Assgn1Report-cs23btech11021

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1 Introduction

this is assignment for the understanding of the tas, cas and bounded cas locks.

2 design and file structure

1. the folder contains four sections main folder(in which we are currently in),tests,graphs,tables
2. we can run the source file using makefile
3. the makefile usage is mentioned in the readme

3 tables

3.1 size of input

s No.	x-axis	TAS Avg CS Entry Time	CAS Avg CS Entry Time	Bounded CAS Avg CS Entry Time	TAS Avg CS Exit Time	CAS Avg CS Exit Time	Bounded CAS Avg CS Exit Time	Total Time Taken
1	400	3.40739	0.396711	0.310043	0.416559	0.969837	0.299577	4012.12
2	900	2.7087	0.29409	0.236839	0.314299	0.718716	0.252919	16784.8
3	1600	1.51312	0.274713	0.189072	0.258825	0.47073	0.222193	51189.5
4	2500	1.50215	0.240753	0.187404	0.255127	0.625457	0.228766	123045
5	3600	0.869355	1.00264	0.196846	0.277557	0.503888	0.246646	258985
6	4900	0.810324	0.22866	0.174233	0.233818	0.352592	0.232407	483135
7	6400	0.554206	0.230856	0.164087	0.233041	0.295123	0.225093	850507
8	8100	0.56952	0.261656	0.201948	0.258833	0.322231	0.25541	1.39561e+06
9	10000	0.483573	0.283703	0.21236	0.288529	0.333025	0.27557	2.2206e+06

s No.	x-axis	TAS worst CS Entry Time	CAS worst CS Entry Time	Bounded CAS worst CS Entry Time	TAS worst CS Exit Time	CAS worst CS Exit Time	Bounded CAS worst CS Exit Time	Total Time Taken
1	400	47.0284	1.4755	1.3001	4.5818	0.5867	1.5099	4012.12
2	900	68.4137	1.6547	1.3732	5.8685	1.0505	0.7402	16784.8
3	1600	64.5343	9.5326	1.674	6.1162	0.7581	0.8718	51189.5
4	2500	154.44	2.7216	2.5327	6.0761	1.5126	1.5381	123045
5	3600	72.6662	122.013	4.2841	10.113	71.6668	2.5903	258985
6	4900	105.587	4.7812	3.8853	5.3368	2.1771	7.3082	483135
7	6400	74.072	7.5827	3.904	5.2971	2.4408	2.9638	850507
8	8100	95.1795	7.9468	7.7516	7.13	4.007	4.3417	1.39561e+06
9	10000	80.8339	15.0309	8.5765	6.7384	6.7423	4.1037	2.2206e+06

3.2 taskInc

s No.	x-axis	TAS Avg CS Entry Time	CAS Avg CS Entry Time	Bounded CAS Avg CS Entry Time	TAS Avg CS Exit Time	CAS Avg CS Exit Time	Bounded CAS Avg CS Exit Time	Total Time Taken
1	10	0.38052	0.24085	0.172223	0.236088	0.258461	0.239537	1.39291e+06
2	15	0.928536	0.241316	0.178649	0.317321	0.398667	0.263564	1.40226e+06
3	20	0.522224	0.265035	0.204237	0.260276	0.309185	0.261354	1.40884e+06
4	25	1.12065	0.786049	0.200651	0.263238	0.906504	0.2602	1.41363e+06
5	30	0.990144	0.310795	0.224675	0.28667	0.557362	0.275759	1.4266e+06
6	35	0.778494	0.304395	0.252054	0.307723	0.397978	0.299208	1.43059e+06
7	40	0.939557	0.368388	0.270553	0.334515	0.445527	0.310349	1.43731e+06
8	45	1.0021	0.361254	0.296013	0.359366	0.470802	0.334655	825716
9	50	1.15602	0.353871	0.280172	0.350621	0.508494	0.320491	1.43736e+06

