SENG2200/6220 –Programming Languages & Paradigms
Self-Quiz for Week 9, Semester 1, 2020

True/False Questions.

1. A process is a running program that it has isolated memory address space.
   True.

2. A thread is a section of a running program that it has isolated memory address space assigned by the program/process.
   False. Threads share memory address space, while a process will be allocated isolated memory address space.

   Semaphore supports simple signals to solve the resource sharing problems, and it guarantees that the deadlock and starvation problems will be avoided.
   False. The semaphore does not guarantee the solutions, but it helps.

   By using mutual exclusion, we can solve the bounded buffer problem.
   True.

3. Java synchronized keyword effectively enables the monitors.
   True.

Short-Answer Questions

What does the "counter" mean in the semaphore structure? What does it mean if the counter is initially 0, 1, 2, respectively?
The "counter" indicates the number of available shared resources. If the counter is negative, then it means that some processes/threads are waiting.

0 – There is no resource available that the process/thread has to wait.
1 – There is one resource available that a process/thread will do mutual exclusion.
2 - There are two resources available that a process/thread can freely take one as long as the counter is greater than 0. After that, the process/thread will be blocked.

4. What are the two ways to create a thread in Java?
   1. Thread class. *This approach works if your class does not have a parent class.* E.g.,

      class MyThreadClass extends Thread {…}

   2. Runnable interface. *This approach helps if your class has a parent class while you want to create a thread. E.g.,*

      class MyRunnableClass extends MyParent implements Runnable {…}