ELEC 374 | Digital Systems Engineering

Machine Problem# 4

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# Results

The results for tiled matrix multiplication can be seen below. We can see that tiled based multiplication provided much better processing times than the baseline matrix multiplication from machine problem 3. The smaller the tile widths the closer the processing time approached to the results of the baseline matrix multiplication algorithm.

Figure 1 – Tiled Matrix Multiplication

1. While using the current kernel implementation the number of threads that can be simultaneously scheduled on this device with 14 streaming multiprocessors is 2048x14 which is 28672 threads.
2. The resource usage of the kernel used is shown in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| # of Registers | Shared Memory Size | Number of Blocks per Streaming Multiprocessor | Maximum Total Threads |
| 63 per thread | 64KB | (Tile width\*Tile width)/ 14 | 14 SMs  8 CUDA cores  32 threads per core  = 3584 |

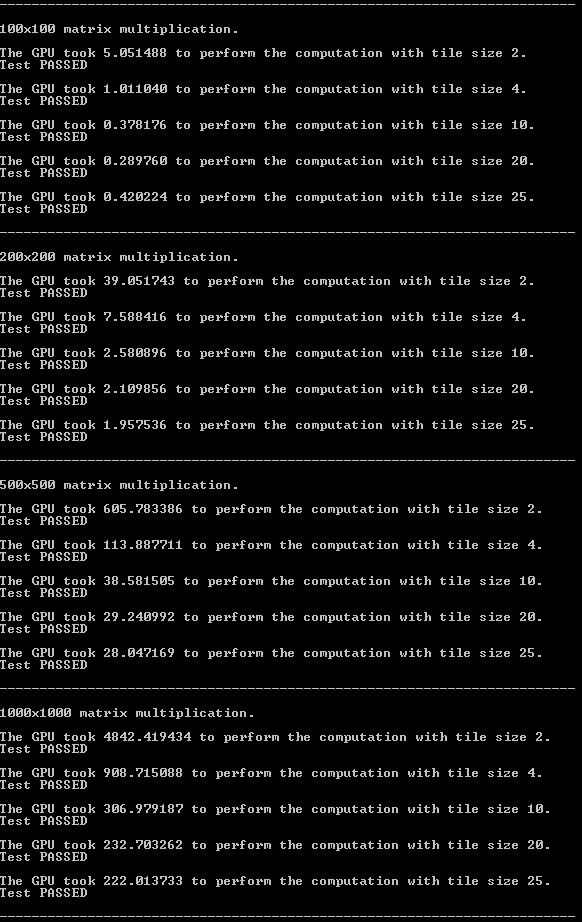


Figure 2 – Tiled Matrix Multiplication Results #1

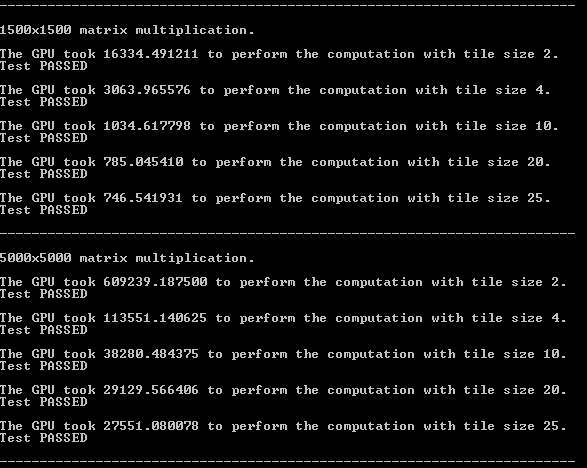


Figure 3 - Tiled Matrix Multiplication Results #2

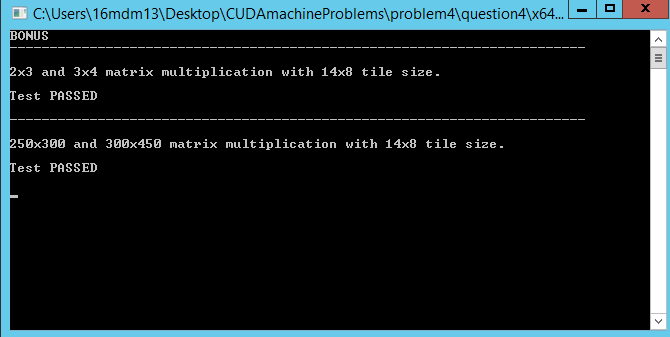


Figure 4 - BONUS Tiled Matrix Multiplication Results

The code for the problem is located in “.\question4\question4\kernel.cu”.