**PercolationDFSFast**

simulation data for 20 trials

grid mean stddev total time

100 0.593 0.014 0.081

200 0.591 0.010 0.096

400 0.590 0.006 0.569

800 0.594 0.004 4.100

Exception in thread "main" java.lang.StackOverflowError

at PercolationDFS.dfs(PercolationDFS.java:108)

{…}

**PercolationBFS**

simulation data for 20 trials

grid mean stddev total time

100 0.593 0.014 0.060

200 0.591 0.010 0.090

400 0.590 0.006 0.636

800 0.594 0.004 3.827

1600 0.592 0.002 23.172

3200 0.593 0.001 142.386

Process finished with exit code 0

**PercolationUF (10 trials)**

simulation data for 10 trials

grid mean stddev total time

100 0.593 0.019 0.034

200 0.596 0.006 0.051

400 0.592 0.006 0.166

800 0.592 0.003 1.435

1600 0.594 0.002 6.454

3200 0.593 0.001 32.054

Process finished with exit code 0

**PercolationUF (20 trials)**

simulation data for 20 trials

grid mean stddev total time

100 0.593 0.014 0.058

200 0.591 0.010 0.067

400 0.590 0.006 0.465

800 0.594 0.004 2.895

1600 0.592 0.002 13.811

3200 0.593 0.001 64.772

Process finished with exit code 0

1. How does doubling the grid size affect running time (keeping # trials fixed)

For almost all the doublings (except from grid=100 to grid=200), the runtimes multiply by ~5.

1. How does doubling the number of trials affect running time.

For almost all the doublings (except grid=200), doubling the number of trials, doubles the runtime.

1. Estimate the largest grid size you can run in 24 hours with 20 trials. Explain your reasoning.

In 24 hours, there are 86400 seconds. If we extend the 5x multiply for every grid size doubling data, we’d see something like this:

Grid size-runtime

100-.058

200-.067

400-.465

800-2.895

1600-13.911

3200-64.722

6400-324

12800-1618

25600-8090

51200-40451

102400-202256

Thus, the runtime would be expected to between 40451 and 202256, closer to 202256. We can reasonably expect by this estimation that the largest grid size would be equal to 51200 since a grid size of 102400 would be reached after 24 hours.