Programming Assignment-3

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After including all the libraries in the program we open the file “inp-params.txt” and take the input values into n, k, $\lambda 1$, $\lambda 2$.

These variables are defined globally along with the wasting time and max waiting time so that they can used everywhere for analysis.

After taking the inputs we have created n threads and ids and send them to the respective functions. “testing tas”, “testing cas”, “testing cas-bounded”.

For getting instant time, we use the function “func_time” so that the function returns the time in hours mins and seconds.

We make two exponential distributions and pass the value of $\lambda 1$, $\lambda 2$ in the constructor Later this can be used to obtain random numbers t1 and t2 with values that are exponentially distributed with an average of $\lambda 1$, $\lambda 2$ seconds.

Testing TAS function:
For tas we use test and set function in the while using atomic_flag named lock and after we calculate the waiting time and max waiting time.

Testing CAS function:

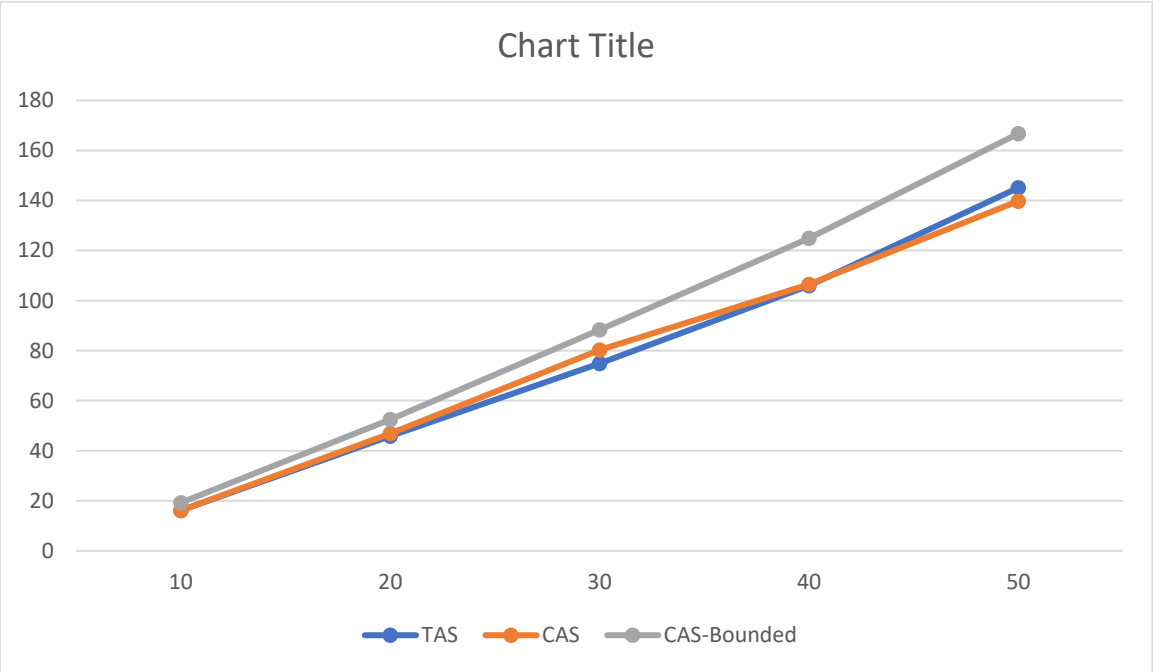
For cas we use atomic named lock and after we calculate the waiting time and max waiting time and at last in the while loop we use lock.compare_exchange_strong(a,b) to decide whether to break the while loop or not.

Testing CAS-Bounded function:

For cas-bounded we use atomic named lock and after we calculate the waiting time and max waiting time and at last in the while loop we use lock.compare_exchange_strong(a,b) to change the keyvalue and use both keyvalue and waitingarray[prevthreadid] whether to break the while loop or not.

OUTPUT Analysis:

Average time vs No of Threads:

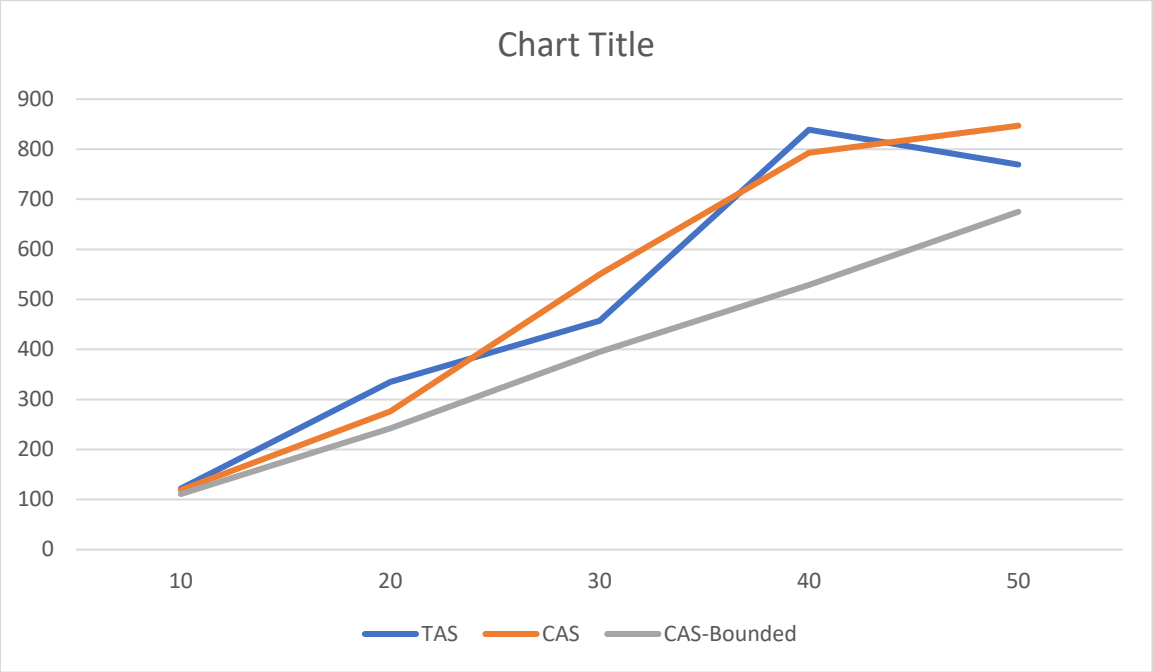


The above curve shows the variation of Avg-time taken in each case while we change the threads.

Analysis:

1. Average waiting time for TAS and CAS is almost the same.
2. For CAS-Bounded the average waiting time is little more than those of other 2.

Worst case waiting time vs No of Threads:



The above curve shows the variation of worst case waiting time taken in each case while we change the threads.

Analysis:

1. Worst- case waiting time is less for CAS-Bounded .
2. The same for TAS and CAS are more than that of CAS-Bounded.

Conclusion:

Considering Avg-waiting time we can see that CAS-Bounded is performing the worst while TAS was performing the best which was almost same as CAS.

Considering worst-case waiting time CAS-bounded performed better than both TAS and CAS.