HPC4M Assignment 1 report

I attempted only exercise 2, which involved parallelising a matrix multiplication. I decided that, as the point of the exercise is to become more familiar with parallel programming and not implementing linear algebra in C++, to use the Eigen library to perform the linear algebra for me.

Implementation

I implemented the instructions in C++. For cases when the number of available processes is more than or equal to the number of rows in the matrix I idle the difference. I believe this to be the fastest possible method pedagogically speaking (my implementation is not the fastest however).

For cases when there are more rows than processes I split the work as evenly as possible. However I ran into problems when getting them all to communicate their work to the root process. This resulted in me using a sum routine, which made the implementation dreadfully slow as the routine is unaware that all but one row of the matrices it is summing are zero. However in the future I have been advised to have all processes carry out an even amount of work and to simply discard the work that is not required. I did not have time to implement this this time around, but will make sure to do so in the future.