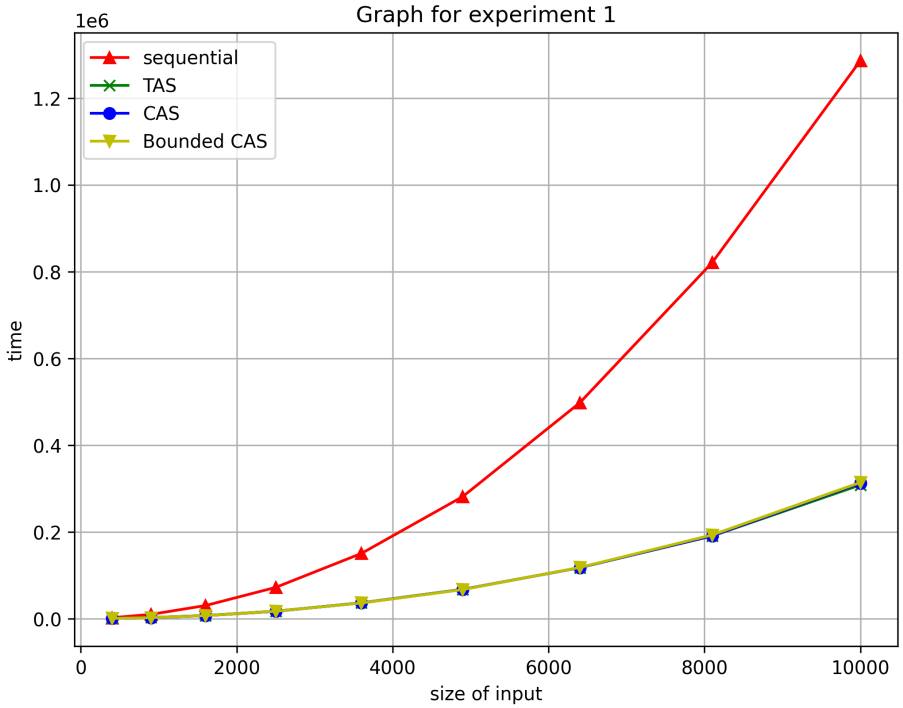
s No.	x-axis	TAS worst CS Entry Time	CAS worst CS Entry Time	Bounded CAS worst CS Entry Time	TAS worst CS Exit Time	CAS worst CS Exit Time	Bounded CAS worst CS Exit Time	Total Time Taken
1	10	81.68	18.5798	12.3682	22.343	8.5472	14.4608	1.39291e+06
2	15	274.964	11.8874	12.1507	139.161	10.7005	46.4832	1.40226e+06
3	20	76.8452	6.6378	8.1571	7.274	5.0436	8.4623	1.40884e+06
4	25	547.868	406.196	5.3219	8.5729	102.53	5.3234	1.41363e+06
5	30	197.204	27.899	6.4733	8.7943	44.3562	2.6944	1.4266e+06
6	35	76.1335	5.2689	12.4583	6.0696	3.4974	3.1945	1.43059e+06
7	40	83.6081	22.9873	5.3215	6.3817	3.1249	2.8584	1.44694e+06
8	45	72.2489	5.7034	6.1779	5.4054	5.1774	4.0445	1.43731e+06
9	50	92.0109	6.1068	5.0937	7.3716	2.6943	2.9452	1.43736e+06

