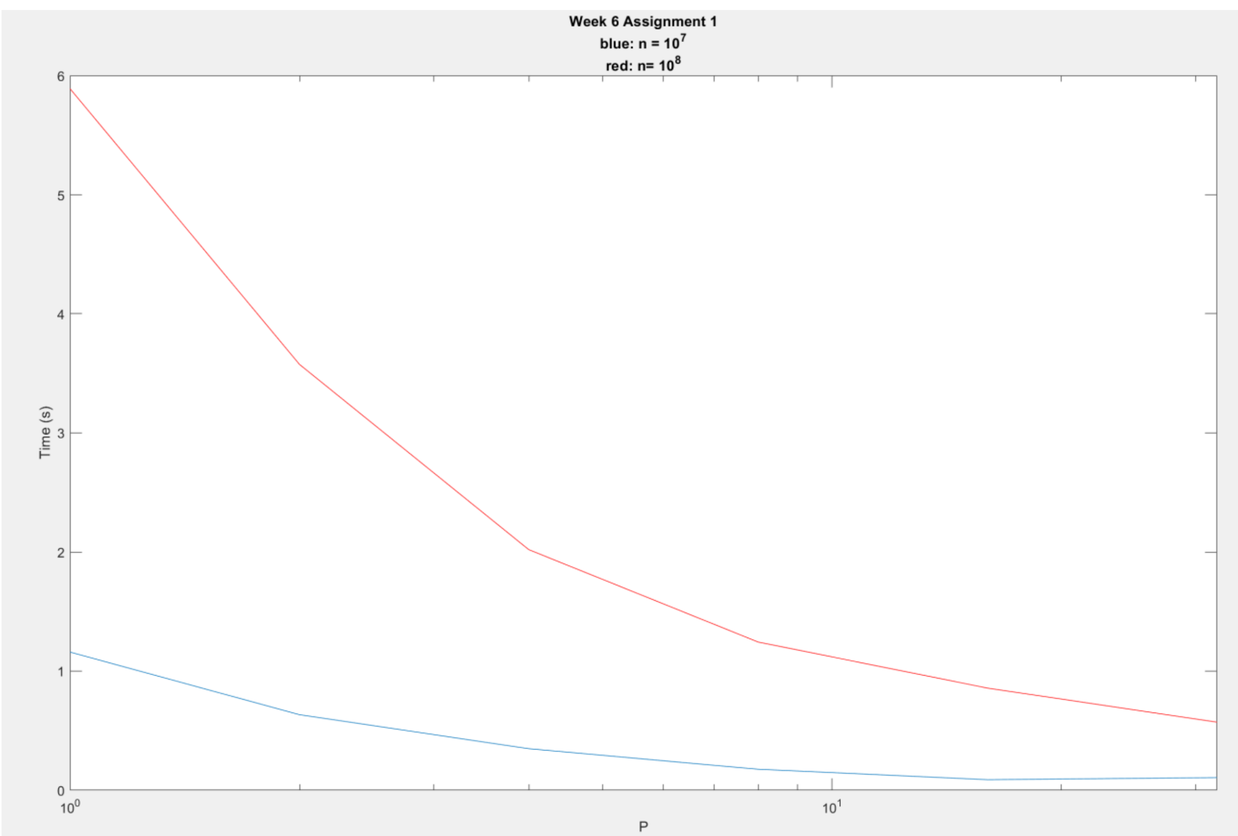
```
[robert.campbell@apex wk6]$ cat pi_mc_mpi.out
    npoints            pi        nprocs          elapsed wall-clock time
   10000000        3.1418             1                          1.15979
    npoints            pi        nprocs          elapsed wall-clock time
   10000000        3.1414             2                         0.634331
    npoints            pi        nprocs          elapsed wall-clock time
   10000000       3.14148             4                         0.348533
    npoints            pi        nprocs          elapsed wall-clock time
   10000000       3.14205             8                         0.176174
    npoints            pi        nprocs          elapsed wall-clock time
   10000000        3.1419            16                        0.0885261
    npoints            pi        nprocs          elapsed wall-clock time
   10000000       3.14146            32                         0.105811
```

```
[robert.campbell@apex wk6]$ cat pi_mc_mpi.out
    npoints            pi        nprocs          elapsed wall-clock time
  100000000       3.14156             1                          5.88974
    npoints            pi        nprocs          elapsed wall-clock time
  100000000       3.14137             2                          3.57555
    npoints            pi        nprocs          elapsed wall-clock time
  100000000       3.14158             4                          2.01964
    npoints            pi        nprocs          elapsed wall-clock time
  100000000       3.14151             8                          1.24406
    npoints            pi        nprocs          elapsed wall-clock time
  100000000       3.14176            16                         0.857434
    npoints            pi        nprocs          elapsed wall-clock time
  100000000       3.14177            32                         0.571592
```



Both data sets saw massive improvements with diminishing returns as additional threads were added, with n=100,000,000 having benefitting more for each additional thread. One thing to notice is that the smaller sample size was less precise in it's result, with the 3rd decimal place fluctuating from the correct value while the larger sample size fluctuated around the 4th decimal place. As far as this lab goes, it looks like 1 additional order of magnitude of samples added an order of magnitude of precision in the result, however it did noticeably increase serial runtime (~6x). If a more precise answer is needed, even more samples would be required, which would benefit even more from parallelization.