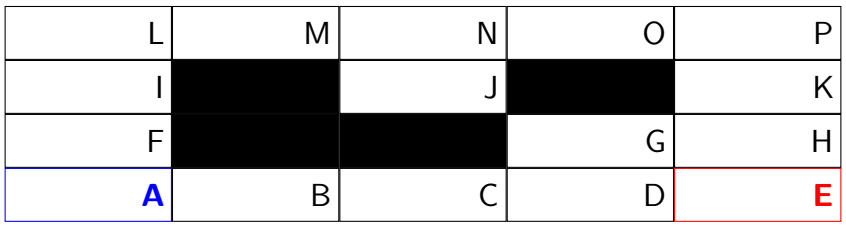
In-class Activity

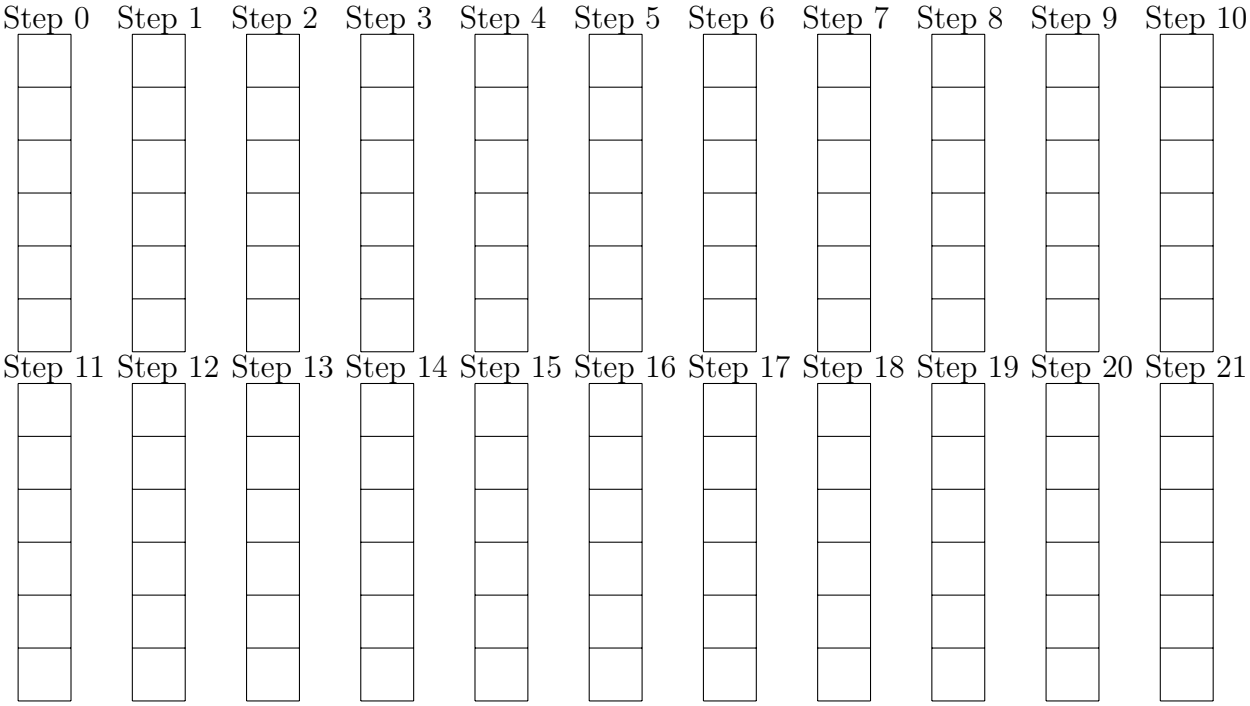
ME 570 - Prof. Tron

2023-10-31

Problem 1: Depth-First Search

Question 1.1. Consider the discretized environment in the figure below, with a four-connected neighborhood. Manually run the DFS algorithm from the start location **A** to the end location **E**. For each step, keep track of the content of the stack in the provided diagram. For each node, the neighbors should be considered in the order *down, right, up, left*. As you proceed, mark the cells in the figure with an arrow for the backpointer, and a number for the backpointer cost.

