**Question1**.

File: a2q1.c

Compile Code:  
mpicc -o a2q1.x a2q1.c

mpirun -np 4 ./test.x 10

On School’s server, for running up to around 30s, can use:  
mpirun -np 100 ./test.x 1000

Analysis:

Big O = n log n for one process, n = N/p

If based on Amdahl’s Law, A black and white text

Description automatically generated,

After running 82%

Output:

A computer screen with numbers and letters

Description automatically generated

**Question2**.

Part1 file: q2p1.c

In my understanding from the hint and question description, file means in process 0 it can be generating a 16x16 matrix, and send each block, 4x4, to itself and p1, p2 and p3.

Thoughts:

- Cut 16x16 block into 4x4

- Send 4x4 for each process, using code below to get starting row and col.  


- time = n/block\_size to get total looping times, 4 times means there are 4 rows for 4 processes to get 16x16 matrix.

- Use MPI\_Barrier(MPI\_COMM\_WORLD); to sync each process.

Output:

