Homework 5

Student Name	Muhammed Oğuz
Student Number	1801042634

Problem Solution Approach

This problem aims to use Mutexes and condition variables. Other problems related to other homeworks and I solved most of the problems on previous homework.

My Approach

There was a main problem for this homework. It was the being sync and waiting till all thread to finish to continue to second part. For solving that, I used a mutex and a condition variable.

Other challenge was the m and n variables are not fully divisible on some cases.

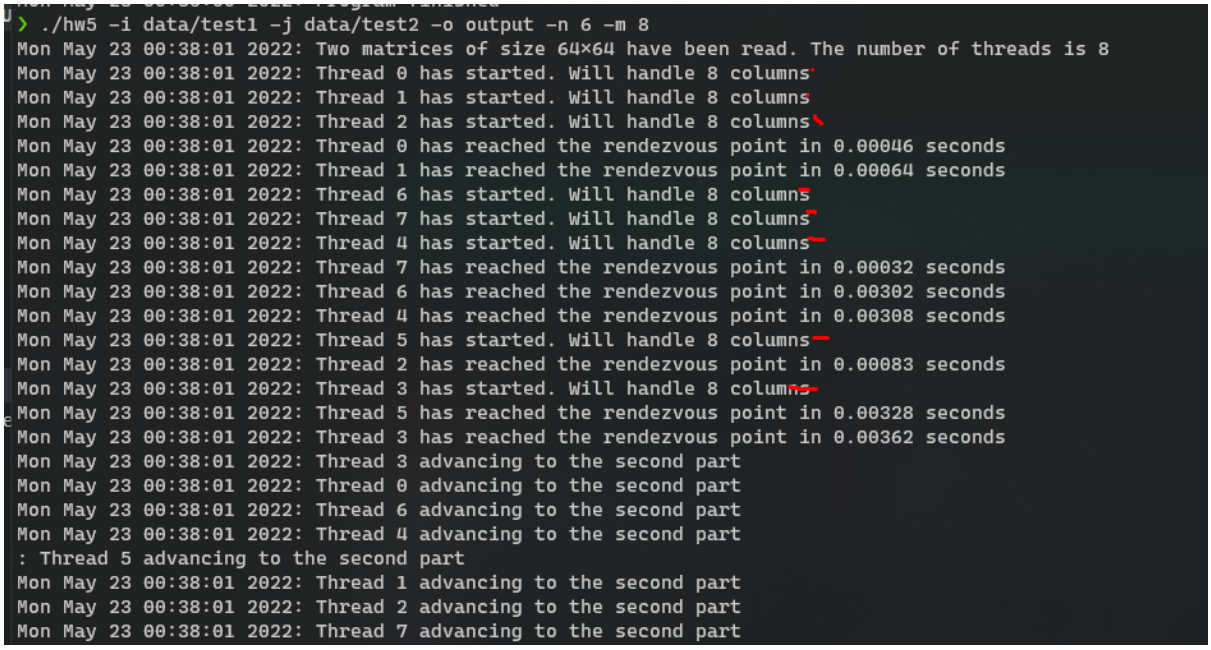
If m is already of 2^n , There is no problem.
But if not divisible exactly to 2^n. It should be handled.

So I handle this problem with detecting remaining columns and I calculated remaining columns to last thread.

If user enters n=6 (2^n = 64) and m = 14, Each thread will calculate 4 columns and last thread will calculated 8 columns.

