

Lab-7 Report

Group Members:

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Part A:

1.

Case 1:

Done!

Count is 91763

Time taken is 507 microseconds

Case 2:

Done!

Count is 90144

Time taken is 519 microseconds

Case 3:

Done!

Count is 80182

Time taken is 635 microseconds

The average value of count is 87363 and the average time taken is 553.67 microseconds

2.

No, the final value of count doesn't match the value of $N \cdot K$ in any of the cases.

The line that causes this race condition is :

count++; (line number 13 in races-partA.c)

Part B:

1.

Case 1:

Done!

Count is 98327

Time taken is 465 microseconds

Case 2:

Done!

Count is 84838

Time taken is 762 microseconds

Case 3:

Done!

Count is 78939

Time taken is 691 microseconds

The average value of count is 87368 and the average time taken is 639.33 microseconds

2.

No, the final value of count doesn't match the value of $N \cdot K$ in any of the cases. In this case, there would be race conditions in accessing the variable locked as well.

The race conditions are due to the following lines(line numbers 14-17):

```
while(locked); //do nothing; busy wait
locked = 1; //set lock
count++; //increment
locked = 0; //release lock
```

The difference as compared to part A is that there are two variables that are accessed by multiple threads which can give rise to race conditions. Hence there isn't any significant benefit in using this software lock.

Part C:

1.

Case 1:

Done!

Count is 100000

Time taken is 5989 microseconds

Case 2:

Done!

Count is 100000

Time taken is 5034 microseconds

Case 3:

Done!

Count is 100000

Time taken is 6450 microseconds

The average value of count is 100000 and the average time taken is 5824.33 microseconds

2.

Yes, the final value of count matches $N \cdot K$. No race condition occurred because while incrementing the value of count, the lock ensures that only one thread can increment the value of count at a time. The difference as compared to part A is the presence of mutex which is basically a hardware lock.