

CSCI 241: HOMEWORK 2

Each question is worth 25 points. The assignment is due on Feb 4, in class. Show your work.

1. Let $L(x, y)$ denote that x likes y . $K(x, y)$ denotes that x knows y personally. It is possible to like a person without knowing the person personally (you can like a celebrity, for instance). Our variables x and y come from inhabitants of a town. Translate the following sentences into logic formulae:
 - (a) There is a person in town that no one likes even though at least one person knows him.
 - (b) Everybody likes at least one person and knows at least one person.
 - (c) For every person x , there's at least one person that x both knows and likes. How is this different from the previous one?
 - (d) There is a person who likes someone without knowing him/her.
2. Argue by giving an example (for instance, from mathematics) that the following two statements are not the same:
 $\exists x(P(x) \wedge Q(x))$ and $\exists xP(x) \wedge \exists xQ(x)$.
3. Problem 12 from the exercises at the end of Section 1.6 in the book. If you like you can look up the solution to Pr 11 and use that in your answer.
4. Problem 28 from the same section.