998
 Samir Kishk, Tarek Maaroufi: 2.1996
 Samir Kishk, Sami Essid Ben Khemais: 2.1996
 Bouraoui El-Ouaer, Lased Ben Henin: 2.1987
 Abdelsattar Dahmane, Lased Ben Henin: 2.1987
 Mohamed Sliti, Lased Ben Henin: 2.1987
 Zacarias Moussaoui, Raed Hijazi: 2.1982
 Zacarias Moussaoui, Satam M.A. Al Suqami: 2.1966
 Zacarias Moussaoui, Mohand Alshehri: 2.1966
 Zacarias Moussaoui, Abdulaziz Alomari: 2.1966
 Zacarias Moussaoui, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 2.1966
 Abu Muaz el-Masry, Muhammad Galeb Kalaje: 2.1955
 Abu Khalid el-Masry, Muhammad Galeb Kalaje: 2.1955
 Ahmad Al-Gamen, Abdullah Yusuf: 2.1936
 Zayn-al-Abidin Abu-Zubaydah, Rifa'i Taha Musa: 2.1932
 Abu Sabaya, Ayman Mohammed Rabie al-Zawahiri: 2.1889
 Abu Sabaya, Abd Al-Rahim: 2.1889
 Hector Janjalani, Abd Al-Rahim: 2.1889
 Hector Janjalani, Ayman Mohammed Rabie al-Zawahiri: 2.1889
 Ramadan Shalah, Ziad Samir Jarrah: 2.1879
 Nizar Trabelsi, Tarek Maaroufi: 2.185
 Zacarias Moussaoui, Faiz Abu Bakar Bafana: 2.1803
 Abu Zubair, Muhammad Galeb Kalaje Zouaydi: 2.1759
 Moataz Al Hallak, Khalfan Khamis Mohamed: 2.1697
 Raed Hijazi, Saeed Alghamdi: 2.1697
 Raed Hijazi, Ahmad Said Khadr: 2.1695
 Ahmed Ibrahim A. Al Haznawi, Satam M.A. Al Suqami: 2.1657
 Zayn-al-Abidin Abu-Zubaydah, Mokhtar Haouari: 2.1619
 Marwan al-Barghuthi, Saeed Alghamdi: 2.1608
 Abu Zubair, Imad Eddin Barakat: 2.1601
 Lotfi Raissi, Nawaf Alhazmi: 2.1596
 Mohammed Atta, Kamal Hadid Cha'r: 2.1534
 Hani Hanjour, Saeed Alghamdi: 2.1504
 Moataz Al Hallak, Mohammed Saddiq Odeh: 2.1485
 Ahmad Fadik al Khalalilah, Tharwat Shihatah: 2.1444
 Khalid Almihdhar, Sejahratul Dursina: 2.144
 Zayn-al-Abidin Abu-Zubaydah, Mohammed bin Laden: 2.1315
 Mohammed Atta, Abd Al-Rahim: 2.1306
 Abdurajak Janjalani, Yunus Moklis: 2.1304
 Abdurajak Janjalani, Tyron Santos: 2.1304
 Abdurajak Janjalani, Redendo Dellosa: 2.1304
 Abdurajak Janjalani, Pio de Vera: 2.1304
 Abdurajak Janjalani, Marvelo Egil: 2.1304
 Abdurajak Janjalani, Angelo Trinidad: 2.1304
 Abdurajak Janjalani, Alan Borloagdatan: 2.1304
 Mohamed Setmariam Nasar, Muhammad Galeb Kalaje Zouaydi: 2.1276
 Abdalrahman Alarnaot Abu-Aljer, Mamoun Darkazanli: 2.1276
 Mohamed Setmariam Nasar, Mamoun Darkazanli: 2.1276
 Abdalrahman Alarnaot Abu-Aljer, Muhammad Galeb Kalaje Zouaydi: 2.1276

