Getting Started with CUDA

Running an example CUDA code

Start with downloading the zip file named “vectorAdd.zip” from Moodle. Move this zip file to the hydra cluster. From there, run the following commands to make sure everything is setup properly,

```
$ unzip vectorAdd.zip
$ cd vectorAdd
$ make
$ ./vectorAdd
```

Once you run the program, you should see “Test PASSED” printed out. You can take a look at the Makefile and the CUDA code to see how they work.

Measuring kernel execution time

You will need to measure the kernel execution time and include it in your report. There are several different ways of doing this, but the easiest is to use **CUDA events**. See the example below,

```
// Create CUDA events...
cudaEvent_t start, stop;
cudaEventCreate(&start);
cudaEventCreate(&stop);

cudaMemcpy(d_x, x, N*sizeof(float), cudaMemcpyHostToDevice);
cudaMemcpy(d_y, y, N*sizeof(float), cudaMemcpyHostToDevice);

// Launch the kernel and take timestamps before and after
cudaEventRecord(start);
saxpy<<<(N+255)/256, 256>>>(N, 2.0f, d_x, d_y);
cudaEventRecord(stop);

cudaMemcpy(y, d_y, N*sizeof(float), cudaMemcpyDeviceToHost);

// Extract the timing information
cudaEventSynchronize(stop);
float milliseconds = 0;
cudaEventElapsedTime(&milliseconds, start, stop);
```

See this link for more information on this.