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Operating Systems – Lab 5

Professor Mansour

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Lab 5 Questions

1. **Does the value of the counter change from one experiment to the other, or is it constant? If it is constant, what is the value? Explain why if not constant.**

The value of the counter is 0 for the lower region of n. As n increases, however, there is a change in the value of the counter printed out at the end of the program. This value is not constant as n increases; the value of counter changes with each run of the program. This is due to a data race occurring between the main thread and the secondary thread. Both threads are attempting to access the same memory space and write to it at the same time, are are not in sync with each other (such as not using the mutex lock statement). As n increases and each thread’s writes increase, it becomes more and more likely that it will cause unexpected behavior.

1. **Is there a region of n where the behavior is different from the behavior in other regions? Explain why if any.**

As n grows larger and larger, particularly after it reaches 10000 and the two threads are writing to the same memory space more frequently, it becomes more likely that the threads will become out of sync. This is due to the data race mentioned in the answer to the previous question, but also most likely due to CPU scheduling issues. Perhaps the CPU schedules instructions in an unexpected or undesired way which could potentially cause the final counter value to differ from its expected value of 0.