Assignment 4: Writeup

This assignment focuses on using graphs to find the fastest path in a maze.
In this assignment, I used a 3D array to hold the ASCII character which were then translated into a graph using a linked list. Firstly, a node class
was created for the graph which inlcuded the row, column and depth coordinates and varaibles for the path followed and the cost to reach the end from the starting
point. A queue was initialized and a node was added to it. As we went down the queue, the neighbours were added which were the different directions that path
could have lead to. First of all, a boolean matrix was initiaized which kept track of all the nodes that were visited. This was then used to determine the location of
the 'S' in the grid. The breadth first search algorithm was used for path-finding in this assigment. When the queue is initialized, the nodes in the grid
with r = row, c= column, d = depth. We use the boolea matrix to see if the node has been visited, if yes then we continue and if no we say that it has been visited now.
To add the node for 'North', we check if it has been visited and if moving north will not run us into a wall. Then, we add the approprate cost and path indicator on the node.
We do a similar process for East, West, South, Up and Down. If the node is the exit point than we return the node and finally, if there is no path possible, we return null.
Finally, we test the algorithm, by using 5 different cases for the 5 different options in the menu.