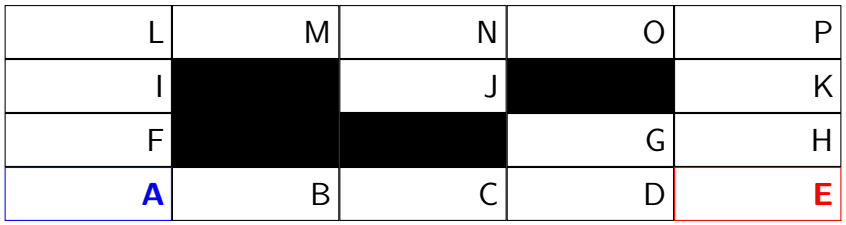


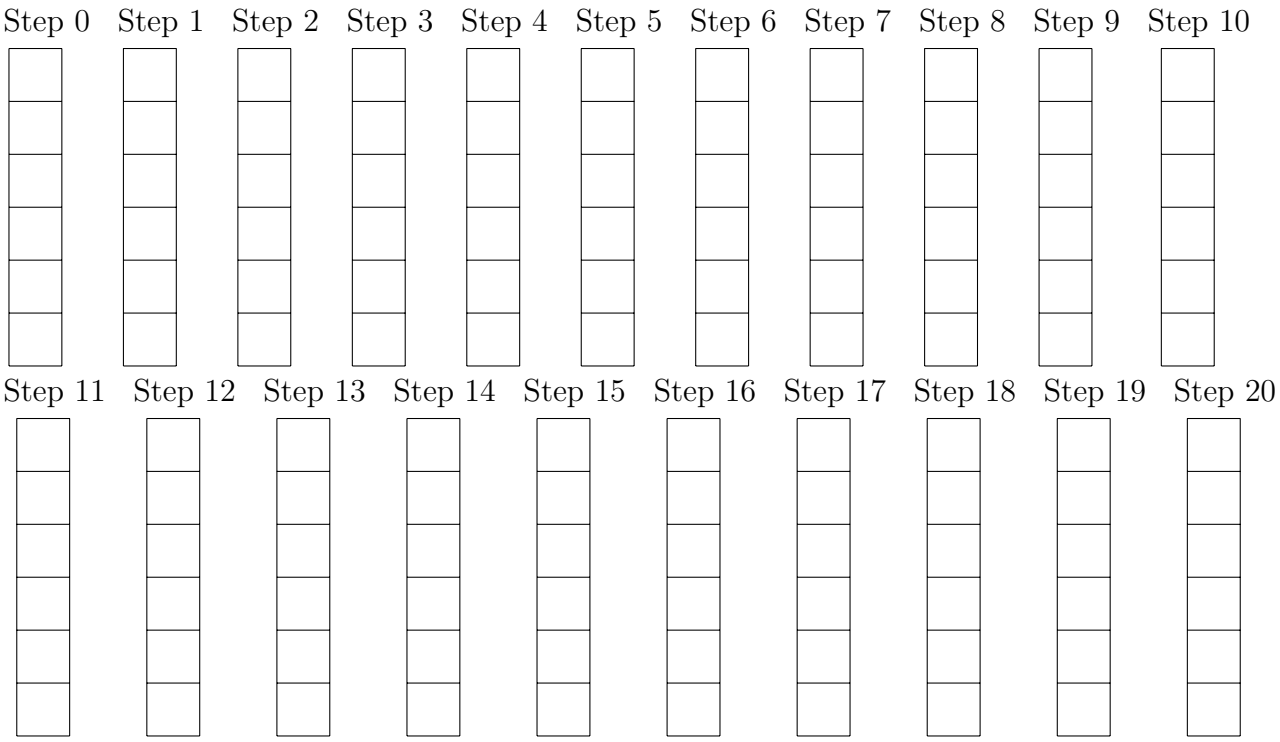


Question 1.2. Give the sequence of letters corresponding to the path found from A to E.

Problem 2: Breadth-First Search

Question 2.1. Repeat question 1.1, but using BFS.





Question 2.2. Give the sequence of letters corresponding to the path found from A to E.

Problem 3: A star (A*)

Question optional 3.1. Find the path from node **A** to node O using an 8-connected neighborhood.

L 4.0	M 3.0	N 2.0		O 0.0
I 4.12		J 2.24		K 1.0
F 4.47			G 2.24	H 2.0
A 5.0	B 4.24	C 3.61	D 3.16	E 3.0

Step 0 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9 Step 10

Step 11 Step 12 Step 13 Step 14 Step 15 Step 16 Step 17 Step 18 Step 19