TCES 420 (Operating Systems)

Project 3

Due Monday 11/9/2020

10 points

In this project you will observe the effect of multi-threading on performance.

You multiply two 1000x1000 double precision matrices. Send me the documented code, and screen shots of the terminal that shows your runs.

Part 1

1- In your "main" read data from matrix1.data file into first[1000][1000] double precision array.
2- In your "main" read data from matrix2.data file into second[1000][1000] double precision array.
3- You can use the following code for reading file into array:

```
FILE *fp;
fp = fopen("matrix.data", "rb");
fread(first, sizeof(double), sizeof(first)/sizeof(double), fp);
fclose(ifp);
```

4- Develop the "multiply" function, and perform `mult=first*second`
5- In your "main" write the mult[1000][1000] array into matrix3.dat file.
6- Before exiting from main, add the following line:

```
printf("%lf %lf %lf %lf\n", malt[6][0], malt[5][3], malt[5][4],
malt[901][7]);
```

Part 2

1- Split "first" into two matrices of sizes [500][1000].
2- Call the "multiply" function twice. One call for each section of "first". You should get the same result as in part 1.

Part 3

1- Rewrite the "multiply" function as a thread.
2- Repeat part 2. You should get the same result as in part 1.

Part 4

- Run part 2 and part3 with "time". Explain the difference (if any).