REPORT

ASSIGNMENT-3 **(ES19BTECH11003)**

This report contains a comparison of the performance of TAS, CAS and Bounded CAS ME algorithms. After running multiple times to compare the performances and displayed the result in the form of a graph.

LOW LEVEL DESIGN OF PROGRAM BRIEFLY

The main for all the 3 programs is same which includes file operations as well as creating and joining of threads and at last calls the print function to generate the output file containing the time details.

testCS

This is also almost same for the 3 programs but the entry sec and exit sec function varies.This function algorithm is already given in assignment .

Entry Sec and Exit_sec For TAS

Entry Sec

This consists of while condition with atomic test and set inbuilt function according to test and set algorithm instructions

Exit_sec

This consists of single statement making lock_stream to clear.

Entry Sec and Exit_sec For CAS

Entry_sec

This consists of a while condition with atomic compare and exchange inbuilt function according to test and set algorithm instructions.

Exit_Sec

This consists of single statement making L(lock)=0

Entry Sec For bounded ME CAS

Entry_SEC

This consists of same algo as mentioned and we use compare and swap function developed from CAS algorithm and we use this in the while condition.

Exit_Sec

This consists of changing waiting array values and while condition by increment of j according to the algorithm of time bounded waiting mutual exclusion of CAS.

Analysis Of Graphs

The input values for which these graphs are3 generated is

N=(10,20,30,40,50)

K=10

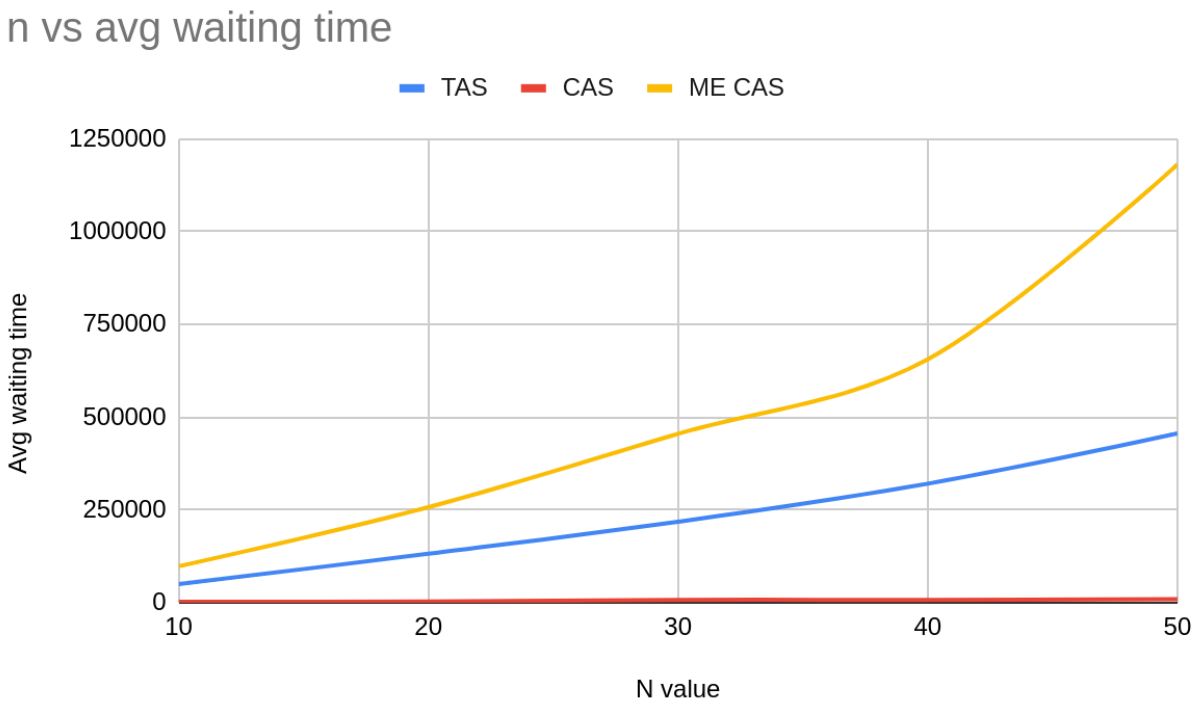
lambda1=5

lambda2=20

Graph-1

N vs Avg Waiting time

Here waiting time is in microseconds



From the above graph we can observe that CAS has very less avg waiting time value when compared with TAS and bounded ME CAS

As no of threads increases the difference is also increasing considerably.

