Task1 -> Hello World

```
-bash-4.1$ whoami
tgupta5
-bash-4.1$ mpif90 -o hello_world_object_code hello_world.f90
-bash-4.1$ qsub -I -l nodes=2:ppn=4
qsub: waiting for job 9321.grape.soe.ucsc.edu to start
qsub: job 9321.grape.soe.ucsc.edu ready

-bash-4.1$ cd $PBS_O_WORKDIR
-bash-4.1$ mpirun -np 8 hello_world_object_code
 Hello! (From processor #           4  out of           8 )
 Hello! (From processor #           5  out of           8 )
 Hello! (From processor #           6  out of           8 )
 Hello! (From processor #           7  out of           8 )
 Hello! (From processor #           0  out of           8 )
 Hello! (From processor #           1  out of           8 )
 Hello! (From processor #           2  out of           8 )
 Hello! (From processor #           3  out of           8 )
-bash-4.1$ exit
logout

qsub: job 9321.grape.soe.ucsc.edu completed
-bash-4.1$ rm -f hello_world_object_code
```

Task2 -> Simple Send Recieve

```
-bash-4.1$ mpif90 -o ssr_object_code simple_send_recieve.f90
-bash-4.1$ qsub -I -l nodes=3:ppn=1
qsub: waiting for job 9360.grape.soe.ucsc.edu to start
qsub: job 9360.grape.soe.ucsc.edu ready

-bash-4.1$ cd $PBS_O_WORKDIR
-bash-4.1$ mpirun -np 3 ssr_object_code
 Processor           1  is sending data to processor           2


 Processor           2  is recieving data from processor           1


 Processor           2
 Currently, my array is:
          1           1           1           1           1           1           1           1           1           1


 Processor           2
 After recieving data, my array is:
          1           2           3           4           5           6           7           8           9          10


-bash-4.1$ exit
logout

qsub: job 9360.grape.soe.ucsc.edu completed
-bash-4.1$ rm -f ssr_object_code
```

Task3 -> Ping Pong

```
-bash-4.1$ whoami
tgupta5
-bash-4.1$ mpif90 -o ping_pong_object_code ping_pong.f90
-bash-4.1$ qsub -I -l nodes=2:ppn=1
qsub: waiting for job 9361.grape.soe.ucsc.edu to start
qsub: job 9361.grape.soe.ucsc.edu ready

-bash-4.1$ cd $PBS_O_WORKDIR
-bash-4.1$ mpirun -np 2 ping_pong_object_code
 I Ping just sent a message to pong!
 I Ping just got a message: 'This is message from Pong'
 I Pong just got a message: 'This is message from Ping'
 I Pong just sent a message to ping!
-bash-4.1$ exit
logout

qsub: job 9361.grape.soe.ucsc.edu completed
-bash-4.1$ rm -f ping_pong_object_code
```

Task5 -> Ring

```
-bash-4.1$ whoami
tgupta5
-bash-4.1$ mpif90 -o ring_object_code ring.f90
-bash-4.1$ qsub -I -l nodes=2:ppn=4
qsub: waiting for job 9335.grape.soe.ucsc.edu to start
qsub: job 9335.grape.soe.ucsc.edu ready

-bash-4.1$ cd $PBS_O_WORKDIR
-bash-4.1$ mpirun -np 8 ring_object_code
 Should I pass Left or Right? Enter '0' for Left or '1' for right:
1
 I, Processor           0  recieved message:           7  from processor           7
 I, Processor           1  recieved message:           0  from processor           0
 I, Processor           2  recieved message:           1  from processor           1
 I, Processor           3  recieved message:           2  from processor           2
 I, Processor           4  recieved message:           3  from processor           3
 I, Processor           5  recieved message:           4  from processor           4
 I, Processor           6  recieved message:           5  from processor           5
 I, Processor           7  recieved message:           6  from processor           6
-bash-4.1$ exit
logout

qsub: job 9335.grape.soe.ucsc.edu completed
-bash-4.1$ rm -f ring_object_code
```

Task6 -> Pi

```
[-bash-4.1$ whoami
tgupta5
[-bash-4.1$ mpif90 -o pi_object_code pi.f90
[-bash-4.1$ qsub -I -l nodes=8:ppn=1
qsub: waiting for job 9362.grape.soe.ucsc.edu to start
qsub: job 9362.grape.soe.ucsc.edu ready

[-bash-4.1$
[-bash-4.1$ cd $PBS_O_WORKDIR
[-bash-4.1$ mpirun -np 8 pi_object_code
 Processor            4  got      3926569  hits in the circle!
 Processor            0  got      3926605  hits in the circle!
 Processor            1  got      3928674  hits in the circle!
 Processor            2  got      3926499  hits in the circle!
 Processor            7  got      3925898  hits in the circle!
 Processor            5  got      3927116  hits in the circle!
 Processor            6  got      3927635  hits in the circle!
 Processor            3  got      3928296  hits in the circle!
 Approximation of Pi:    3.1417291
[-bash-4.1$ exit
logout

qsub: job 9362.grape.soe.ucsc.edu completed
[-bash-4.1$ rm -f pi_object_code
```