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| Name: | Edward Eisenberger |
| ID# | 1066164 |
| Assignment 9 | |
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# Overview

Assignment 09 consisted implementing the examples in the “GPU Programming Using CUDA and Alea GPU” handout.

# Summary

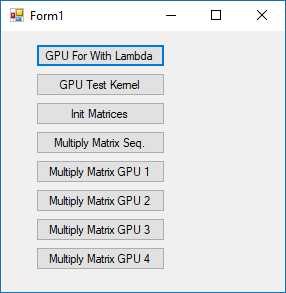
Assignment 09 was implemented in a single Visual Studio 2017 solution, Assignment09, and contains two projects: GPUAleaTest and PyCudaTest.

GPUAleaTest contains the implementations for the Alea GPU examples.

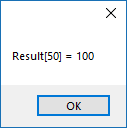
PyCudaTest contains the implementations for the Python examples and exercise.

# Results

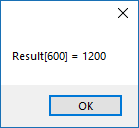
## Alea GPU Application



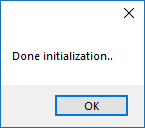
## Alea GPU.For with Lambda Expression



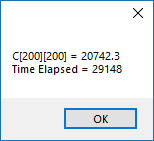
## Alea GPU with Kernel



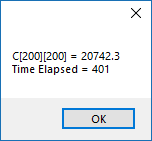
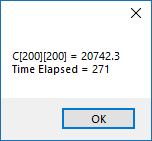
## Matrix Initialization



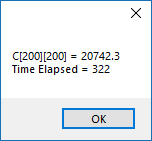
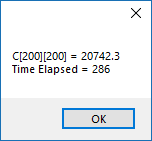
## Matrix Multiplication: Sequential



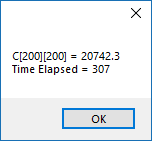
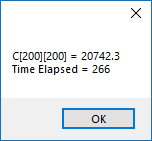
## Matrix Multiplication: Alea GPU Kernel 1

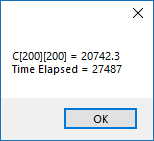
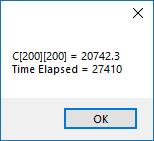
## Matrix Multiplication: Alea GPU Kernel 2

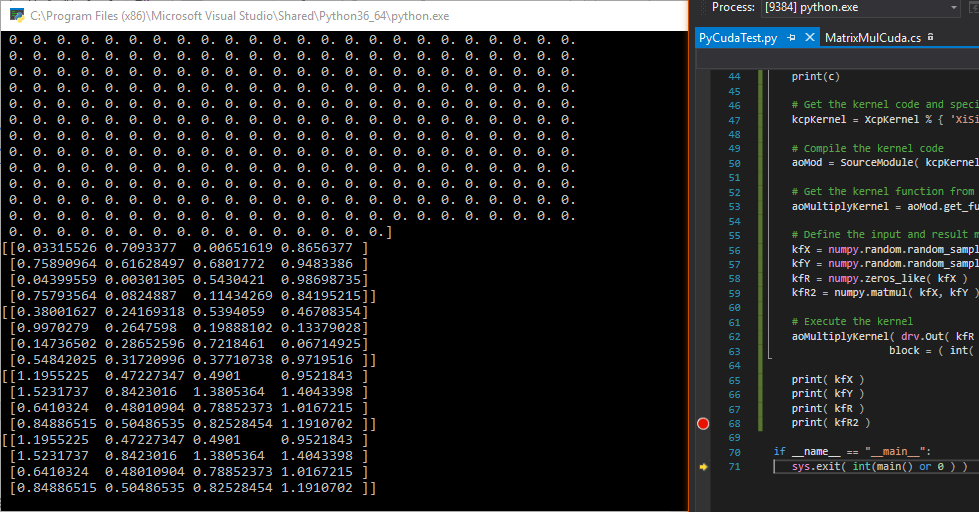
## Matrix Multiplication: Alea GPU Kernel 3

## Matrix Multiplication: Alea GPU Kernel 4 (GPU.For)

## PyCuda: Element-Wise Array Multiplication and Matrix Multiplication



The figure above contains the outputs of the Element-Wise Array Multiplication result array as well as the matrices contained in the Matrix Multiplication:

* The first matrix is input X
* The second matrix is input Y
* The third matrix is the result of the GPU Matrix Multiplication X \* Y
* The fourth matrix is the result of the sequential Matrix Multiplication via numpy.matmul