Muhammad Atef, Tariq Anwar: 2.1272
 Muhammad Atef, Sayed Agami Mohalal M: 2.1272
 Muhammad Atef, Mohammed Jamal Khalifa: 2.1272
 Muhammad Atef, Ahmad Said Khadr: 2.1272
 Muhammad Atef, Fazlul Rehman Khalil: 2.1272
 Muhammad Atef, Sheikh Mir Hamza: 2.1272
 Muhammad Atef, Osama Rushdi: 2.1272
 Ramadan Shalah, Salem Alhazmi: 2.1271
 Ramadan Shalah, Majed Moqed: 2.1271
 Ramadan Shalah, Waleed M. Alshehri: 2.127
 Hani Hanjour, Yazid Sufaat: 2.1267
 Ayman Mohammed Rabie al- Zawahiri, Mohammed Jamal Khalifa: 2.1228
 Mohammed Atta, Benjamin Ahmed Mohammed: 2.1204
 Richard Reid, Majed Moqed: 2.1188
 Nizar Ben Mohammed Nawar, Zacariah Essabar: 2.1161
 Nizar Ben Mohammed Nawar, Said Bahaji: 2.1161
 Zacarias Moussaoui, Wail M. Alshehri: 2.1139
 Hamza Alghamdi, Satam M.A. Al Suqami: 2.1026
 Hamza Alghamdi, Waleed M. Alshehri: 2.1026
 Khalid al-Shanqiti, Said Bahaji: 2.1019
 Munir al-Mutasaddiq, Zacariah Essabar: 2.1019
 Munir al-Mutasaddiq, Said Bahaji: 2.1019
 Khalid al-Shanqiti, Zacariah Essabar: 2.1019
 Zacarias Moussaoui, Osama Rushdi: 2.0986
 Zacarias Moussaoui, Wali Khan Amin Shah: 2.0984
 Mohammad Omar, Khadafy Janjalani: 2.0968
 Salem Alhazmi, Saeed Alghamdi: 2.0967
 Ali Salem Kahlah al-Marr, Omar Bakri Mohammed: 2.0933
 Ali Salem Kahlah al-Marr, Mohamad Hammoud: 2.0929
 Ali Salem Kahlah al-Marr, Saif Al-Adel: 2.0929
 Ali Salem Kahlah al-Marr, Abbas Harake: 2.0929
 Ameer Bukhari, Ahmed Alnami: 2.0922
 Mohammed Atta, Sejahtatul Dursina: 2.089
 Zacarias Moussaoui, Faisal Al Salmi: 2.0882
 Kamel Daoudi, Abu Malik: 2.0861
 Kamel Daoudi, Hiram Torres: 2.0861
 Abu Muaz el-Masry, Muhammad Galeb Kalaje Zouaydi: 2.0839
 Abu Khalid el-Masry, Muhammad Galeb Kalaje Zouaydi: 2.0839
 Ramadan Shalah, Marwan Al-Shehhi: 2.0838
 Mohammed Atta, Kamel Daoudi: 2.0741
 Mohammed Atta, Hiram Torres: 2.0739
 Mohammed Atta, Abu Malik: 2.0739
 Fayez Rashid Ahmed Hassan Al Qadi Banihammad, Adnan Bukhari: 2.0706
 Mohand Alshehri, Adnan Bukhari: 2.0706
 Ameer Bukhari, Abdulaziz Alomari: 2.0669
 Muhammad Salah, Maulana Masood Azhar: 2.0633
 Muhammad Salah, Sa'd Usama bin Laden: 2.0633
 Muhammad Salah, Mohammed Jamal Khalifa: 2.0632
 Muhammad Salah, Osama Rushdi: 2.0632
 Muhammad Salah, Sheikh Mir Hamza: 2.0632
 Muhammad Salah, Fazlul Rehman Khalil: 2.0632
 Mohammed al Massari, Waleed M. Alshehri: 2.0577