It is evident as Bounded CAS has constraintover number of times a processs enter CS so we can clearly see that many process have to wait in bounded CS.

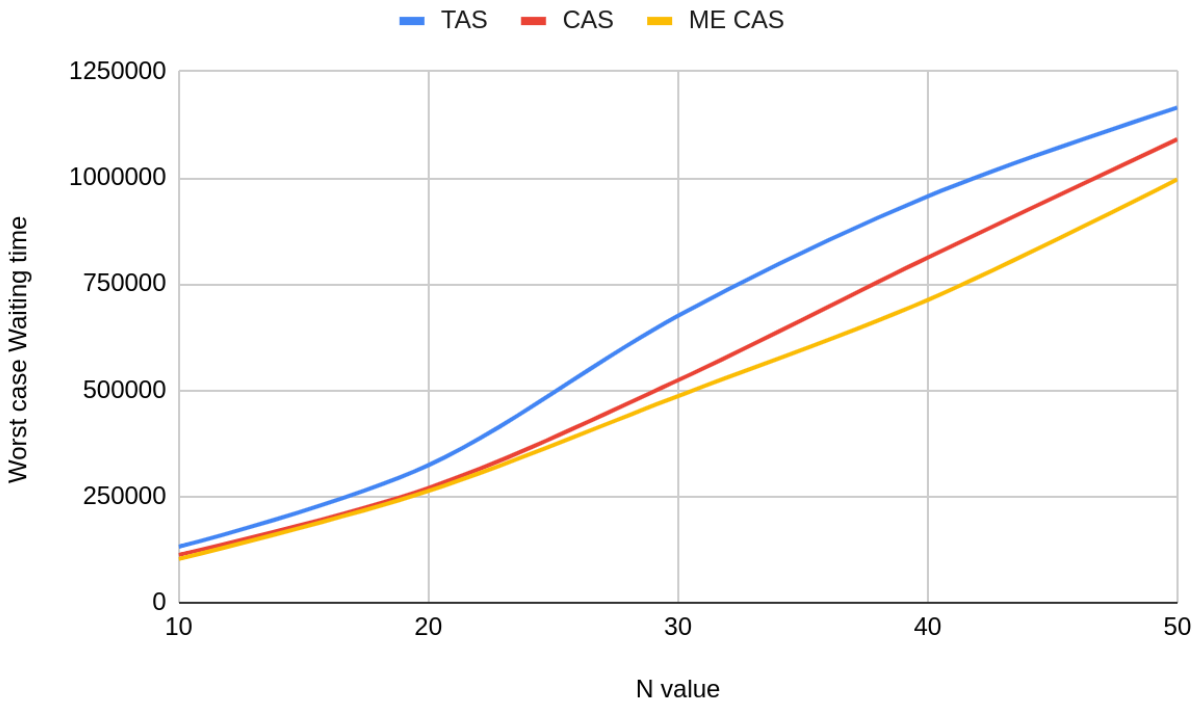
Conclusion

Average waiting time is comparably less when compared with TAS and BOUnded CAS

Graph-2

N vs Worst case waiting time

Here also waiting time is in microseconds.



From the above graph we can see that initially all 3 have roughly same worst case waiting times but as no of threads increases the TAS worst case waiting time increases gradually when compared with the others waiting time and bounded CAS have least worst waiting time as from its algorithm of bounded CAS

The bounded CAS always have less starvation when compared with the other two hence it is understandable that bounded CAS have less worst case waiting time.

In bounded CAS it makes sure that every thread gets into CS when needed.so all threads will have almost equal chance to enter into critical section which is the reason that bounded CAS have less worst case waiting time.

Conclusion

From the above graph and after vobserving algorithms of 3 methods we can understand that bounded CAS algorithm have least worst case waiting time due to less starvation when compared with the other 2 processes.