GTU Department of Computer Engineering
CSE 344 - SPRING 2022
HOMEWORK 5 REPORT

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1.Design Decisions and Concept

-There is no complex.h library in my source code!

-There is a Buffer that has 3000000 character limit.

-2 file descriptor for 2 files.

-One FILE * for output file.

-1 mutex and 1 condition variable for threads.

-I use getopt to take related flag inputs from user.

-also check related variables' correctness such as m >= 2k , n > 2 or file character content etc.

-Also check for m's value, if m value is bigger than column/row value, i print an error message and exit.

-After that I fill the matrices from the related buffer arrays.

-Than, create m threads for calculating DFT.

-In array calculator threads there was threadID in every thread.

-To calculate C=AxB I divide the B matrix vertical because every thread must fill the columns of C matrix's so that I divide B matrix because of this.

-There was a synchronization barrier in threads.

-Every threads have to wait till the last thread finished its operation.

-If last thread finish its operation than all threads starts to calculate second part.

-For this synchronization barrier, I use the book’s algorithm.

-This algorithm has mutex and condition variable.

-Than every thread calculation its own related column’s DFT values.

-When operation finished thread calls pthread_exit

-Main thread waits till last thread finish its operation.

-After that, main thread write result to a file.

-Finally program gracefully exit and close related files.

-Every console output has its own timestamp

-There is no memory leak in valgrind!

-There is no -Wall warning in my code also!

-Also I use clock() for calculate spending times.