Subject: Data Structures and its Applications

Code: UE20CS202

Assignment 2

In the given assignment we are supposed to find the path from source to destination using 2 different search methods. Unlike the previous assignment, this time we save the layout matrix in the form of adjacency list for graph.

Before we create the adjacency list, we call the findRows() function. This function returns the number of rows present in the layout matrix. This is essential to make the adjacency list. Now the source() function determine the source coordinates. This too is needed for further call of functions. Now using the readGraph() function we determine the adjacency list for the graph. Inside readGraph() function we call the insGraph() function which places the node in its respective list in the adjacency list.

Now that we have created our adjacency list we move on to findPath() function. This function is responsible for find the path from source to destination. Now we have 2 traversal search methods, Depth-first search and Breadth-first search.

In this depth first search, weexplore the depth of the node first and then move to the neighbor nodeand repeat the same. In breadth first search, we traverse throughthe neighbornodes and then check each neighbor'sbreadth i.e. repeatthe same pattern for next node.

In the given assignment we observe that at several points there are two paths available to reach the same destination coordinates.DFS will give preference to down over right. On the contrary, BFS i.e. Breadth first search will give preference to right over down. Here right and down represent possible moves from a particular node.

If path exists the storePath() function will store the coordinates from the DFS and BFS method in files outdfs.txt and outbfs.txt respectively. If path doesn't exist, -1 is stored. It is important to know that there is no case where we find path using only one method. Both search methods will always return the path if at all it exists.