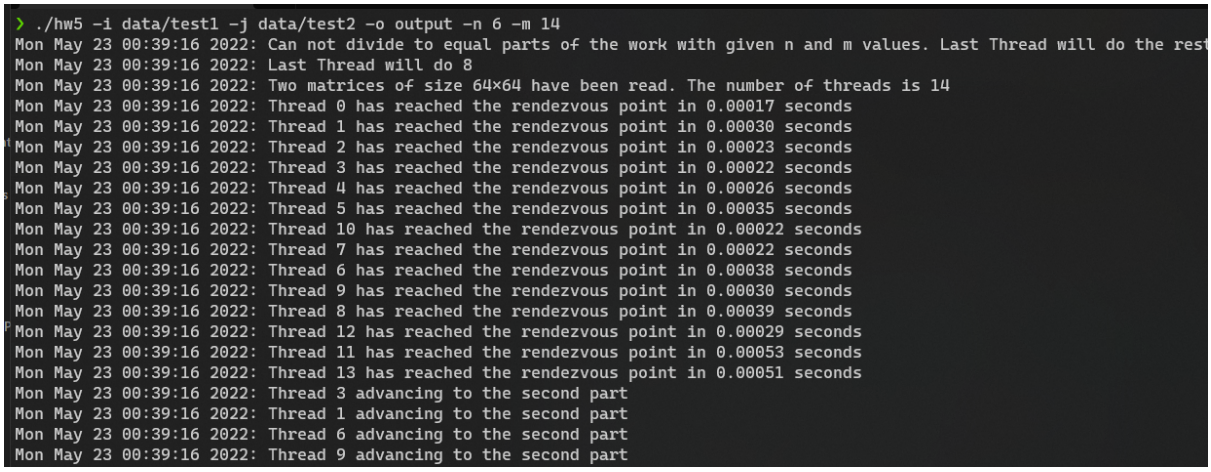
Validation for homework

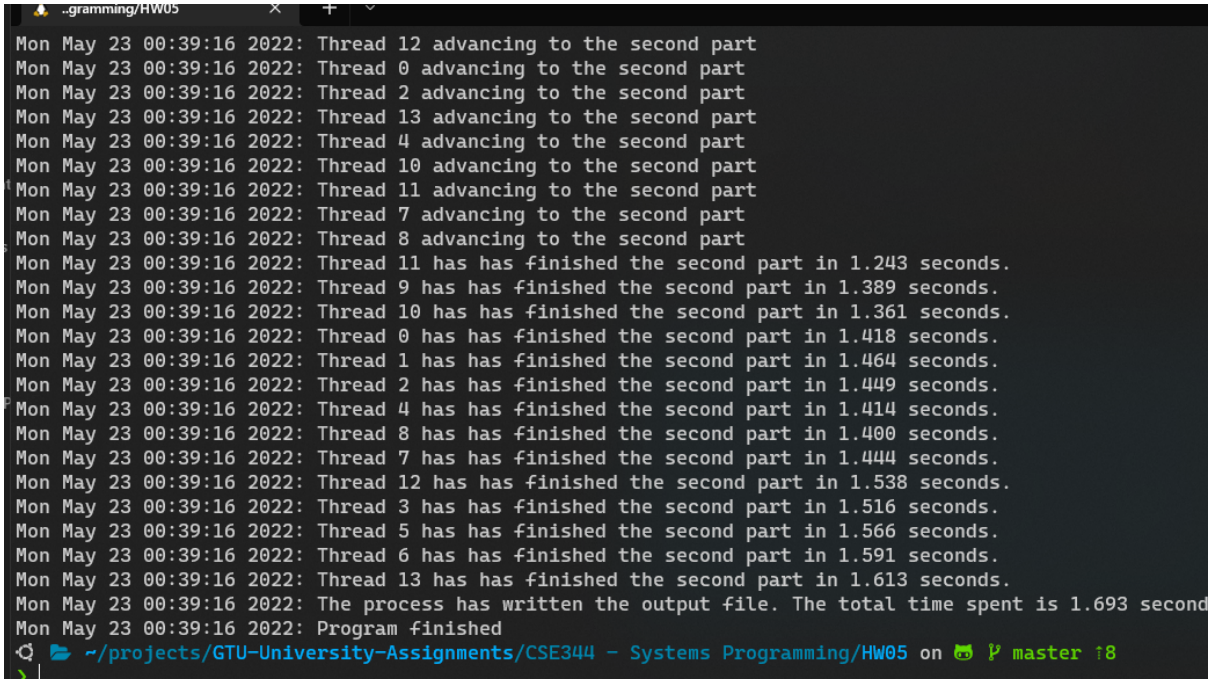
Threads working correctly. This screenshot shows that threads working without any problem.



💡 Note: Notice that, remarked prints are commented in on last code.

