

# CS546 Parallel and distributed Processing Programming Assignment Manual

This assignment is done in PThreads and MPI, run on Linux local machine and Jarvis Cluster. Here are the main programs to be executed:

1. Serlization.c
2. Pthreads.c
3. Mpi
  1. Mpifinal.c
  2. jay.sh

Execution:

These programs are run on linux Local Mahine and Jarvis Cluster.

## 1. Local Machine

### 1. Serlization.c

Compile with "gcc Serlization.c -o test" and run ./test 2000 2 outputfile.txt (2000 is the Matrix size, 2 is the random seed and outputfile.txt to store the output)

```
chiru@chiru:~/Desktop$ gcc ser.c -o test
chiru@chiru:~/Desktop$ ./test 2000 2 ser.txt
filename = ser.txt

Matrix dimension N = 2000.

Initializing...
```

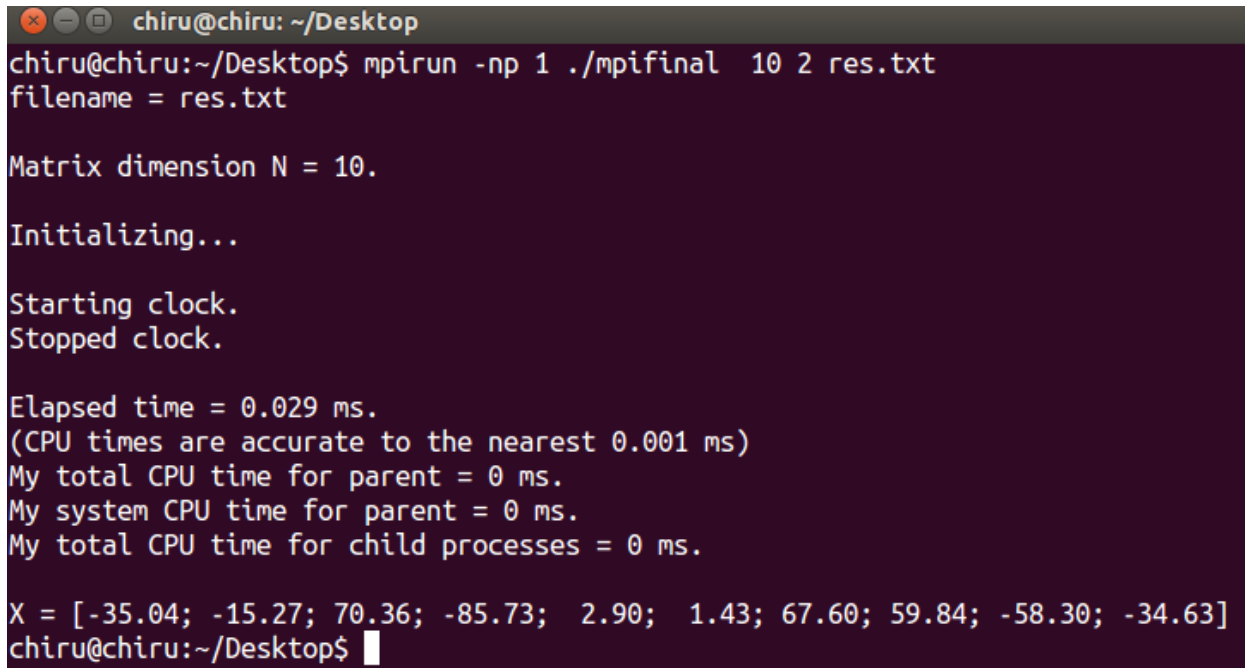
### 2. PThreads.c

Compile the code with "gcc PThreads.c -o test -lpthread" and run ./test 1000 2 Outputfile.txt (Here we need to give three command line arguments i.e Matrix size, random seed and output file name)

```
chiru@chiru:~/Desktop$ gcc PThreads.c -o test -lpthread
chiru@chiru:~/Desktop$ ./test 100 2 threadout.txt
filename = threadout.txt
```

### 3. Mpifinal.c

Compile the code with "mpicc mpifinal.c -o test1 -lm" and run "mpirun -np 1 ./test1 2000 2 output.txt" (Here we need to give three command line arguments i.e Matrix size, random seed and output file name).



```
chiru@chiru: ~/Desktop
chiru@chiru:~/Desktop$ mpirun -np 1 ./mpifinal 10 2 res.txt
filename = res.txt

Matrix dimension N = 10.

Initializing...

Starting clock.
Stopped clock.

Elapsed time = 0.029 ms.
(CPU times are accurate to the nearest 0.001 ms)
My total CPU time for parent = 0 ms.
My system CPU time for parent = 0 ms.
My total CPU time for child processes = 0 ms.

X = [-35.04; -15.27; 70.36; -85.73; 2.90; 1.43; 67.60; 59.84; -58.30; -34.63]
chiru@chiru:~/Desktop$
```

