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**Report – Assignment 3**

1: Original program **pmd.c** runs slower than the modified program **pmd\_mod.c.**

Pmd.c has a blocking MPI\_Send and MPI\_Recv that makes the program wait until the message is received and hence the delay in wait times and the program runs slower. This can also lead to a potential deadlock if the MPI\_Send and MPI\_Recv calls are not in correct order in the program

2: Pmd\_mod.c has a non blocking MPI\_Irecv call. This is an asynchronous call and does not block the program till the message is received and and processing continues saving some execution time. Along with this we use an MPI\_Wait call which waits for an MPI request to complete.

To test results, the program is run multiple times and the results of the 3 runs are as follows.

In each run, program **pmd.c** runs slower than **pmd\_mod.c**

|  |  |  |
| --- | --- | --- |
| **Run** | **pmd.c** | **pmd\_mod.c** |
| 1 | CPU & COMT = 6.399272e+00 4.273105e+00 | CPU & COMT = 5.915776e+00 3.740363e+00 |
| 2 | CPU & COMT = 5.595042e+00 3.351732e+00 | CPU & COMT = 4.995250e+00 2.715542e+00 |
| 3 | CPU & COMT = 5.614631e+00 3.341955e+00 | CPU & COMT = 4.982343e+00 2.698404e+00 |

Output files were collected for each of the runs for each of the program and the files are included in the submission as Run\_1, run\_2 and run\_3.