REPORT-CS20BTECH11035

DESIGN:

1. Int read_count: keeps track of number of readers reading at that moment.
2. clock_t waiting_timew: contains sum of waiting times of all writers.
3. clock_t waiting_timer: contains sum of waiting times of all readers.
4. clock_t worst_waiting_timer: contains worst waiting time of readers.
5. clock_t worst_waiting_timew: contains worst waiting time of writers.
6. sem_t rw_mutex: initialized to 1. Used to ensure mutual exclusion for writers.
7. sem_t mutex: initialized to 1. Used to ensure mutual exclusion while updating read_count.
8. sem_t order: initialized to 1. Used to ensure bounded waiting.

VOID WRITER(INT ID):

1. writer function takes thread id as argument.
2. Mutual exclusion of writers is ensured in writers.
3. Writer starts writing only when there are no readers reading.

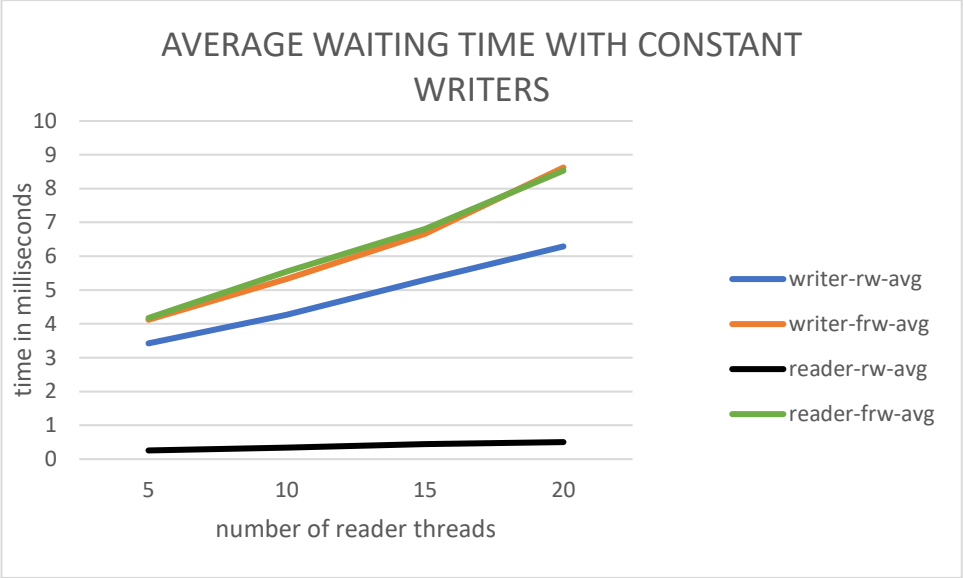
VOID READER(INT ID):

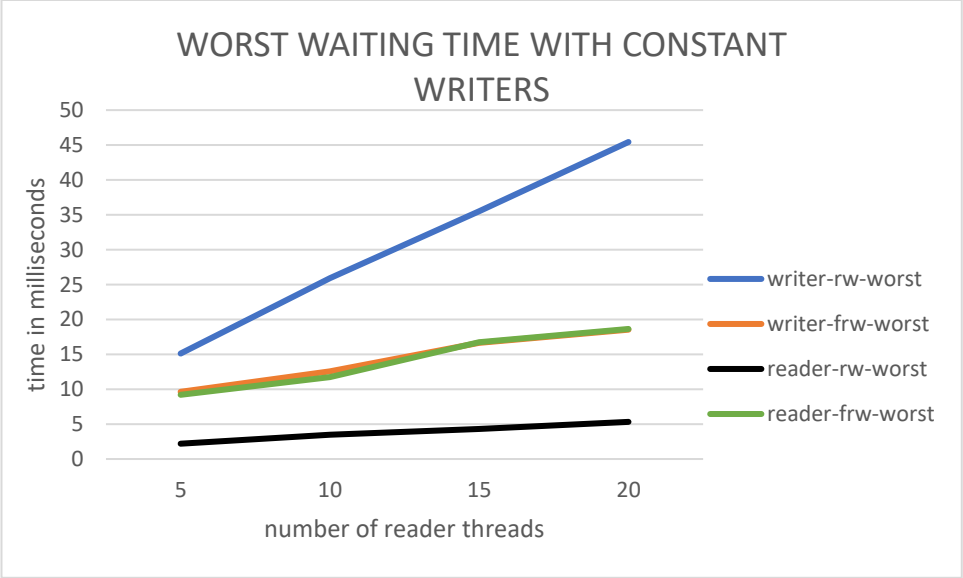
1. reader function takes thread id as argument.
2. Readers start reading if there are no writers writing.
3. Multiple readers can read at a time.