Mohammed al Massari, Satam M.A. Al Suqami: 2.0577
 Abu Muaz el-Masry, Imad Eddin Barakat: 2.0492
 Abu Khalid el-Masry, Imad Eddin Barakat: 2.0492
 Lotfi Raissi, Khalid Almihdhar: 2.0476
 Zacarias Moussaoui, Lotfi Raissi: 2.0475
 Abu Zubair, Munir al-Mutasaddiq: 2.0418
 Abu Zubair, Khalid al-Shanqiti: 2.0418
 Mohammed Atta, Malek Seif: 2.0412
 Zacarias Moussaoui, Ahmed Alghamdi: 2.0385
 Zacarias Moussaoui, Waleed M. Alshehri: 2.037
 Zacarias Moussaoui, Hamza Alghamdi: 2.037
 L'Houssaine Kherchtou, Wadih Hage: 2.0369
 Mohammad Omar, Abdurajak Janjalani: 2.0362
 Essoussi Laaroussi, Abu Jaafar: 2.0349
 Essoussi Laaroussi, Abdul Hai Mutmaen: 2.0349
 Mehdi Khammoun, Abdul Hai Mutmaen: 2.0349
 Moktar Farid-Bouchoucha, Abdul Hai Mutmaen: 2.0349
 Mehdi Khammoun, Abu Jaafar: 2.0349
 Moktar Farid-Bouchoucha, Abu Jaafar: 2.0349
 Mohammed Atta, Mamdouh Mahmud Salim: 2.0303
 Ayman Mohammed Rabie aL- Zawahiri, Anas al-Liby: 2.0303
 Abdul Hai Mutmaen, Lased Ben Henin: 2.0301
 Abdul Hai Mutmaen, Bouraoui El-Ouaer: 2.03
 Abdul Hai Mutmaen, Mohamed Sliti: 2.03
 Abdul Hai Mutmaen, Abdelsattar Dahmane: 2.03
 Muhammad Atef, Abu Muaz el-Masry: 2.0258
 Muhammad Atef, Abu Khalid el-Masry: 2.0258
 Mohammed Atta, Abdul Hakim Murad: 2.0257
 Marwan al-Barghuthi, Satam M.A. Al Suqami: 2.0257
 Marwan al-Barghuthi, Mohand Alshehri: 2.0257
 Marwan al-Barghuthi, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 2.0257
 Victor Bout, Abdelhalim Remadna: 2.023
 Zacarias Moussaoui, Mohamad Khalim bin Jaffar: 2.023
 Ramadan Shalah, Mohammed Atta: 2.0219
 Hani Hanjour, Satam M.A. Al Suqami: 2.0213
 Hani Hanjour, Mohand Alshehri: 2.0213
 Hani Hanjour, Fayez Rashid Ahmed Hassan Al Qadi Banihammad: 2.0213
 Richard Reid, Omar Bakri Mohammed: 2.0201
 Sami Essid Ben Khemais, Amine Mezbar: 2.0181
 Zacarias Moussaoui, Ahmed Yassin: 2.0164
 Mohammed Atta, Wadih El-Hage: 2.015
 Zacarias Moussaoui, Sameer Mohammed Ahmed al-Hada: 2.0131
 Zacarias Moussaoui, Fawaz Yahya Al-Rabeei: 2.0131
 Zacarias Moussaoui, Mustafa Abdulkader Aabed al-Ansari: 2.0131
 Khalid Almihdhar, Saeed Alghamdi: 2.008
 Ahmed Alghamdi, Wadih El-Hage: 2.005
 Muhammad Bensakhria, Abdel Ghani Rabia: 2.0006
 Muhammad Bensakhria, Jerome Courtailler: 2.0006
 Hani Hanjour, Amer Kamfar: 2.0003
 Mohammed Atta, Moataz Al Hallak: 2
 Mohammed Atta, Abdul Rehman Safani: 2

B4: EGP

B4.1: Pairs of events with $s \geq 2$

USS Cole Bombing, U.S. Embassy Bombing--Tanzania: 3.2314
U.S. Embassy Bombing--Kenya, USS Cole Bombing: 3.2314
Luxor Massacre, World Trade Center 9/11 Attack: 2.0612
USS Cole Bombing, Luxor Massacre: 2.0151
World Trade Center Bombing, World Trade Center 9/11 Attack: 2.0151

B4.2: Pairs of events with $rs \geq 0.25$

USS Cole Bombing, U.S. Embassy Bombing--Tanzania: 0.4713
U.S. Embassy Bombing--Kenya, USS Cole Bombing: 0.4713
Philippine Embassy Bombing, U.S. Embassy Bombing--Tanzania: 0.2917
U.S. Embassy Bombing--Kenya, Philippine Embassy Bombing: 0.2917
Philippine Embassy Bombing, Pentagon Attack: 0.2917
Philippine Embassy Bombing, Pennsylvania Flight: 0.2917
U.S. Embassy Bombing--Kenya, US Embassy bombing--Paris: 0.2655
U.S. Embassy Bombing--Kenya, La Griba Synagogue Explosion: 0.2655
La Griba Synagogue Explosion, U.S. Embassy Bombing--Tanzania: 0.2655
U.S. Embassy Bombing--Kenya, Khobar Towers Bombing: 0.2655
Pennsylvania Flight, US Embassy Bombing...New Delhi: 0.2655
US Embassy Bombing...New Delhi, Pentagon Attack: 0.2655
US Embassy bombing--Paris, Pentagon Attack: 0.2655
U.S. Embassy Bombing--Tanzania, US Embassy Bombing...New Delhi: 0.2655
U.S. Embassy Bombing--Tanzania, US Embassy bombing--Paris: 0.2655
U.S. Embassy Bombing--Kenya, US Embassy Bombing...New Delhi: 0.2655
Pennsylvania Flight, US Embassy bombing--Paris: 0.2655
Pennsylvania Flight, Khobar Towers Bombing: 0.2655
Khobar Towers Bombing, Pentagon Attack: 0.2655
Khobar Towers Bombing, U.S. Embassy Bombing--Tanzania: 0.2655
La Griba Synagogue Explosion, Pentagon Attack: 0.2655
La Griba Synagogue Explosion, Pennsylvania Flight: 0.2655

