**Blue Waters Petascale Semester Curriculum v1.0**

**Unit 3: Using a Cluster**

**Lesson 1: Parallel Architecture 1**

**Exercise Instructions for Students**

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*Browse and search the full curriculum at*[*http://shodor.org/petascale/materials/semester-curriculum*](http://shodor.org/petascale/materials/semester-curriculum)

*We welcome your improvements! You can submit your proposed changes to this material and the rest of the curriculum in our GitHub repository at*[*https://github.com/shodor-education/petascale-semester-curriculum*](https://github.com/shodor-education/petascale-semester-curriculum)

*We want to hear from you! Please let us know your experiences using this material by sending email to* [*petascale@shodor.org*](mailto:petascale@shodor.org)

Problem 1: Describe the difference between a GPU and a CPU. Include a discussion of vector instructions in the CPU’s instruction set and how the CPU and GPU are different in this case.

Problem 2: Investigate the cache and memory system for one CPU and one GPU of your choice. Compare the memory architectures of these two platforms.