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Assignment 4

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Chapter 1

Theory

1.1 Problem 1

- i : False (Write once, compile at runtime and run everywhere.)
- ii : True, but CUDA is specialized to only run on nvidia GPGPUs.
- iii : False, it is designed to run on GPUs, CPUs, FPGAs and even DSPs
- iv : True

1.2 Problem 2

1.2.1 Task A

- Thread == Work Item
- Block == Work Group
- No direct correspondance between CUDAs local memory and OpenCL. Local memory in CUDA resides in the scope of Global memory in OpenCL.
- Shared Memory == Local Memory
- Global Memory / Device Memory == Global memory

1.2.2 Task B

Subtask I

CUDA is single platform in the sense that it only runs on CUDA-enabled NVidia graphics processors. The implementation itself can run on different operating systems, but i did not consider that to be the question here.

OpenCL is multi-platform, and is designed to run on a multitude of devices.

Subtask II

CUDA can only be compiled to CUDA enabled NVidia graphics processors.

OpenCL uses what is known as JIT-compiling, which compiles the kernel to the specific target architecture at run-time, thus allowing the kernel code to run on different architectures. The target compiler is usually provided by the company behind the architecture, such as either NVidia, AMD or Intel. OpenCL is only a standard, hence implementation may be done by different parties.