Running Results



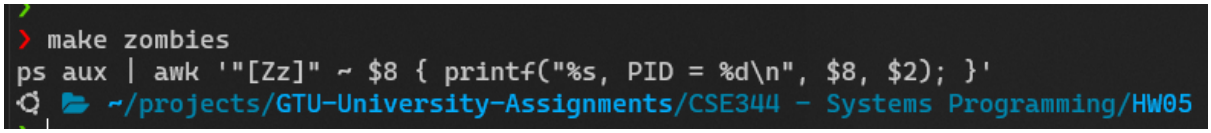


Leak results

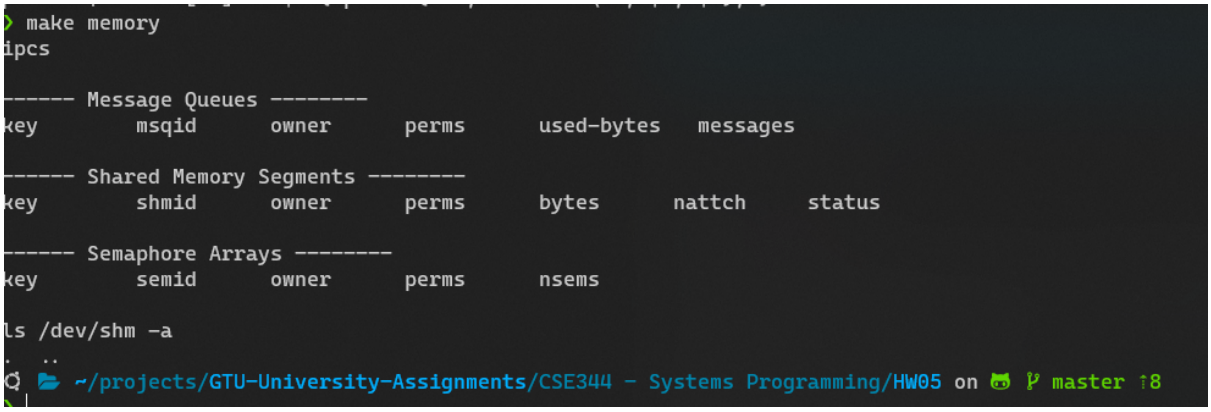
After running `make memory`, `make_zombies` and `make valgrind`, there is no un freed or zombie or unlinked shared mem or unfreed semaphore or not destroyed mutex or condition variable.

> 💡 Notice that, Since I use static initialization, There is no need to use pthread_destroy for my mutexes.

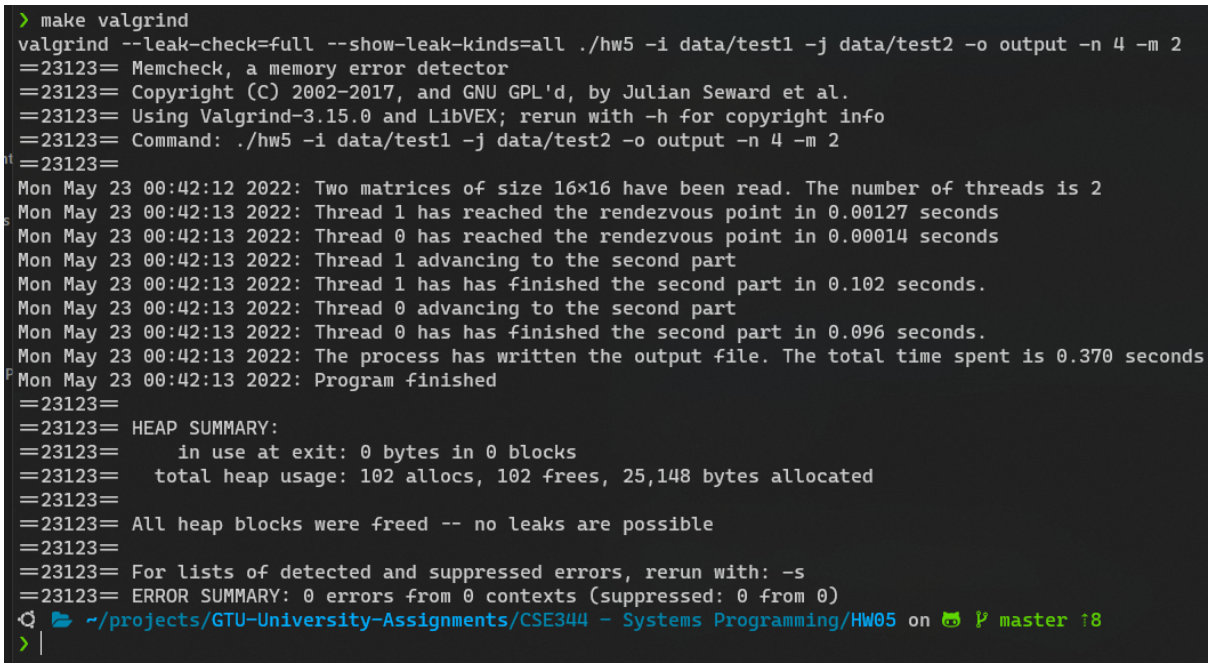
Zombie result



Shared Mem Result



Valgrind Result



Missing Parts of Homework

I carefully checked my homework and it seems everything works fine.