

CSCE 3613 Operating Systems Homework for Honors Students, ver. 3.1

Dining Philosophers Programming Assignment

*****THIS HOMEWORK IS FOR HONORS STUDENTS ONLY*****

40 points

Instructions

- Make sure that your code can be run from the command line as “java DiningPhilosopher 20”, which means that it will run for 20 seconds.
- Name your Java program “DiningPhilosopher.java”.
- You may debug the program on other platforms, but you must compile and run the final program on the machine turing.uark.edu.
- Put your name and UA ID in a comment at the top of your code.
- Create one ZIP file of your assignment consisting of the following and upload it to Blackboard:
 - All source code
 - A readme.txt file that describes your program
 - An output.txt file that is the output of your program

Implement a solution to the Dining Philosophers Problem using the programming language Java and monitors (synchronized methods). It should simulate the five philosophers thinking and eating. Print to the screen when a philosopher is thinking, when they pick up a chopstick with the left or right hand, and when they put down the chopstick with the left or right hand. Put in randomized delays to simulate the amount of thinking time and eating time. Below is an example of the type of output that your program should create.

```
Philosopher 1 Thinking
Philosopher 2 Thinking
Philosopher 3 Thinking
Philosopher 4 Thinking
Philosopher 5 Thinking
Philosopher 2 Picked up left chopstick
Philosopher 2 Picked up right chopstick
Philosopher 4 Picked up left chopstick
Philosopher 2 Put down right chopstick
Philosopher 1 Picked up left chopstick
Philosopher 2 Put down left chopstick
Philosopher 2 Thinking
etc.
```

Your program should take the amount of time to run from the command line in seconds. Make sure to test it several times because there are some solutions that actually are not solutions but can cause deadlock. Make sure that your solution is deadlock free.

Rubric

The program will be graded using the following rubric.

- Program does not compile (-40).
- Program compiles but does not run (-20).

- The program will be run multiple times with varying times. If any create deadlock or errors, (-10).
- Program correctness (-10).
- Minor mistakes (-5).
- If name and ID not in a comment in the program (-1).