CSC718 Class Project

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- Objective
  - use the parallel programming languages learned from the class to solve a computing intensive problem and demonstrate how parallel programming can be used to

Class Project

- Part 1 Identify a problem to solve
- Part 2 Provide three solutions to solve the same problem
  - One sequential program
  - Two parallel programs

Parallel Programming Frameworks

- Parallel programming frameworks for consideration
  - Multithreaded programing
  - MPI, openMP, CUDA: to be discussed in the class
  - More parallel programming frameworks available such as OpenCL, OpenACC, etc.

How About Python, C#, …

- You can also choose a language, e.g., python C#, other than C/C++ for the class project
  - MPI support in Python is possible
  - https://mpi4py.readthedocs.io/en/stable/
- Contact with me if you have any questions for this option

Comparisons and Evaluation

a) Create a sequential code to solve the problem
b) Create two solutions using the two parallel programming frameworks as identified
c) Benchmark the three implementations (sequential code and implementations using two parallel programming frameworks)
d) Compare and analyze the performance (e.g., speedup, memory consumption, etc.) of your implementation
e) What do you learn in the project?

Submission

- Submit the source code of the three implementations
- Information expected in the final Report
  - Summarize your implementations, the challenges and the lessons you learned in the project
  - Comparisons and benchmark the solutions developed

Create an all-in-one zip file for all the source code, reports, and supporting documents for submission.

Important Dates

- Report 1 (5 points): due on Oct 31, 2022 by midnight
  - A brief introduction of the problem you identify
- Report 2 (15 points): due on Dec 7, 2022 by midnight
  - Source code and readme files
  - Final report