

Assignment 5

Write a C+MPI program to do simulate forest-fire in parallel.

Your goal is to process this graph and o/p forest-state; note: the output must MATCH EXACTLY that of the serial algorithm.

Download the two files `firestart.c`, and `parallel.c` from <http://www.cse.iitm.ac.in/~krishna/cs6868/P5/firestart.tgz>. You are required to use the `P5.c`, and add your code only in `parallel.c`.

The program (main file name - `P5.c`) should take four inputs: three integers: `forestSize`, `numTrials`, `numProbabilities` and options specifying if the program is to be run in serial or parallel.

```
$ mpirun -np 4 ./P5 20 201 11 -parallel
Probability of fire spreading, Average percent burned
0.000000 , 0.000000
0.100000 , 0.001633
0.200000 , 0.004264
0.300000 , 0.013304
0.400000 , 0.057856
0.500000 , 0.363147
0.600000 , 0.832030
0.700000 , 0.956196
0.800000 , 0.985711
0.900000 , 0.999551
1.000000 , 1.000000
elapsed time = 0.125311 seconds
```

Notes: 1) The Exact time taken to compute may vary from user to user. 2) We will test the program for varying number of processes and see (i) the correct o/p is generated all the times, (ii) how it scales, (iii) the approach you have used to parallelize (submit it in a `README-P5.txt` file in the submission), (iv) overall performance [35 + 35 + 20 + 10].