B4.3: Pairs of events with $b \geq 2$

None.

B5: GEP

B5.1: Pairs of group names with $s \geq 2$

None.

B5.2: Pairs of group names with $rs \geq 0.25$

None.

B5.3: Pairs of group names with $b \geq 2$

None.

B6: EPP

B6.1: Pairs of events with $s \geq 2$

None

B6.2: Pairs of events with $rs \geq 0.25$

None

B6.3: Pairs of events with $b \geq 2$

None

B7: PEP

B7.1: Pairs of people names with $s \geq 2$

None.

B7.2: Pairs of people names with $rs \geq 0.25$

Ayman Mohammed Rabie al-Zawahiri, Khalid al Fawwaz: 0.3584
Khalid Almhidhar, Osama Bin Laden: 0.3188

B7.3: Pairs of people names with $b \geq 2$

None.

B8: GPP

B8.1: Pairs of group names with $s \geq 2$

al-Qaeda, al Jihad: 2.573
al-Qaeda, Al-Gama'a al-Islamiyya: 2.2586

B8.2: Pairs of group names with $rs \geq 0.25$

al-Qaeda, al Jihad: 0.6114
al-Qaeda, Al-Gama'a al-Islamiyya: 0.5572

B8.3: Pairs of group names with $b \geq 2$

Al-Gama'a al-Islamiyya, al Jihad: 4.7708
al Jihad, Al-Gama'a al-Islamiyya: 4.5476
al Jihad, Libyan Islamic Fighting Group: 3.2998
Al-Gama'a al-Islamiyya, Libyan Islamic Fighting Group: 2.3297

B9: PGP

B9.1: Pairs of people names with $s \geq 2$

Zayn-al-Abidin Abu-Zubaydah, Saif Al-Adel: 2.2501
Abdullah Ahmed Abdullah, Saif Al-Adel: 2.2501
Saif Al-Adel, Sulaiman Abu Ghaith: 2.2501
Saif Al-Adel, Muhammad Atef: 2.1908
Saif Al-Adel, Anas al-Liby: 2.1908
Rifa'i Taha Musa, Tharwat Shihatah: 2.0612
Mohammed Atta, Rifa'i Taha Musa: 2.0305
Anas al-Liby, Mohammed Atta: 2.0151
Muhammad Atef, Tharwat Shihatah: 2.0101
Abdullah Ahmed Abdullah, Mohammed Atta: 2.0101
Zayn-al-Abidin Abu-Zubaydah, Mohammed Atta: 2.0101
Mohammed Atta, Sulaiman Abu Ghaith: 2.0101

B9.2: Pairs of people names with $rs \geq 0.25$

Saif Al-Adel, Anas al-Liby: 0.3539
Saif Al-Adel, Muhammad Atef: 0.3539
Anas al-Liby, Mohammed Atta: 0.328
Zayn-al-Abidin Abu-Zubaydah, Saif Al-Adel: 0.2713
Abdullah Ahmed Abdullah, Saif Al-Adel: 0.2713
Saif Al-Adel, Sulaiman Abu Ghaith: 0.2713

B9.3: Pairs of people names with $b \geq 2$

None.

