UCS547

Assignment II – CUDA C++ Programming

1. Identify !, %, and %% used in cell in Google Colab.
2. Identify all key nvidia-smi commands with multiple options
3. Debug common CUDA errors (zero output, incorrect indexing, PTX errors)
4. Write a CUDA C/C++ program to demonstrate GPU kernel execution and thread indexing.
    a. Launch a CUDA kernel using: 1 block and 8 threads
    b. Each thread must print: *Hello from GPU thread <global_thread_id>*
    c. Compute the global thread ID using: global_thread_id = blockIdx.x * blockDim.x + threadIdx.x
    d. Clearly separate: Host code (CPU) & Device code (GPU kernel)
5. Write a CUDA program to demonstrate host and device memory separation.
    a. Create an integer array of size 5 on the host (CPU).
    b. Allocate corresponding memory on the device (GPU) using cudaMalloc().
    c. Copy data from host to device using cudaMemcpy().
    d. Launch a kernel where GPU threads print values from device memory.
    e. Copy the data back from device to host and print it on CPU.
6. Compare CPU times of List/tuple with Numpy arrays.