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Homework 3 Report

I used an Ubuntu virtual machine using Oracle VM VirtualBox for this homework. The program was written in gedit. It was compiled by gcc in the Ubuntu terminal.

The program starts in the main function by reading in arguments from the command line. If there are no arguments, it exits with failure. Otherwise, a mutex and a thread array are created. It then creates a thread for each argument and sets them to run the countLines function before joining them. Once the threads are finished, the program destroys the mutex and outputs the total number of lines before exiting successfully.

Each thread runs the countLines function. This function opens the file given in its argument. If the file is opened successfully, it outputs the number of lines in the file before closing the file. It then sends the number of lines to the updateTotal function.

The updateTotal function receives the number of lines from each file from the countLines function. This function starts by locking the mutex. It then adds the number of lines to the total number of lines before unlocking the mutex.

I tested this program using three test files called test1.txt, test2.txt, and test3.txt. These files simply numbered the lines and had 10, 20, and 30 lines respectively. I tested it with every combination of these files, and it passed every test.