B10: PRP

B10.1: Pairs of people names with $s \geq 2$

Khalid Almihdhar, Mohammed Atta: 4.801
Khalid Almihdhar, Abdulaziz Alomari: 4.4594
Ayman Mohammed Rabie al-Zawahiri, Imad Mugnyah: 3.2727
Ayman Mohammed Rabie al-Zawahiri, Sulaiman Abu Ghaith: 3.1183
Ayman Mohammed Rabie al-Zawahiri, Fazlul Rehman Khalil: 3.0667
Zayn-al-Abidin Abu-Zubaydah, Imad Mugnyah: 2.9744
Zayn-al-Abidin Abu-Zubaydah, Sulaiman Abu Ghaith: 2.9502
Zayn-al-Abidin Abu-Zubaydah, Fazlul Rehman Khalil: 2.7692
Muhammad Atef, Imad Mugnyah: 2.592
Muhammad Atef, Fazlul Rehman Khalil: 2.5714

Muhammad Atef, Sulaiman Abu Ghaith: 2.5503
 Marwan Al-Shehhi, Zacariah Essabar: 2.393
 Satam M.A. Al Suqami, Raed Hijazi: 2.3712
 Ahmed Alghamdi, Raed Hijazi: 2.3712
 Wail M. Alshehri, Zacarias Moussaoui: 2.3224
 Abdulaziz Alomari, Zacarias Moussaoui: 2.3224
 Zacariah Essabar, Hani Hanjour: 2.3163
 Zacariah Essabar, Majed Moqed: 2.3163
 Salem Alhazmi, Zacariah Essabar: 2.3163
 Nawaf Alhazmi, Zacariah Essabar: 2.3163
 Mohammed Atta, Zacariah Essabar: 2.2469
 Ayman Mohammed Rabie al-Zawahiri, Khalfan Khamis Mohamed: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Peter Kinyanjui: 2.1576
 Ahmad Al-Gamen, Ayman Mohammed Rabie al-Zawahiri: 2.1576
 Mubarak al-Duri, Ayman Mohammed Rabie al-Zawahiri: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Mohamed Rashed Daoud Owhali: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Latif Mansour: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Nizar Trabelsi: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Majid Shimari: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Abu Abdullah Shafae: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Mamdouh Mahmud Salim: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Shaihk Saiid: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Omar Ibn al Khattab: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Khalid al Fawwaz: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Kamel Daoudi: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, John Walker Lindh: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Sheikh Mir Hamza: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Jean-Marc Granvisir: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Mohammed Jamal Khalifa: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Mohammed Saddiq Odeh: 2.1576
 Ayman Mohammed Rabie al-Zawahiri, Wakil Ahmed Muttawakil: 2.1283
 Zayn-al-Abidin Abu-Zubaydah, Yacine Aknouche: 2.1128
 Mohammed Atta, Zacarias Moussaoui: 2.0952
 Saeed Alghamdi, Khalid Almihdhar: 2.0508
 Ahmed Ibrahim A. Al Haznawi, Khalid Almihdhar: 2.0508
 Khalid Almihdhar, Ahmed Alnami: 2.0508
 Khalid Almihdhar, Mohand Alshehri: 2.0508
 Marwan Al-Shehhi, Khalid Almihdhar: 2.0508
 Ahmed Alghamdi, Khalid Almihdhar: 2.0508
 Hamza Alghamdi, Khalid Almihdhar: 2.0508
 Mohammad Omar, Abdul Salam Zaeef: 2.0101
 Anas al-Liby, Wakil Ahmed Muttawakil: 2.0026
 Zayn-al-Abidin Abu-Zubaydah, Wakil Ahmed Muttawakil: 2.0026

B10.2: Pairs of people names with $rs \geq 0.25$

Khalid Almihdhar, Mohammed Atta: 0.7917
 Khalid Almihdhar, Abdulaziz Alomari: 0.7758
 Ayman Mohammed Rabie al-Zawahiri, Fazlul Rehman Khalil: 0.4947
 Ayman Mohammed Rabie al-Zawahiri, Wakil Ahmed Muttawakil: 0.4496
 Muhammad Atef, Fazlul Rehman Khalil: 0.4486
 Ayman Mohammed Rabie al-Zawahiri, Sulaiman Abu Ghaith: 0.4384

