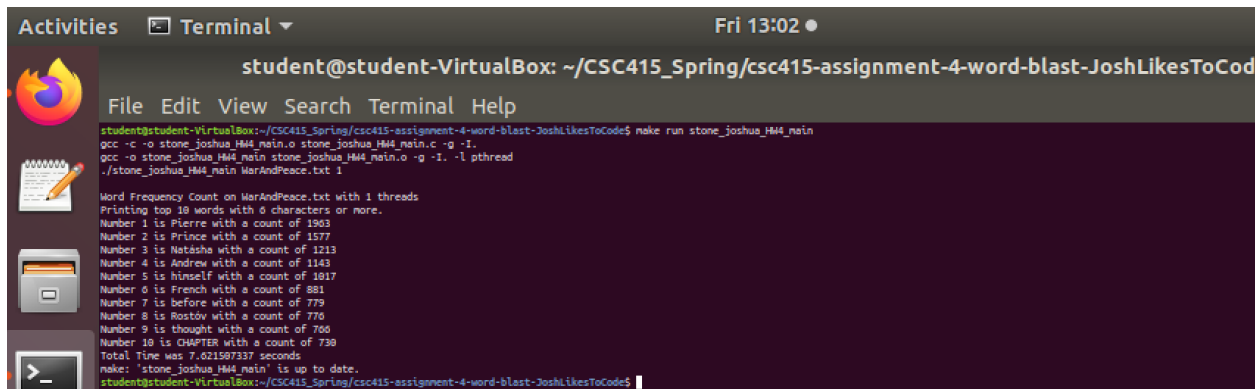


For this project, with the help of threads, I parsed through a text file and stored the words that had a minimum of six characters and their frequencies. I then displayed the top 10 words that had the most frequency within the text file. Some of the issues that I had with this assignment were with where I was suppose to place the mutex locks. Since I was writing to a global data structure I wrapped each “add()” call within a mutex lock and unlock. I also discovered that each time I needed to increment a word’s count, that I too should use a mutex lock and unlock. Another issue I had with this assignment was sorting the data. I tried to at first implement a kind-of quick sort, but was having issues with getting to the word_counts. I decided to take a simpler approach by just thinking out the logic of sorting the word container and storing it’s top 10 in another data structure, which worked quite well. I did program runs with 1, 2, 4, and 8 threads and the results scale quite nicely. With 8 threads the program ran in under a second. Screen shots of these runs are below:

1 Thread:



```

student@student-VirtualBox: ~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$ make run stone_joshua_HM4_main
gcc -c -o stone_joshua_HM4_main.o stone_joshua_HM4_main.c -g -I.
gcc -o stone_joshua_HM4_main stone_joshua_HM4_main.o -g -I. -l pthread
./stone_joshua_HM4_main WarAndPeace.txt 1

Word Frequency Count on WarAndPeace.txt with 1 threads
Printing top 10 words with 6 characters or more.
Number 1 is Pierre with a count of 1963
Number 2 is Prince with a count of 1577
Number 3 is Natasha with a count of 1213
Number 4 is Andrew with a count of 1143
Number 5 is himself with a count of 1017
Number 6 is French with a count of 881
Number 7 is before with a count of 779
Number 8 is Rostov with a count of 776
Number 9 is thought with a count of 766
Number 10 is CHAPTER with a count of 739
Total Time was 7.621587337 seconds
make: 'stone_joshua_HM4_main' is up to date.
student@student-VirtualBox:~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$
  
```

2 Threads:

Activities Terminal Fri 13:04

student@student-VirtualBox: ~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode

File Edit View Search Terminal Help

```
student@student-VirtualBox:~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$ make run stone_joshua_HM4_main
./stone_joshua_HM4_main MarAndPeace.txt 2

Word Frequency Count on MarAndPeace.txt with 2 threads
Printing top 10 words with 6 characters or more.
Number 1 is Pierre with a count of 1803
Number 2 is French with a count of 583
Number 3 is himself with a count of 526
Number 4 is Moscow with a count of 525
Number 5 is Natásha with a count of 489
Number 6 is Napoleon with a count of 457
Number 7 is Prince with a count of 416
Number 8 is before with a count of 392
Number 9 is people with a count of 369
Number 10 is Andrew with a count of 346
Total Time was 3.297820715 seconds
make: 'stone_joshua_HM4_main' is up to date.
student@student-VirtualBox:~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$
```

4 Threads:

Operating Systems [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Fri 13:05

student@student-VirtualBox: ~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode

File Edit View Search Terminal Help

```
student@student-VirtualBox:~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$ make run stone_joshua_HM4_main
./stone_joshua_HM4_main MarAndPeace.txt 4

Word Frequency Count on MarAndPeace.txt with 4 threads
Printing top 10 words with 6 characters or more.
Number 1 is Pierre with a count of 594
Number 2 is Natásha with a count of 331
Number 3 is French with a count of 331
Number 4 is Nicholas with a count of 247
Number 5 is himself with a count of 243
Number 6 is people with a count of 281
Number 7 is before with a count of 195
Number 8 is Moscow with a count of 195
Number 9 is Princess with a count of 189
Number 10 is without with a count of 181
Total Time was 1.439238808 seconds
make: 'stone_joshua_HM4_main' is up to date.
student@student-VirtualBox:~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$
```

8 Threads:

Activities Terminal Fri 13:06

student@student-VirtualBox: ~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode

File Edit View Search Terminal Help

```
student@student-VirtualBox:~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$ make run stone_joshua_HM4_main
./stone_joshua_HM4_main MarAndPeace.txt 8

Word Frequency Count on MarAndPeace.txt with 8 threads
Printing top 10 words with 6 characters or more.
Number 1 is Pierre with a count of 269
Number 2 is Natásha with a count of 229
Number 3 is people with a count of 145
Number 4 is Nicholas with a count of 145
Number 5 is himself with a count of 117
Number 6 is history with a count of 115
Number 7 is Princess with a count of 180
Number 8 is without with a count of 99
Number 9 is French with a count of 97
Number 10 is before with a count of 88
Total Time was 0.568222412 seconds
make: 'stone_joshua_HM4_main' is up to date.
student@student-VirtualBox:~/CSC415_Spring/csc415-assignment-4-word-blast-JoshLikesToCode$
```