

Software Speculation

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Software Speculation

- What is it?
- Why is it important?

Speculation Program

speculation

{ parallel code }

verification

{ sequential code }

endSpeculation(check variable)

Speculation Program

– Fork

```
pid_t childPid = fork();  
If(childPid == 0){  
    //Child code  
}else{  
    //Parent code  
}
```

– Pipes



– Macros

```
#define speculation  
    if(childPid == 0){  
        //code  
    }  
    else{  
        //code  
    }
```

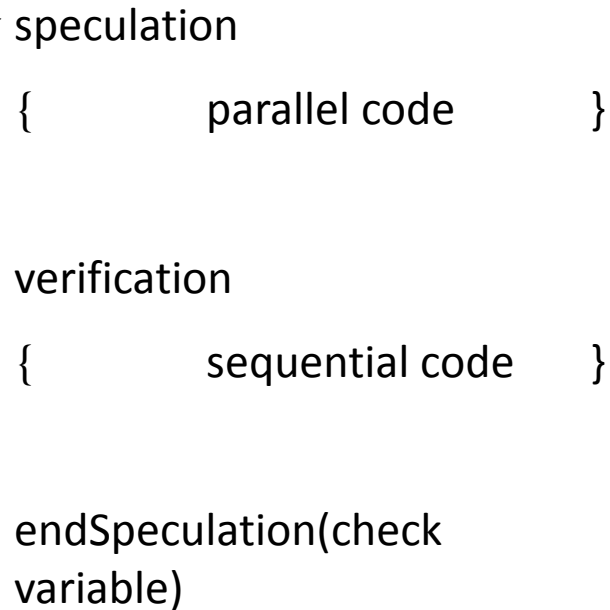
Speculation Program

```
speculation
    for(int i=0;i<10;i++){
        arrTest[i] = parentValue;
    }
verification
    id="child ";
    for(int i=0;i<10;i++){
        arrTest[i] = childValue;
    }
    printf("finished child\n");
endSpeculation(int,arrTest)
while(true){
    printf("In %s \n", id);
    sleep(1);
}
return(0);
```

Speculation Program

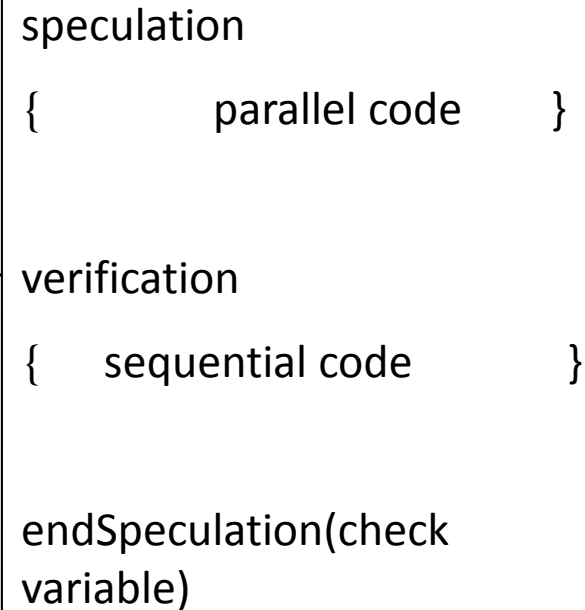
Speculator(Parent)

Verifier (Child)



```
speculation  
{    parallel code    }  
  
verification  
{    sequential code  }  
  
endSpeculation(check  
variable)
```

The diagram shows a code block for the Speculator (Parent) process. It contains three main sections: a speculation block with parallel code, a verification block with sequential code, and an endSpeculation function that takes a check variable as input. An arrow points to the start of the speculation block.



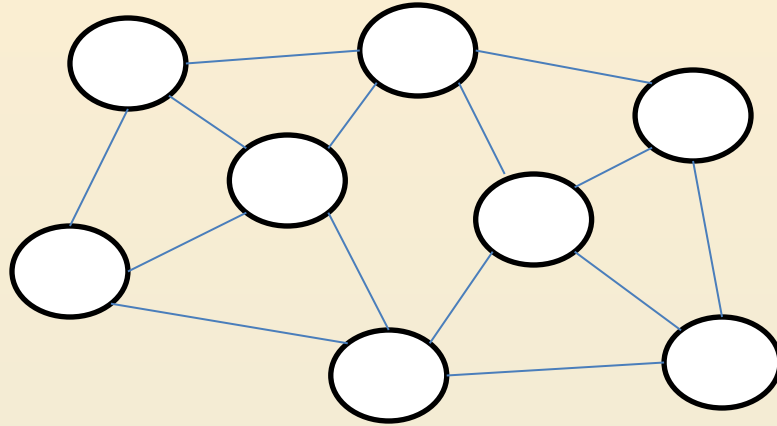
```
speculation  
{    parallel code    }  
  
verification  
{    sequential code  }  
  
endSpeculation(check  
variable)
```

The diagram shows a code block for the Verifier (Child) process. It contains three main sections: a speculation block with parallel code, a verification block with sequential code, and an endSpeculation function that takes a check variable as input. An arrow points to the start of the verification block.

Testing Speculation Program

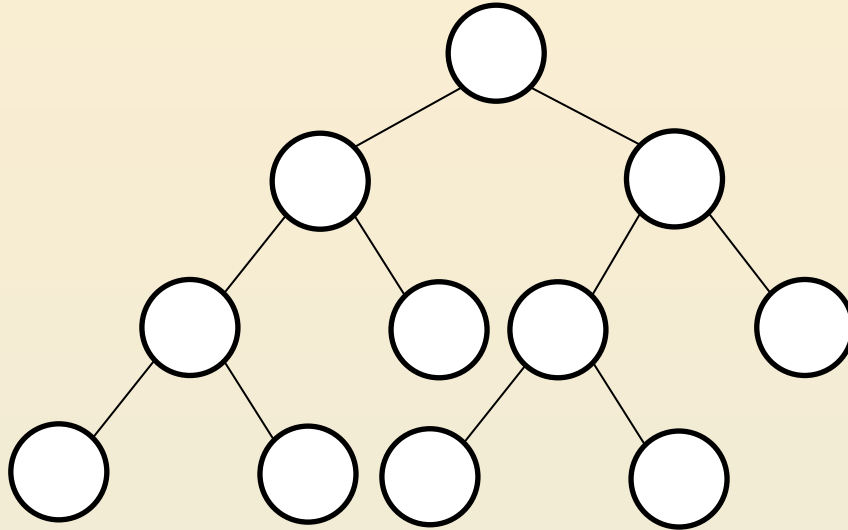
- Two Test Scenarios
 - Scenario 1: Graph Theory Problems
 - Scenario 2: Binary Search Algorithms

Scenario 1



- Test the library for graph theory problem
- Measure no. of times the speculator is killed
- Analyze Effect of graph sizes on the results.

Scenario 2



- Approach

- Chance of Infeasible Value
- Dynamic Calculation Times

- Measuring

- Effects of Chance Values
- The Effects of the Calculation Times