Marwan Al-Shehhi, Zacariah Essabar: 0.4273
 Zacariah Essabar, Majed Moqed: 0.4171
 Nawaf Alhazmi, Zacariah Essabar: 0.4171
 Zacariah Essabar, Hani Hanjour: 0.4171
 Salem Alhazmi, Zacariah Essabar: 0.4171
 Mohammed Atta, Zacariah Essabar: 0.4074
 Muhammad Atef, Wakil Ahmed Muttawakil: 0.4035
 Ayman Mohammed Rabie al-Zawahiri, Imad Mugnyah: 0.3989
 Muhammad Atef, Sulaiman Abu Ghaith: 0.3923
 Zayn-al-Abidin Abu-Zubaydah, Wakil Ahmed Muttawakil: 0.3675
 Anas al-Liby, Wakil Ahmed Muttawakil: 0.3675
 Zayn-al-Abidin Abu-Zubaydah, Fazlul Rehman Khalil: 0.367
 Muhammad Atef, Imad Mugnyah: 0.3528
 Yacine Aknouche, Muhammad Atef: 0.3506
 Zayn-al-Abidin Abu-Zubaydah, Sulaiman Abu Ghaith: 0.3414
 Zayn-al-Abidin Abu-Zubaydah, Yacine Aknouche: 0.3399
 Ahmad Mohammad Ali al-Hada, Nawaf Alhazmi: 0.3391
 Ahmad Mohammad Ali al-Hada, Hani Hanjour: 0.3391
 Ahmad Mohammad Ali al-Hada, Majed Moqed: 0.3391
 Ahmad Mohammad Ali al-Hada, Salem Alhazmi: 0.3391
 Ayman Mohammed Rabie al-Zawahiri, Muhammad Galeb Kalaje Zouaydi: 0.3335
 Satam M.A. Al Suqami, Raed Hijazi: 0.3322
 Ahmed Alghamdi, Raed Hijazi: 0.3322
 Khalid Almihdhar, Zacariah Essabar: 0.313
 Ayman Mohammed Rabie al-Zawahiri, Abdul Hai Mutmaen: 0.3108
 Ayman Mohammed Rabie al-Zawahiri, Djamal Beghal: 0.305
 Muhammad Atef, Muhammad Galeb Kalaje Zouaydi: 0.2874
 Sameer Mohammed Ahmed al-Hada, Nawaf Alhazmi: 0.2859
 Sameer Mohammed Ahmed al-Hada, Majed Moqed: 0.2859
 Sameer Mohammed Ahmed al-Hada, Hani Hanjour: 0.2859
 Sameer Mohammed Ahmed al-Hada, Salem Alhazmi: 0.2859
 Zayn-al-Abidin Abu-Zubaydah, Imad Mugnyah: 0.2836
 Ayman Mohammed Rabie al-Zawahiri, Abdul Salam Zaef: 0.2784
 Ayman Mohammed Rabie al-Zawahiri, Sheikh Mir Hamza: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, John Walker Lindh: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Jean-Marc Granvisir: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Shaikh Saïid: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Kamel Daoudi: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Mohammed Jamal Khalifa: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Mohamed Rashed Daoud Owhali: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Khalid al Fawwaz: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Mohammed Saddiq Odeh: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Omar Ibn al Khattab: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Abu Abdullah Shafae: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Latif Mansour: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Majid Shimari: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Mamdouh Mahmud Salim: 0.2771
 Ahmad Al-Gamen, Ayman Mohammed Rabie al-Zawahiri: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Khalfan Khamis Mohamed: 0.2771
 Mubarak al-Duri, Ayman Mohammed Rabie al-Zawahiri: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Nizar Trabelsi: 0.2771
 Ayman Mohammed Rabie al-Zawahiri, Peter Kinyanjui: 0.2771

Abdullah Ahmed Abdullah, Wakil Ahmed Muttawakil: 0.2718
Ayman Mohammed Rabie al-Zawahiri, Eri Ziyad Abu Zaki: 0.2713
Ayman Mohammed Rabie al-Zawahiri, Abu Malik: 0.2713
Ayman Mohammed Rabie al-Zawahiri, Sa'd Usama bin Laden: 0.2713
Ayman Mohammed Rabie al-Zawahiri, Mohammad Omar: 0.2713
Ayman Mohammed Rabie al-Zawahiri, Ahmed Omar Abdel Rahman: 0.2713
Ayman Mohammed Rabie al-Zawahiri, Rafiq Islam: 0.2713
Muhammad Atef, Abdul Hai Mutmaen: 0.2647

