Lab 1

Dense Matrix Multiplication in C++ (Serial Implementation)

Please follow these steps to get a better idea on requesting and using HPC allocated resources to submit/execute jobs. This lab is focused on executing C++ programs using sbatch/srun.

1. Open Terminal and Login to WAVE HPC using SSH.
- ssh scu_username@login.wave.scu.edu
- create your password, if it's your first time.

2. After logging in, You will be logged into one of 3 login nodes of WAVE. Copy the Lab1 Folder to your user directory in HPC from your local machine.

3. Complete the MatrixMultiplication Logic in the DenseMatMul.cpp

4. After completing, You need to create your own shell script to execute the code.

Command: sbatch MatMulJob.sh (any name)

This Command will submit your job. If everything works well, You will get a notification on your email for job completion otherwise It would be Job failed. You can then use result.err to find and fix the error. Repeat step 4 if you have resolved the error.

5. You need to submit results.out or logfile to demonstrate your output file

6. You can then submit updated/completed DenseMatMul.cpp and results.out/logfile files on Camino.

Matrix Multiplication:

$$
\underbrace{\begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 2 \\ 3 & 2 & 1 \end{bmatrix}}_{\text{Mat 1}} \times \underbrace{\begin{bmatrix} 1 & 1 & 1 \\ 3 & 4 & 2 \\ 3 & 2 & 1 \end{bmatrix}}_{\text{Mat 2}} = \underbrace{\begin{bmatrix} 16 & 15 & 8 \\ 21 & 23 & 13 \\ 12 & 13 & 8 \end{bmatrix}}_{\text{output}}
$$