

# MPI Assignment

## Report of Problem 2:

### Configuration:

No. of CPU: 8

Memory: 8 GB

Table 1: Comparison of performance of Polynomial evaluation using MPI where Data Size=50k, and Chunk Size=77

No of Processors	Parallel Time	Sequential	Speedup
4	3.766103	11.534026	3.0626
8	1.376371	9.648367	7.0100

Table 2: Comparison of performance of Polynomial evaluation using MPI where Data Size=100k, and Chunk Size=77

No of Processors	Parallel Time	Sequential	Speedup
4	15.376041	47.860284	3.112653
8	5.291778	29.473186	5.569618

## Screenshot

### Screenshot of program 1

```
[tjv7@mill-login-p1 MPI]$ mpirun -n 8 matrix_partition.c
[tjv7@mill-login-p1 MPI]$ sbatch matrix_mpibatchfile.script
sbatch: Warning: you are submitting a job the to the queue partition. There is a chance that your job will be preempted by priority partition jobs and have to start over from the beginning.
Submitted batch job 1321955
[tjv7@mill-login-p1 MPI]$ squeue -u tjv7w
JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)
1321955 request MPI_Matr tjv7w PD 0:00 1 (Priority)
1321805 rss-class sys/dash tjv7w R 1:37:35 1 compute-41-05
1321797 rss-class sys/dash tjv7w R 1:52:41 1 compute-41-05
[tjv7@mill-login-p1 MPI]$ ls
bash: ls: command not found
[tjv7@mill-login-p1 MPI]$ ls
broadcast.cpp ExerciseMPI.c Master_worker.c matrix matrix_mpibatchfile.script message.c Mill-1321812.out mpibatchfile.script paralleladd.cpp Poly-1321916.out Poly-1321946.out Poly-1321949.out polynomial.c test.c
huggy.c hellompi.cpp masterworker.script Matrix-1321955.out matrix_partition.c Mill-1321799.out Mill-1321825.out msg_pass.c Poly-1321884.out Poly-1321917.out Poly-1321947.out polynomial reduction.cpp
[tjv7@mill-login-p1 MPI]$ cat Matrix-1321955.out
sequential sum is 54
Sequential Execution time 0.000021
local Sum by rank = 0 is 7
global sum is 54
Parallel Execution time 0.000034
local Sum by rank = 1 is 7
local Sum by rank = 2 is 7
local Sum by rank = 3 is 7
local Sum by rank = 4 is 7
local Sum by rank = 5 is 7
local Sum by rank = 6 is 6
local Sum by rank = 7 is 6
[tjv7@mill-login-p1 MPI]$
```

### Screenshot of program 2

```

[tjv7w@mill-login-p1 ~]$ cd Desktop/PDR/MPI
[tjv7w@mill-login-p1 MPI]$ module load openmpi/4.1.5/gcc/12.2.0
[tjv7w@mill-login-p1 MPI]$ sbatch polynomial.script
sbatch: Warning: you are submitting a job the to the requeue partition. There is a chance that your job will be preempted by priority partition jobs and have to start over from the beginning.
Submitted batch job 1323260
[tjv7w@mill-login-p1 MPI]$ squeue -u tjv7w

```

JOBID	PARTITION	NAME	USER	ST	TIME	NODES	NODELIST(REASON)
1323260	requeue MPI_Poly		tjv7w	R	0:04	1	compute-15-07
1322467	rss-class sys/dash		tjv7w	R	2:52:26	1	compute-41-01

```

[tjv7w@mill-login-p1 MPI]$ ls
a.out      Matrix-1321985.out      Poly-1323260.out
broadcast.cpp  matrix_mpibatchfile.script polynomial
buggy.c      matrix_partition.c      polynomial.c
ExerciseMPI.c message1.c               polynomial.script
hellompi.cpp mpibatchfile.script     reduction.cpp
Master_worker.c msg_pass.c              test.c
matrix       parallelAdd.cpp
[tjv7w@mill-login-p1 MPI]$ cat Poly-1323260.out
Sequential Sum: 9932.637374
Sequential Execution time 9.648367
Worker 3 received termination signal
Worker 4 received termination signal
Worker 7 received termination signal
Worker 5 received termination signal
Worker 1 received termination signal
Worker 6 received termination signal
Worker 2 received termination signal
Final result of polynomial evaluation: 9932.64
Parallel Sum: 9932.637374
Parallel Execution time 1.376371
Correct: Parallel and Sequential Results Match
[tjv7w@mill-login-p1 MPI]$

```