EC527 Assignment 8 Chen-Yu Chang

How I generate the matrix elements is by using initialize_array () function which uses a known seed for random number generation.

Part 1:

1024 X 1024

```
Starting outer cuda timing
Transfering arrays to GPU
Starting outer cuda timing
Running kernel
Copying cuda results to host
Computing MMM on host
Comparing results
Freeing memory
Printing results

GPU outer loop time: 5.066880 (msec)

GPU inner loop time: 1.180768 (msec)

CPU time: 6733.980469(msec)
Max difference = 422212465065984.000000, Min difference = 0.000000, Average diff
erence = 33575168638976.000000, Average = 11802802390244251402 24.000000, Not a n
umber = 0
```

2048 X 2048

```
Starting outer cuda timing
Transfering arrays to GPU
Starting outer cuda timing
Running kernel
Copying cuda results to host
Computing MMM on host
Comparing results
Freeing memory
Printing results

GPU outer loop time: 22.510368 (msec)

GPU inner loop time: 9.278240 (msec)

CPU time: 52740.718750(msec)
Max difference = 844424930131968.000000, Min difference = 0.000000, Average diff
erence = 67264422346752.000000, Average = 23610344819096310251 52.000000, Not a n
umber = 0
```

Part 2:

1024 X 1024

```
Starting outer cuda timing
Transfering arrays to GPU
Starting outer cuda timing
Running kernel
Copying cuda results to host
Computing MMM on host
Comparing results
Freeing memory
Printing results

GPU outer loop time: 4.501952 (msec)

GPU inner loop time: 0.706272 (msec)

CPU time: 6793.972168(msec)
Max difference = 422212465065984.000000, Min difference = 0.000000, Average diff
erence = 33575168638976.000000, Average = 1180280239024425140224.000000, Not a n
umber = 0
```

2048 X 2048:

```
Starting outer cuda timing
Transfering arrays to GPU
Starting outer cuda timing
Running kernel
Copying cuda results to host
Computing MMM on host
Comparing results
Freeing memory
Printing results

GPU outer loop time: 18.866272 (msec)

GPU inner loop time: 5.362912 (msec)

CPU time: 58231.890625(msec)
Max difference = 844424930131968.000000, Min difference = 0.000000, Average diff
erence = 67264422346752.000000, Average = 2361034481909631025152.000000, Not a n
umber = 0
```

Part 3:

1024 X 1024:

```
Starting outer cuda timing
Transfering arrays to GPU
Starting outer cuda timing
Running kernel
Copying cuda results to host
Computing MMM on host
Comparing results
Freeing memory
Printing results

GPU outer loop time: 4.546560 (msec)

GPU inner loop time: 0.708096 (msec)

CPU time: 7201.858398(msec)
Max difference = 2674012278751232.000000, Min difference = 0.000000, Average dif
ference = 427913564389376.000000, Average = 1180280239024425140224.000000, Not a
 number = 0
```

2048 X 2048:

```
Starting outer cuda timing
Transfering arrays to GPU
Starting outer cuda timing
Running kernel
Copying cuda results to host
Computing MMM on host
Comparing results
Freeing memory
Printing results

GPU outer loop time: 18.619520 (msec)

GPU inner loop time: 5.345536 (msec)

CPU time: 53425.234375(msec)
Max difference = 7881299347898368.000000, Min difference = 0.000000, Average dif
ference = 1199816562442240.000000, Average = 2361034622647119380480.000000, Not
a number = 0
```