Assignment 2

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problem 1(ConcurrentQueue.cpp)

In this problem I have implement the non-blocking queue from the MS paper. For the implementation I have declared the head and tail of the queue as atomic and have used compare-exchange-weak as CAS(compare and swap).I also free the data when the dequeue operation is successful. There is also one atomic¡int¿ variable named available which store the no of available tickets in the queue.We use this variable when we perform dequeue.The queue class also contains a dump-queue method which print all the data in the queue at any point in time.Then I have created two threads one is consumer and the other is producer as defined in the problem statement and both these thread perform operation on the MS queue concurrently.I have used a global lock mutex m to execute the print statements in a mutually exclusive manner. I have called the consumer and producer thread in main function and also joined them when exiting the main function.

problem 2 part 1(BlockingHashtable.cpp)

In this problem I have just implemented the hash table with chaining for collisions and created a lock array of the same size as the hash table and used the lock[index] when updating hash-table[index]. This means that two function can perform concurrently when they are not updating the same list of the hash table i.e hash-table[index]. The main function call different threads to execute the hash table.The processfile function perform the operation by reading the file and executing the functions. I have used string for easier implementation.

problem 2 part 2(NonBlockingHashtable.cpp)

In this problem I have used the concurrent Queue in problem 1 for non-blocking implementation. In this implementation I have declared concurrent Queue Array of size of the Hash Table and use this data structure for implementation of the functions. I have used the Queue as a linked list. This increase the performance overhead because I have to transverse the Queue twice for deleting and founding function but provide easier implementation.The processfile function perform the operation by reading the file and executing the functions. I have used string for easier implementation.

NOTE:In the implementation of problem 2 both parts are done seperatly. I have modified the template file for easier implementation. The name of the function is remove-delete instead of remove because naming it remove was throwing some error.