Homework 1 – COMP 3500 Karl Sprayberry – kds0049

**1.1. Show a sequence (i.e., trace the sequence of interleavings of statements) such that the statement “x is 10” is printed.**

P1 | P2

x = 10 |

x = x-1; x = 9------🡪x = x-1

x = x+1<---------------x = 8

x = 9 |

if (x != 10) √------🡪x = x+1

🡨----------------------x= 10

|

printf (x) [x = 10] √ Done

**1.2. Show a sequence such that the statement “x is 8” is printed.**

P1 | P2

x = 10 |

x = x-1; x=9------🡪x=x-1 (assembly)

- | Load R0, x [x=9]

| Sub R0 [x=8]

x=x+1(assembly)🡨-----------

Load R1, x[x=9]|

Add R1 [x=10]

Store R1, x[x=10]|

---------------------🡪Store R0,x[x=8] (replaces R1 store into x)

if (x!=10)√ 🡨-----------------

printf(x) [x = 8] √

**2. What is the difference between binary and general semaphores?**

Binary Semaphore – can only have 2 different values

General Semaphore – can have as many different numerical values as the creator wants

**3. What is a monitor?**

A monitor is a synchronization construct that allows threads to have mutual exclusion and the ability to wait (block) for a certain condition to become true.

**4. What operations can be performed on a semaphore?**

A semaphore can perform a Signal and Wait command