## 2.Jarvis Machine

### 1.Serlization.c

Compile with "gcc Serlization.c -o test" and run ./test 2000 2 outputfile.txt (2000 is the Matrix size, 2 is the random seed and outputfile.txt to store the output)

```
chiru1210@jarvis:~/SCode
chiru1210@jarvis:~/SCode x chiru@chiru: ~/Desktop
My total CPU time for child processes = 0 ms.
-----
[chiru1210@jarvis SCode]$ ./test 100 2 serfile1.txt
filename = serfile1.txt

Matrix dimension N = 100.

Initializing...

Starting clock.
Computing Serially.
Stopped clock.

Elapsed time = 3.893 ms.
(CPU times are accurate to the nearest 0.001 ms)
My total CPU time for parent = 0 ms.
My system CPU time for parent = 0 ms.
My total CPU time for child processes = 0 ms.
-----
[chiru1210@jarvis SCode]$
```

## 2. PThreads.c

Compile the code with "gcc PThreads.c -o Test -lpthread" and run ./Test 1000 2 Outputfile.txt (Here we need to give three command line arguments i.e Matrix size, random seed and output file name)

```
chiru1210@jarvis:~/SCode
[chiru1210@jarvis SCode]$ gcc PThreads.c -o test7 -lpthread
[chiru1210@jarvis SCode]$ ./test7 10 2 f3.txt
filename = f3.txt

Matrix dimension N = 10.

Initializing...

Starting clock.
Stopped clock.

X = [-1.37; 0.30; -0.48; -1.08; 0.88; 1.64; -0.24; 0.25; -0.15; 0.80]

Elapsed time = 5.034 ms.
(CPU times are accurate to the nearest 0.001 ms)
My total CPU time for parent = 0 ms.
My system CPU time for parent = 0 ms.
My total CPU time for child processes = 0 ms.
```

## 3. Mpifinal.c

Compile the code with "mpicc mpifinal.c -o mpifinal -lm" .

Job submission script contains(jay.sh) : mpirun -npernode 8 ./mpifinal 2000 2 output.txt (Here we need to give three command line arguments i.e Matrix size, random seed and output file name).

Run the above script as: qsub -cwd -pe mpich 4 jay.sh

Check the number of jobs submitted in the queue: qstat

Check the output by : cat jay.sh.16o91(16o91 is the job id of the particular job)

```
[chiru1210@jarvis SCode]$ vi jay.sh
[chiru1210@jarvis SCode]$ qsub -cwd -pe mpich 4 jay.sh
Your job 16490 ("jay.sh") has been submitted
[chiru1210@jarvis SCode]$ ls -l
total 260
-rw-r--r-- 1 chiru1210 iit_students 14007 Sep 26 17:47 f1.txt
-rw-r--r-- 1 chiru1210 iit_students 5607 Sep 26 17:49 f2.txt
-rw-r--r-- 1 chiru1210 iit_students 16996 Sep 26 18:00 f3.txt
-rw-r--r-- 1 chiru1210 iit_students 14007 Sep 27 14:58 file1.txt
-rwxr--r-- 1 chiru1210 iit_students 44 Sep 27 15:04 jay.sh
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 15:30 jay.sh.e16471
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 15:39 jay.sh.e16472
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 16:43 jay.sh.e16477
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 16:43 jay.sh.e16478
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 16:46 jay.sh.e16479
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 27 14:58 jay.sh.e16489
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 27 15:04 jay.sh.e16490
-rw-r--r-- 1 chiru1210 iit_students 4706 Sep 26 15:33 jay.sh.o16471
-rw-r--r-- 1 chiru1210 iit_students 2405 Sep 26 15:39 jay.sh.o16472
-rw-r--r-- 1 chiru1210 iit_students 1252 Sep 26 16:46 jay.sh.o16477
-rw-r--r-- 1 chiru1210 iit_students 677 Sep 26 16:45 jay.sh.o16478
-rw-r--r-- 1 chiru1210 iit_students 385 Sep 26 16:47 jay.sh.o16479
-rw-r--r-- 1 chiru1210 iit_students 383 Sep 27 14:58 jay.sh.o16489
-rw-r--r-- 1 chiru1210 iit_students 84 Sep 27 15:04 jay.sh.o16490
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 15:30 jay.sh.pe16471
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 15:39 jay.sh.pe16472
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 16:43 jay.sh.pe16477
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 16:43 jay.sh.pe16478
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 26 16:46 jay.sh.pe16479
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 27 14:58 jay.sh.pe16489
-rw-r--r-- 1 chiru1210 iit_students 0 Sep 27 15:04 jay.sh.pe16490
-rw-r--r-- 1 chiru1210 iit_students 121 Sep 26 15:30 jay.sh.po16471
-rw-r--r-- 1 chiru1210 iit_students 105 Sep 26 15:39 jay.sh.po16472
-rw-r--r-- 1 chiru1210 iit_students 153 Sep 26 16:43 jay.sh.po16477
-rw-r--r-- 1 chiru1210 iit_students 121 Sep 26 16:43 jay.sh.po16478
-rw-r--r-- 1 chiru1210 iit_students 105 Sep 26 16:46 jay.sh.po16479
-rw-r--r-- 1 chiru1210 iit_students 105 Sep 27 14:58 jay.sh.po16489
-rw-r--r-- 1 chiru1210 iit_students 153 Sep 27 15:04 jay.sh.po16490
```