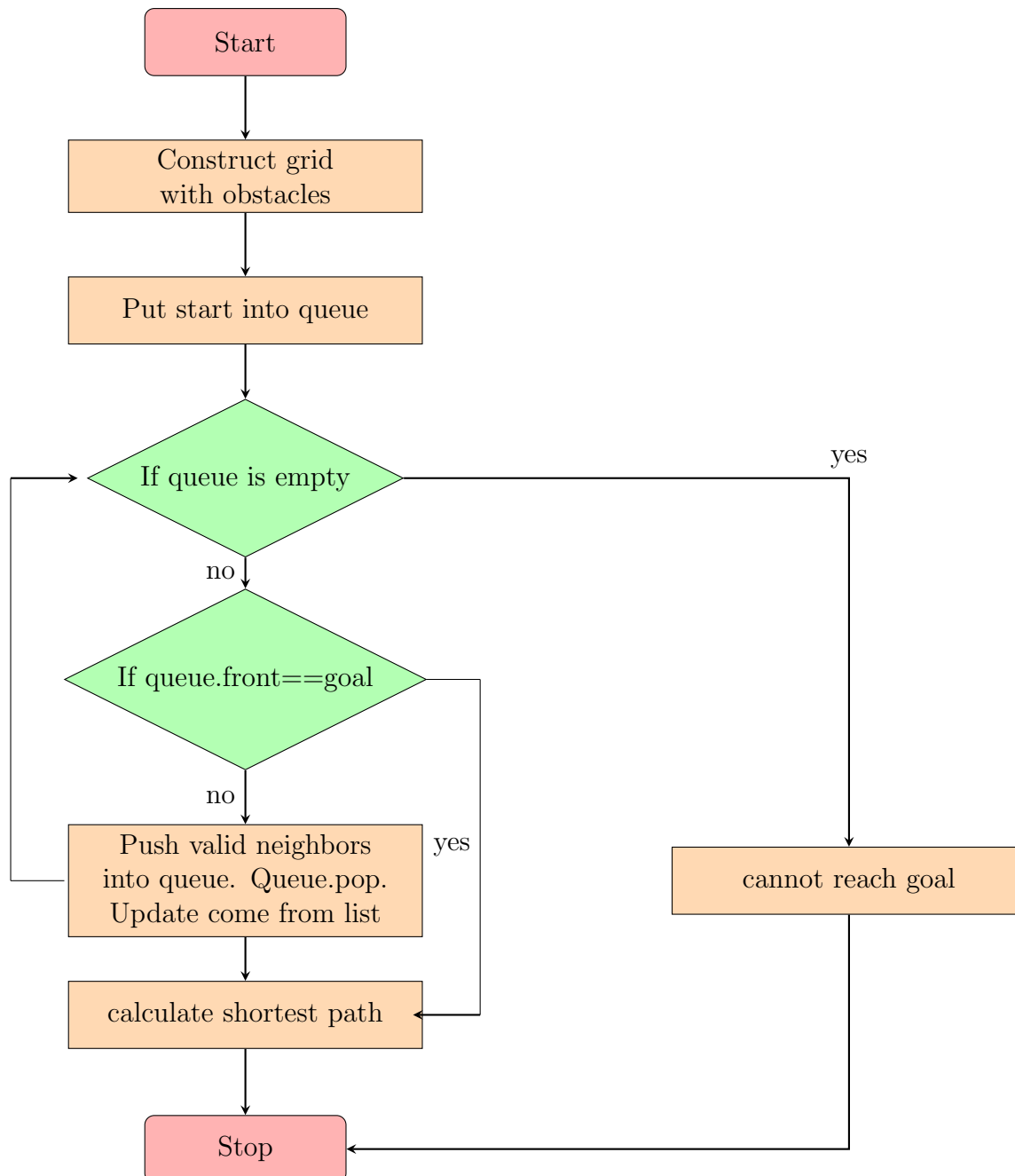


## Problem 1

The problem is to simulate a 2D space with obstacles and free space (4 connect grid). Run the search algorithm to find the shortest path. Since BFS can guarantee the shortest path but DFS cannot. I will choose BFS and the flow-diagram of search algorithm is as follows.



I choose grid size 30-by-30. Starting point is the left top corner. Goal point is the right bottom corner. There are three configurations shown as following. The red line is the shortest path

2

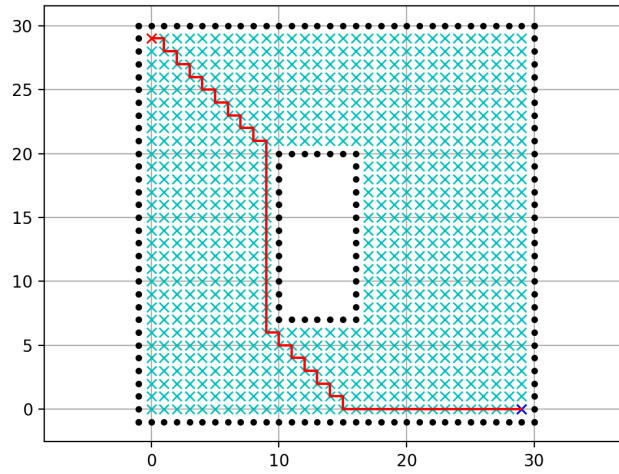


Figure 3: configuration 3

BFS	config1	config2	config3
cost(steps)	59	59	59
running time(s)	0.01118	0.01173	0.0078