Lab 4 : Matrix Multiplication

	Member
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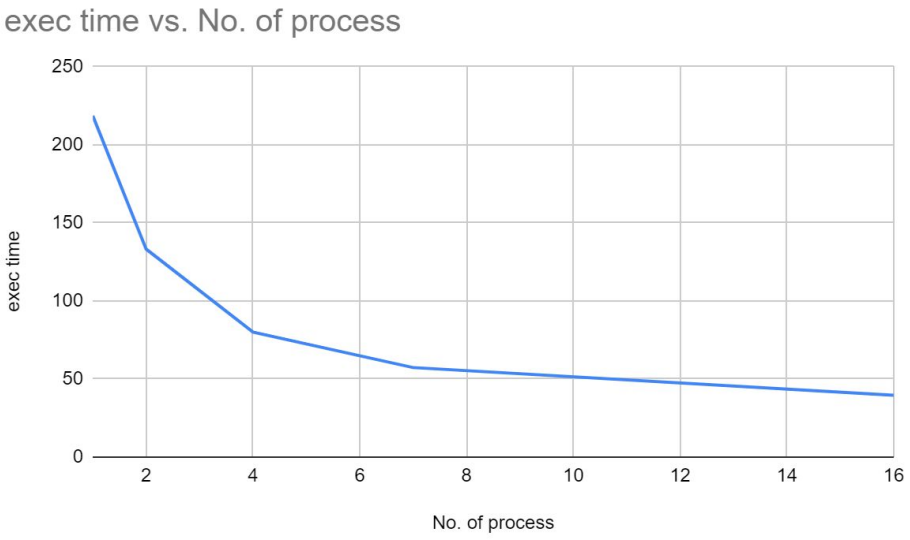


```
Compile Log:
cmd: timeout 100 mpirun -f mpi_host -n 16 ./60070503461 arrayAm.txt arrayBm.txt 60070503461_out
time: 39.578487123013474
stdout:
Output is correct
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cmd: timeout 150 mpirun -f mpi_host -n 7 ./60070503461 arrayAm.txt arrayBm.txt 60070503461_out
time: 57.34390253399033
stdout:
Output is correct
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cmd: timeout 200 mpirun -f mpi_host -n 4 ./60070503461 arrayAm.txt arrayBm.txt 60070503461_out
time: 80.0527186760155
stdout:
Output is correct
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cmd: timeout 250 mpirun -f mpi_host -n 2 ./60070503461 arrayAm.txt arrayBm.txt 60070503461_out
time: 133.19050386099843
stdout:
Output is correct
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cmd: timeout 400 mpirun -f mpi_host -n 1 ./60070503461 arrayAm.txt arrayBm.txt 60070503461_out
time: 218.6325270239904
stdout:
Output is correct
```

A technique used in this lab

1. Collective communication
   MPI_Scatter, MPI_Scatterv, MPI_Bcast, MPI_Gatherv
2. Parallel read file
   Using two processes to read the first matrix and the second matrix separately, then using collective communication for exchange matrix data to all processes.
3. Transpose Matrix
   Transpose matrix B to decrease the page fault when multiplication matrix.
4. Remove function
   Remove function to decrease the time when branch/jump
5. Decrease procedure in loop
   Decrease the procedure to decrease value and check condition in loop for example,
   for(int i = 0; i < max; i++)
   Change to
   For (int i = max; i--;)
6. Trying to decrease the same operation of calculation
   Create a new variable to keep the value after calculation to decrease the calculation oepration