Assignment Report

Syed Alle Mustafa (A20519664)

October 5, 2022

1. Parallelizing through OpenMP and Pthreads.

   For parallelizing the Gaussian elimination, the outer loop couldnt be parallelized because of the loop carried dependency, but the inner loop could be parallelized so it was parallelized in openMP straightaway by the compiler keyword. Where as in Pthreads, a separate function is written for each thread to run, this thread runs the inner loop i range given by the thread id. The backpropagation was parallelized in both technologies but no big difference was noticed in it. The time took by each program is given in the snaps below.

```
-----------------------------------------------
smustafa2@fusion2:~$ ./serial 2000 100

Matrix dimension N = 2000.

Initializing...

Starting clock.
Computing Serially.
Stopped clock.

Elapsed time = 7458.39 ms.
(CPU times are accurate to the nearest 0.001 ms)
My total CPU time for parent = 0.747 ms.
My system CPU time for parent = 0.002 ms.
```

```
-----------------------------------------------
smustafa2@fusion2:~$ ./pthread 2000 100 5
Random seed = 100

Matrix dimension N = 2000.

Initializing...

Starting clock.
Computing Through Pthreads.
Stopped clock.

Elapsed time = 15.988 ms.
(CPU times are accurate to the nearest 0.001 ms)
My total CPU time for parent = 0.002 ms
```

```
smustafa2@fusion2:~$ ./openMp 1000 10 100
Random seed = 10

Matrix dimension N = 1000.

Initializing...

Starting clock.
Computing Through OpenMP.
Stopped clock.

Elapsed time = 4432.44 ms.
(CPU times are accurate to the nearest 0.001 ms)
My total CPU time for parent = 11.144 ms.
My system CPU time for parent = 0.091 ms.
```