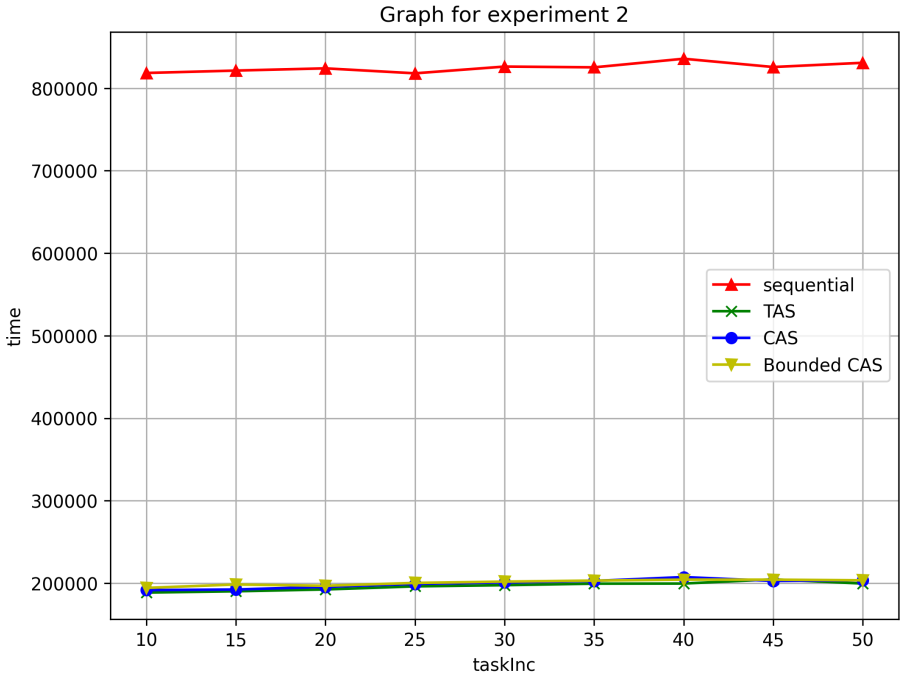
3.3 no of threads

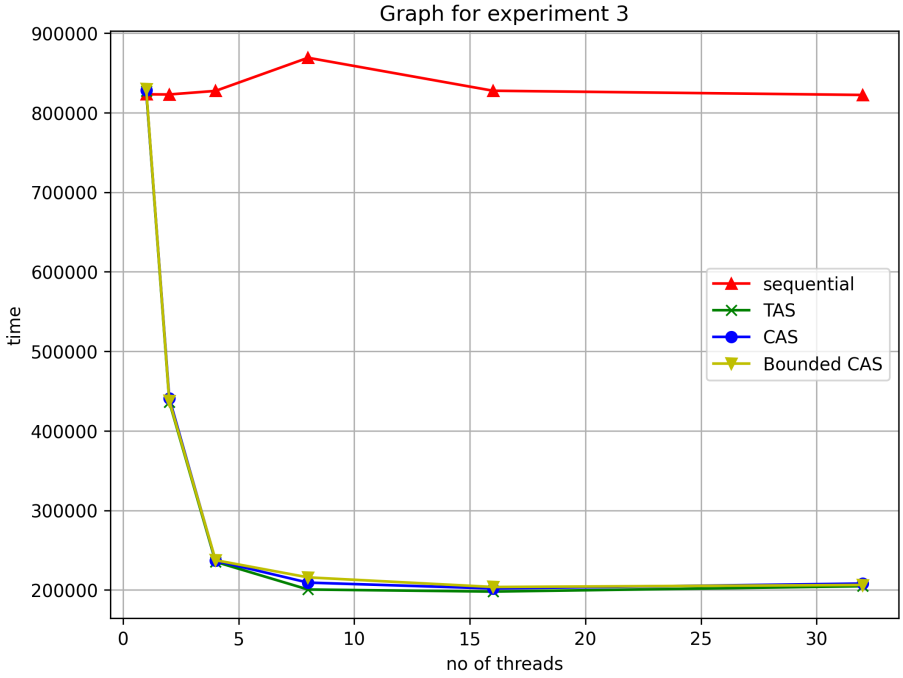
s No.	x-axis	TAS Avg CS Entry Time	CAS Avg CS Entry Time	Bounded CAS Avg CS Entry Time	TAS Avg CS Exit Time	CAS Avg CS Exit Time	Bounded CAS Avg CS Exit Time	Total Time Taken
1	1	0.118241	0.111237	0.0937274	0.150255	0.157061	0.12948	3.30804e+06
2	2	0.206556	0.170985	0.140363	0.166955	0.184339	0.165912	2.13806e+06
3	4	0.283241	0.191015	0.152939	0.167825	0.192984	0.168943	1.53675e+06
4	8	0.489092	0.290513	0.224454	0.273606	0.329969	0.282563	1.49459e+06
5	16	14.6772	10.1905	0.697571	0.366026	5.20467	0.275289	1.43104e+06
6	32	232.359	26.9403	6.00823	0.30414	31.1389	0.952341	1.44127e+06

s No.	x-axis	TAS worst CS Entry Time	CAS worst CS Entry Time	Bounded CAS worst CS Entry Time	TAS worst CS Exit Time	CAS worst CS Exit Time	Bounded CAS worst CS Exit Time	Total Time Taken
1	1	26.9468	13.2547	14.1338	12.487	9.829	9.13	3.30804e+06
2	2	37.0023	9.3518	11.1459	10.2548	6.3443	7.2578	2.13806e+06
3	4	43.985	8.085	7.8019	5.4339	3.2863	3.3322	1.53675e+06
4	8	64.9615	20.7029	7.9199	13.9163	22.1924	12.465	1.49459e+06
5	16	6089.96	1201.29	562.114	123.987	4.0231	8.7329	1.43104e+06
6	32	37272.9	6677.83	4804.07	11.1264	1205.08	804.553	1.44127e+06

4 graphs


Graph for experiment 1
1e6
sequential
TAS
CAS
Bounded CAS
time
size of input
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
2000
4000
6000
8000
10000


Graph for experiment 2
sequential
TAS
CAS
Bounded CAS
time
taskInc
200000
300000
400000
500000
600000
700000
800000
10
15
20
25
30
35
40
45
50



5 observations

1. we can observe the decrease in times when using locks in all three graphs.
2. we can observe in all graphs the times of execution for all locks are almost same
3. as size of input increases the time increases in graph 1
4. as the taskInc increases there is no much effect in the timings in graph 2
5. as no of threads increases the time increases at first but later it will increase.
6. tas entry time is always greater than the other two locks and bounded cas entry time is lowest.