**Lab Worksheet**

Please complete all the problems described below

**Question 0**

1. Write a single-threaded java program that counts down from 10 to 1.
2. Write a multi-threaded solution with 2 threads that count down from 10 to 1.
3. Include the sleep method in the thread solutions such that between each count there are 1 second sleep.

**Question 1**

Write a single-threaded java program that tosses a coin 100,000 times and computes the frequency of heads and tails. Print the results on screen.

**Question 2**

Write a program that uses 4 threads that each toss a coin a given number of times (say 25,000 times). The result of each toss is stored in an array. The array is required to be large enough to store the result of each throw and each thread should only write to its own separate array. Once the threads have completed their work then the main program counts the frequency of each throw and prints it on the screen (in terms of tails and heads counts from each thread’s array).

Instead of an array you can store the count of heads or tails in multiple int counters.

**Question 3**

Benchmark and compare the time taken by each solution written in Question 1 and Question 2. Which one works faster?