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CSCE 735
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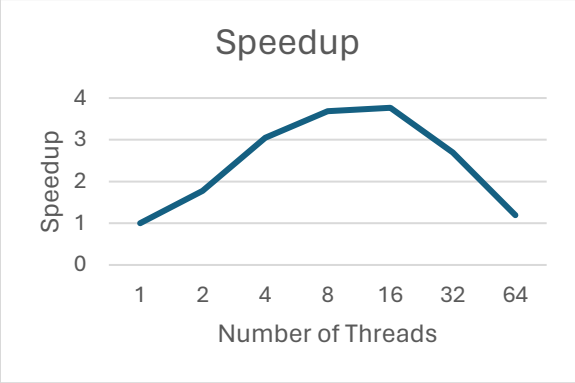
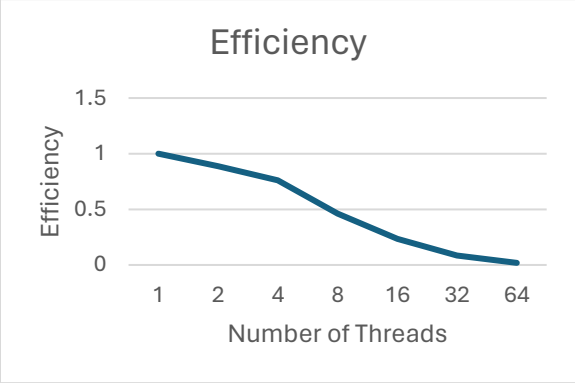
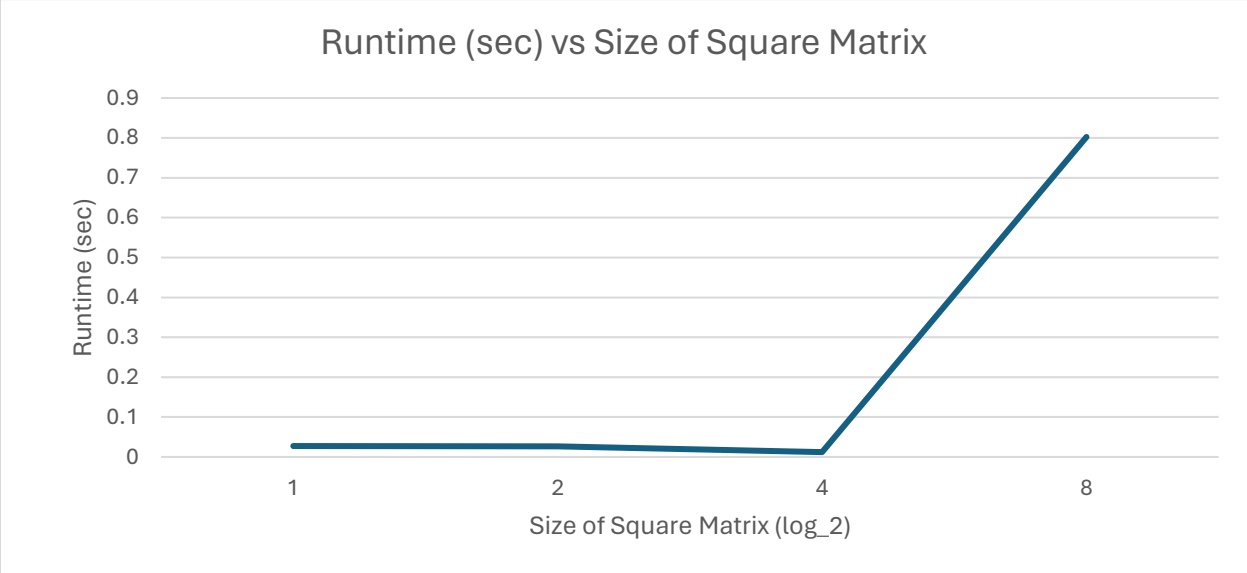
Major Project

Setting the size of the matrix to be $2^{10} \times 2^{10}$ and the terminal matrix size as 32×32, the following two graphs display speedup and efficiency.

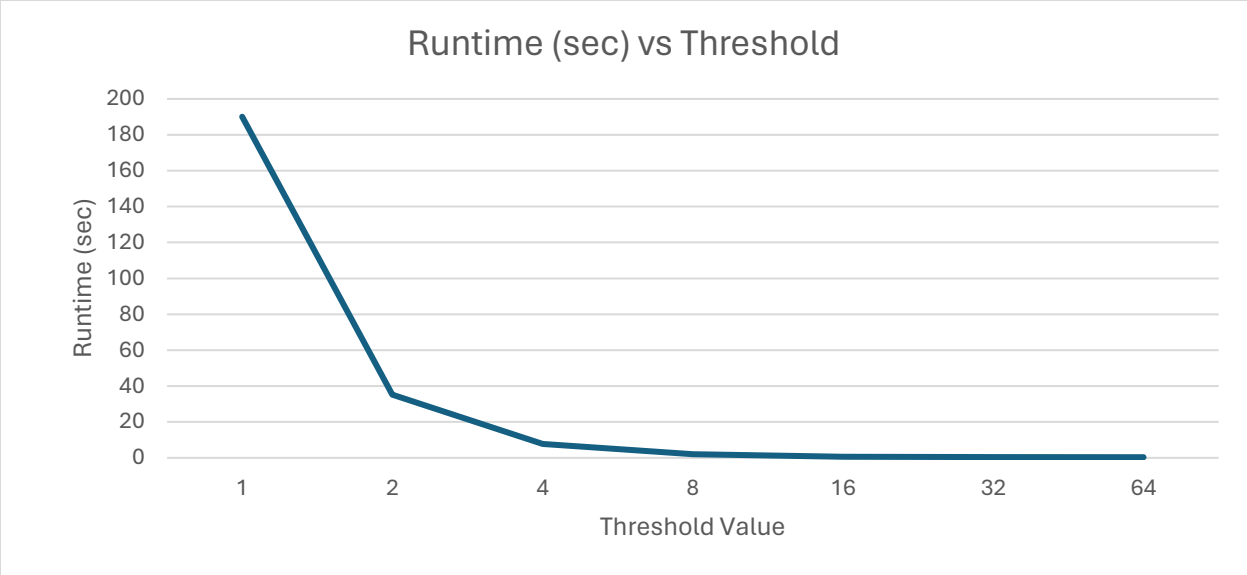




The graph below displays the runtime of the program as the size of the matrix increases. The x-axis indicates $\log_2$ of the dimensions.



This graph shows the runtime of the program as the size of the terminal matrix changes.



To improve the runtime of the program I utilized parallel computing principles to compute the seven sub-matrices in parallel. I also computed the four quadrants of the matrices in parallel as well. Adding some waiting in order to properly deallocate memory ensures that the program does not use too much memory at once.

To compile this code run the following command:

```
module load intel
```

```
icc -qopenmp -o main.out strassen.cpp
```

The program takes in three arguments: k, k_prime, and num_threads.

An example run command would be:

```
./main.out 10 32 8
```