B10.3: Pairs of people names with $b \geq 2$

Ayman Mohammed Rabie al-Zawahiri, Imad Mugniyah: 2.896
Zayn-al-Abidin Abu-Zubaydah, Imad Mugniyah: 2.7935
Mamoun Darkazanli, Imad Mugniyah: 2.6483
Ayman Mohammed Rabie al-Zawahiri, Sulaiman Abu Ghaith: 2.4561
Muhammad Atef, Imad Mugniyah: 2.3385
Zayn-al-Abidin Abu-Zubaydah, Sulaiman Abu Ghaith: 2.2918
Khalid Almihdhar, Mohammed Atta: 2.2641
Ahmed Brahim, Imad Mugniyah: 2.1669
Munir al-Mutasaddiq, Imad Mugniyah: 2.1669
Mohammed Haydar Zammar, Imad Mugniyah: 2.1669
Ayman Mohammed Rabie al-Zawahiri, Fazlul Rehman Khalil: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Omar Ibn al Khattab: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Kamel Daoudi: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Mohammed Jamal Khalifa: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Khalid al Fawwaz: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Peter Kinyanjui: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Ahmad Al-Gamen: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Mubarak al-Duri: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Jean-Marc Granvisir: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Latif Mansour: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Khalfan Khamis Mohamed: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Sheikh Mir Hamza: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Mohammed Saddiq Odeh: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Mohamed Rashed Daoud Owhali: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Shaihk Saïid: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Mamdouh Mahmud Salim: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Abu Abdullah Shafae: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Majid Shimari: 2.1237
Ayman Mohammed Rabie al-Zawahiri, Nizar Trabelsi: 2.1237
Ayman Mohammed Rabie al-Zawahiri, John Walker Lindh: 2.1237
Khalid Almihdhar, Abdulaziz Alomari: 2.103
Muhammad Atef, Sulaiman Abu Ghaith: 2.048
Zacarias Moussaoui, Abdulaziz Alomari: 2.0322
Zacarias Moussaoui, Wail M. Alshehri: 2.0322

B11: RPP

B11.1: Pairs of related people names with $s \geq 2$

Osama Bin Laden, Bashir-ud-Din Mahmood: 4.478

Osama Bin Laden, Ayman Mohammed Rabie aL- Zawahiri: 4.1439
 Khalid Almihdhar, Marwan al-Shehhi: 3.9046
 Mohammed Atta, Mustafa Abdulkader Aabed al-Ansari: 3.8499
 Khalid Almihdhar, Ahmed Alghamdi: 3.5916
 Khalid Almihdhar, Hamza Alghamdi: 3.5705
 Khalid Almihdhar, Mohand Alshehri: 3.5705
 Mohammed Atta, Ahmad Mohammad Ali al-Hada: 3.568
 Sameer Mohammed Ahmed al-Hada, Mohammed Atta: 3.568
 Ayman aL- Zawahiri, Abdullah Ahmed Abdullah: 3.408
 Ayman aL- Zawahiri, Sulaiman Abu Ghaith: 3.408
 Osama Bin Laden, Ayman Mohammed Rabie al-Zawahiri: 3.2521
 Osama Bin Laden, Tharwat Shihatah: 3.2521
 Osama Bin Laden, Rifa'i Taha Musa: 3.2521
 Osama Bin Laden, Ali al-Rashidi: 3.2521
 Abdulaziz Alomari, Mustafa Abdulkader Aabed al-Ansari: 3.233
 Osama Bin Laden, Refaei Ahmed Taha: 3.065
 Osama Bin Laden, Sheikh Mir Hamza: 3.065
 Sameer Mohammed Ahmed al-Hada, Abdulaziz Alomari: 2.983
 Abdulaziz Alomari, Ahmad Mohammad Ali al-Hada: 2.983
 Mohammed Atta, Richard Reid: 2.96
 Zacarias Moussaoui, Marwan al-Shehhi: 2.9115
 Ziad Samir Jarrah, Marwan al-Shehhi: 2.6968
 Osama Bin Laden, Haydar Abu Doha: 2.6644
 Zayn-al-Abidin Abu-Zubaydah, Anas al-Liby: 2.5357
 Saeed Alghamdi, Marwan al-Shehhi: 2.5288
 Ahmed Alnami, Marwan al-Shehhi: 2.5288
 Marwan al-Shehhi, Ahmed Ibrahim A. Al Haznawi: 2.5288
 Wail M. Alshehri, Richard Reid: 2.5181
 Zacarias Moussaoui, Ramzi Binalshibh: 2.4783
 Richard Reid, Abdulaziz Alomari: 2.4373
 Saeed Alghamdi, Satam M.A. Al Suqami: 2.2998
 Satam M.A. Al Suqami, Ahmed Ibrahim A. Al Haznawi: 2.2998
 Ahmed Alnami, Satam M.A. Al Suqami: 2.2998
 Waleed M. Alshehri, Ahmed Ibrahim A. Al Haznawi: 2.1263
 Waleed M. Alshehri, Saeed Alghamdi: 2.1263
 Waleed M. Alshehri, Ahmed Alnami: 2.1263
 Osama Bin Laden, Abdul Salam Zaef: 2.1153
 Osama Bin Laden, Noor Mohammad Saqib: 2.1153
 Sameer Mohammed Ahmed al-Hada, Ahmad Mohammad Ali al-Hada: 2.0612
 Osama Bin Laden, Mohammed Atta: 2.0362

