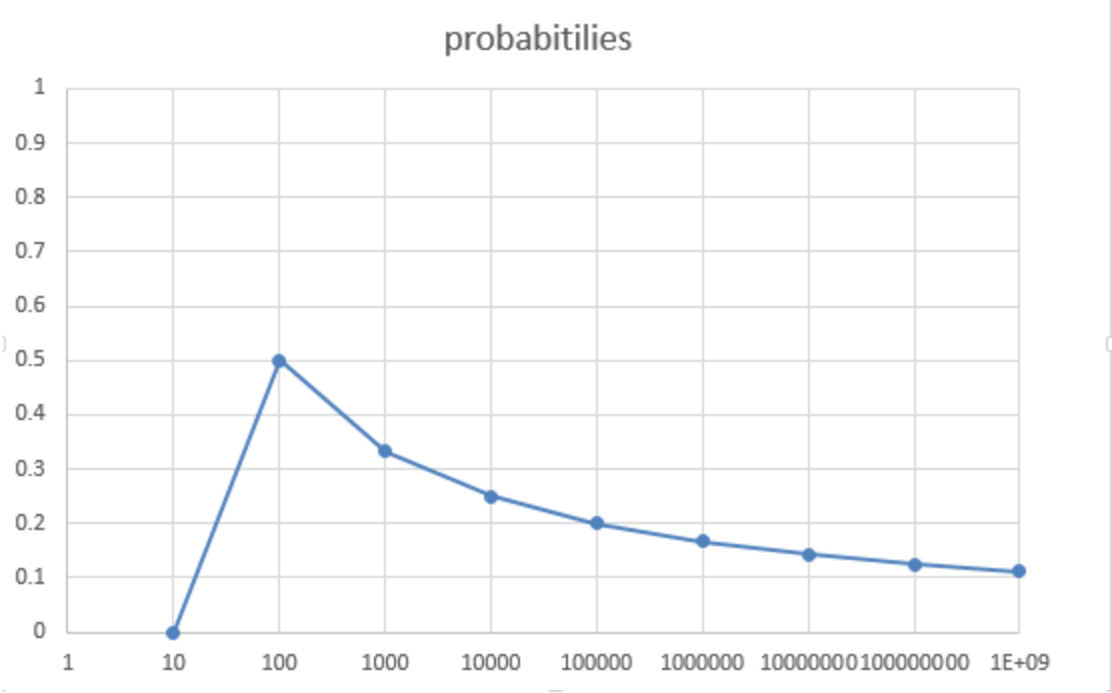
Lab 05

E/14/049

Task 3: “Suppose you have a 20x20 maze (where (0,0) and (19,19) is not blocked) probabilistically populated – each square is equally likely to be blocked or be free. What is the probability that you will have a path from (0,0) to (19,19)?”. Formulate an answer for this question. Hint: Mote Carlo Simulations.

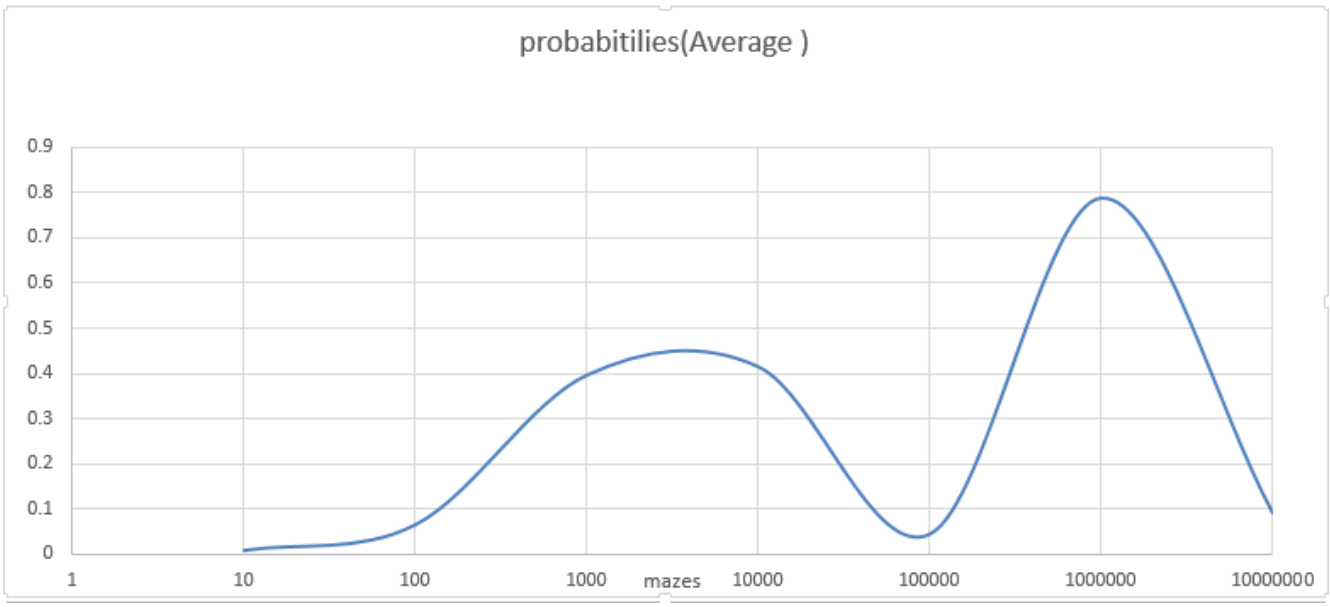
i) First I try to find the number of mases which are having paths from (0,0) to (19,19) for different sets of mazes.(10,100,1000,10000,100000,1000000,10000000,100000000).then I calculate the probability of getting a path for a random maze.

```
user@PC MINGW64 /f/hard/sem 5/co 322/lab 5/mine/exercise 3
$ java Maze
probability (out of 10 mazes.):0.0%
probability (out of 100 mazes.):0.5%
probability (out of 1000 mazes.):0.33333334%
probability (out of 10000 mazes.):0.25%
probability (out of 100000 mazes.):0.2%
probability (out of 1000000 mazes.):0.16666667%
probability (out of 10000000 mazes.):0.14285715%
probability (out of 100000000 mazes.):0.125%
probability (out of 1000000000 mazes.):0.11111111%
```



ii) Then I do the same thing for sample set to get a better result. Out of 10 sample got the mean value of the probabilities.

```
user@PC MINGW64 /f/hard/sem 5/co 322/lab 5/mine/exercise 3
$ java Maze
Average probability (out of 10 mazes & 10 samples):0.01%
Average probability (out of 100 mazes & 10 samples):0.06687714%
Average probability (out of 1000 mazes & 10 samples):0.03972475%
Average probability (out of 10000 mazes & 10 samples):0.041531753%
Average probability (out of 100000 mazes & 10 samples):0.04613246%
Average probability (out of 1000000 mazes & 10 samples):0.07881202%
Average probability (out of 10000000 mazes & 10 samples):0.091779806%
Average probability (out of 100000000 mazes & 10 samples):0.09284976%
Average probability (out of 1000000000 mazes & 10 samples):0.08196393%
```


probabitilies(Average)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1
10
100
1000
mazes
10000
100000
1000000
10000000