CS3811 - High Performance Computing and Big Data Lab

Lab 7

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> Class: Cyber Security(Semester 5)

Experiment 1

Objective

Write a C to perform elementwise multiplication using CUDA.

Code

Written in C.

```
%%cuda

#include <stdio.h>

__global__ void vectorMultiply(int *a, int *b, int *c) {
    int ind = threadIdx.x;
    c[ind] = a[ind] * b[ind];
}

int main() {
    int n = 5;
    int a[n] = {1, 2, 3, 4, 5};
    int b[n] = {10, 9, 8, 7, 6};
    int c[n];

    int *d_a, *d_b, *d_c;
    cudaMalloc((void **)&d_a, n * sizeof(int));
    cudaMalloc((void **)&d_b, n * sizeof(int));
    cudaMalloc((void **)&d_c, n * sizeof(int));

    cudaMemcpy(d_a, a, n * sizeof(int), cudaMemcpyHostToDevice);
    cudaMemcpy(d_b, b, n * sizeof(int), cudaMemcpyHostToDevice);

    vectorMultiply<<<1, n>>>(d_a, d_b, d_c);

    cudaMemcpy(c, d_c, n * sizeof(int), cudaMemcpyDeviceToHost);
```

```
    for (int i = 0; i < n; i++) {
        printf("c[%d] = %d\n", i, c[i]);
    }

    cudaFree(d_a);
    cudaFree(d_b);
    cudaFree(d_c);

    return 0;
}
```

Output

```
c[0] = 10
c[1] = 18
c[2] = 24
c[3] = 28
c[4] = 30
```