Project 3 Design Document

Goal:

Design a program to do matrix multiplication that spreads out each multiplication step over a different thread.

Outline:

Input a file containing 2 matrices that will be multiplied. There will be N number of multiplications so for each one of them, call a different thread to do it.

Solution:

First thing I did was set up the matrices in a readable fashion. Originally I used a 2d array set up as int matrix[][], however, I was not able to pass them into the threads so I ended up using a vector of vectors. I found out the dimensions of each matrix and resized the 2d vectors as needed. Once properly sized I read in all the data.

My vectors were global so the only thing I had to do was figure out how many times there was going to be multiplication. I ran the pthread\_create that many times and passed in its number.

Inside the thread I reasoned out where each multiply was going to take place. If it was the first thing in the matrix then it assigned it, if it wasn’t then it added it. After they all completed the result was the multipled matrix.

Explanation:

The reason it worked out was because I could mathematically figure out all the elements I needed to work with. A lot of % was used here.

Flow:

The threads take in a number and computes where it is in the matrix multiplication table to find out what operations needs to be done.