B11.2: Pairs of related people names with $rs \geq 0.25$

Osama Bin Laden, Bashir-ud-Din Mahmood: 0.7767
 Osama Bin Laden, Ayman Mohammed Rabie aL- Zawahiri: 0.7587
 Osama Bin Laden, Haydar Abu Doha: 0.6247
 Osama Bin Laden, Mohammed Atta: 0.5089
 Osama Bin Laden, Ali al-Rashidi: 0.457
 Osama Bin Laden, Rifa'i Taha Musa: 0.457
 Osama Bin Laden, Tharwat Shihatah: 0.457
 Osama Bin Laden, Ayman Mohammed Rabie al-Zawahiri: 0.457
 Osama Bin Laden, Sheikh Mir Hamza: 0.4446

Osama Bin Laden, Refaei Ahmed Taha: 0.4446
 Mohammed Atta, Mustafa Abdulkader Aabed al-Ansari: 0.3626
 Sameer Mohammed Ahmed al-Hada, Mohammed Atta: 0.3525
 Mohammed Atta, Ahmad Mohammad Ali al-Hada: 0.3525
 Osama Bin Laden, Noor Mohammad Saqib: 0.3479
 Osama Bin Laden, Abdul Salam Zaef: 0.3479
 Mohammed Atta, Richard Reid: 0.3243
 Osama Bin Laden, Imad Eddin Barakat: 0.3197
 Osama Bin Laden, Mamoun Darkazanli: 0.3197
 Abdulaziz Alomari, Mustafa Abdulkader Aabed al-Ansari: 0.2678
 Mohammed Atta, Ayman aL- Zawahiri: 0.2659
 Sameer Mohammed Ahmed al-Hada, Abdulaziz Alomari: 0.2578
 Abdulaziz Alomari, Ahmad Mohammad Ali al-Hada: 0.2578

B11.3: Pairs of related people names with $b \geq 2$

Ahmad Mohammad Ali al-Hada, Fawaz Yahya Al-Rabeei: 3.9877
 Ghashub al-Abrash al-Ghalyun, Muhammad Galeb Kalaje Zouaydi: 3.7767
 Nabil Nanakli Kosaibati, Muhammad Galeb Kalaje Zouaydi: 3.7767
 Abdul Fatath Zammar, Muhammad Galeb Kalaje Zouaydi: 3.7767
 Mohamad Bahaih, Muhammad Galeb Kalaje Zouaydi: 3.7767
 Nabil Sayadi, Muhammad Galeb Kalaje Zouaydi: 3.7767
 Tharwat Shihatah, Abdul Majid: 3.4583
 Osama Bin Laden, Tharwat Shihatah: 2.9101
 Osama Bin Laden, Rifa'i Taha Musa: 2.9101
 Osama Bin Laden, Ali al-Rashidi: 2.9101
 Osama Bin Laden, Ayman Mohammed Rabie al-Zawahiri: 2.9101
 Refaei Ahmed Taha, Muhammad Atef: 2.8566
 Sheikh Mir Hamza, Muhammad Atef: 2.8566
 Osama Bin Laden, Refaei Ahmed Taha: 2.7427
 Osama Bin Laden, Sheikh Mir Hamza: 2.7427
 Refaei Ahmed Taha, Anas al-Liby: 2.6558
 Sheikh Mir Hamza, Saif Al-Adel: 2.6558
 Sheikh Mir Hamza, Anas al-Liby: 2.6558
 Refaei Ahmed Taha, Saif Al-Adel: 2.6558
 Osama Bin Laden, Bashir-ud-Din Mahmood: 2.6442
 Sheikh Mir Hamza, Sulaiman Abu Ghaith: 2.5643
 Sheikh Mir Hamza, Abdullah Ahmed Abdullah: 2.5643
 Refaei Ahmed Taha, Sulaiman Abu Ghaith: 2.5643
 Refaei Ahmed Taha, Abdullah Ahmed Abdullah: 2.5643
 Osama Bin Laden, Ayman Mohammed Rabie aL- Zawahiri: 2.4469
 Osama Bin Laden, Abdul Majid: 2.4228
 Osama Bin Laden, Mohammed Omar: 2.0883