GPUs and CUDA Programming Hands-On Session

The goal of this session is to help you understand some basics in writing cuda programs.

Instructions for setup:

Note that to run your CUDA program, you require a CUDA capable device. In this session, we will use Google Colab platform. It provides a jupyter notebook hosted by Google cloud machines that can support GPUs.

Please follow the instructions in the below link to setup your GPU environment in the Google Colab:

https://www.geeksforgeeks.org/how-to-run-cuda-c-c-on-jupyter-notebook-in-google-colaboratory/

Execute the steps 1 to 7, but skip 3-4 as the latest CUDA is installed by default.

You can check if nvcc is successfully installed by checking its version in Step 5.

You can check if GPU is allocated successfully by executing the below command:

```
!nvidia-smi
```

Task-1:

Execute the following demo codes (discussed in today's lecture) and get the expected output. The codes are located in Canvas at Files/GPU_CUDA_Demos

Demo Codes:
Demo1.cu
Demo2.cu
Demo3.cu
Demo4.cu
Demo5.cu
Demo6.cu
Demo7.cu

Task-2: (Writing simple CUDA program)

For a given integer a and two arrays X and Y (both of size N<=1024), write a CUDA program to compute an array Z, such that Z = a*X+Y.

You can use the following template code for completing your program
https://docs.google.com/document/d/15kh05TBZN4CO_pwEyBZU3khRj_hME0DuuOp8nNjZd_A/edit?usp=sharing

You can refer to the CUDA programming guide for syntax.
https://docs.nvidia.com/cuda/cuda-c-programming-guide/index.html