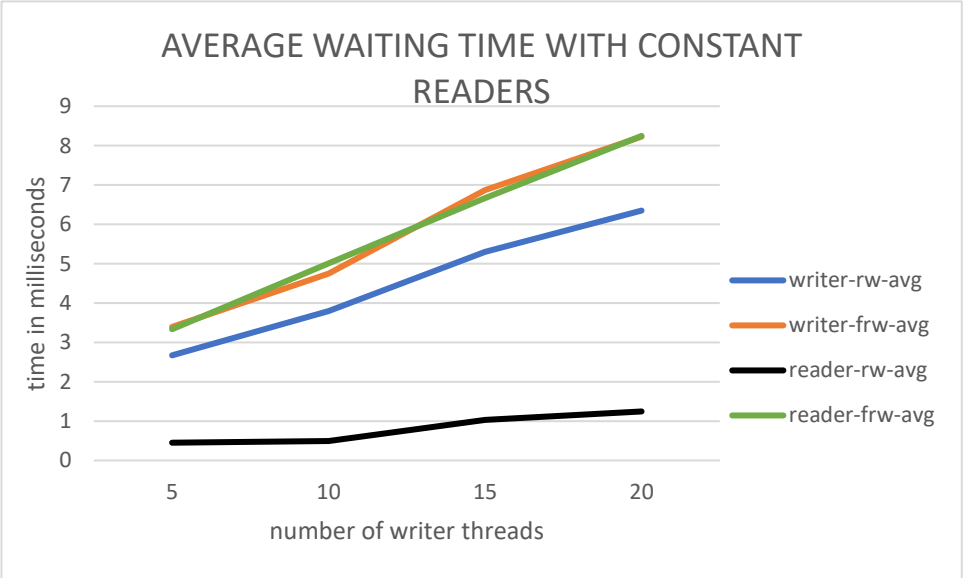
RW-log.txt, FairRW-log.txt contains outputs of Assgn5-rrw-CS20BTECH11035, Assgn5-frw-CS20BTECH11035.cpp respectively. Average_time.txt contains average and worst times of readers and writers.

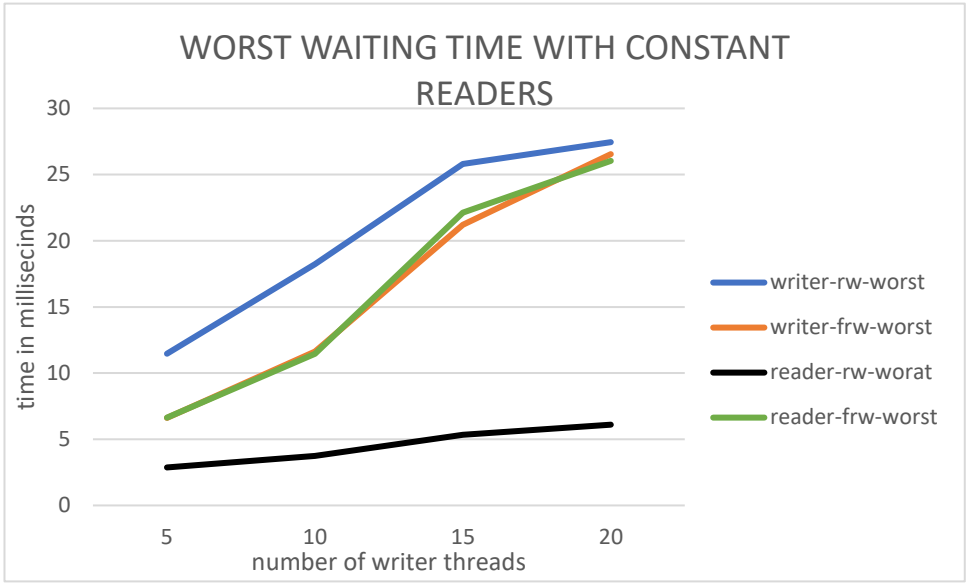
OBSERVATIONS:

1. In graph containing average waiting time with constant writers and varying readers, reader's preference code has more average waiting time for writers and less average waiting time for readers.
2. In graph containing average waiting time with constant writers and varying readers, fair solution code has almost equal average waiting time for writers and readers.
3. In graph containing worst waiting time with constant writers and varying readers, reader's preference code has more worst waiting time for writers and less worst waiting time for readers.
4. In graph containing worst waiting time with constant writers and varying readers, fair solution code has almost equal worst waiting time for writers and readers.
5. In graph containing average waiting time with constant readers and varying writers, reader's preference code has more average waiting time for writers and less average waiting time for readers.
6. In graph containing average waiting time with constant readers and varying writers, fair solution code has almost equal average waiting time for writers and readers.
7. In graph containing worst waiting time with constant readers and varying writers, reader's preference code has more worst waiting time for writers and less worst waiting time for readers.
8. In graph containing worst waiting time with constant readers and varying writers, fair solution code has almost equal worst waiting time for writers and readers.


AVERAGE WAITING TIME WITH CONSTANT WRITERS
time in milliseconds
10
9
8
7
6
5
4
3
2
1
0
5
10
15
20
number of reader threads
writer-rw-avg
writer-frw-avg
reader-rw-avg
reader-frw-avg


WORST WAITING TIME WITH CONSTANT WRITERS
time in milliseconds
50
45
40
35
30
25
20
15
10
5
0
5
10
15
20
number of reader threads
writer-rw-worst
writer-frw-worst
reader-rw-worst
reader-frw-worst


AVERAGE WAITING TIME WITH CONSTANT READERS
time in milliseconds
9
8
7
6
5
4
3
2
1
0
5
10
15
20
number of writer threads
writer-rw-avg
writer-frw-avg
reader-rw-avg
reader-frw-avg


WORST WAITING TIME WITH CONSTANT READERS
30
25
20
15
10
5
0
time in millisecinds
5
10
15
20
number of writer threads
writer-rw-worst
writer-frw-worst
reader-rw-worat
reader-frw-worst