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Task - 1(a)

Here in this code, I take two variables n and m which are the node and edge of a graph. Then in the code, it reads m lines, each containing (a, b, c) edge, where a, and b are nodes connected by an edge with weight 'c'. Then I create a adjacency matrix 'mat' for the graph where mat [a] [b] contains the weight of the edge from node a to node b and give the matrix as output.

Task (1.(b))

Here in this task, I take a input file where node and edges ~~and weight of~~ a graph are given. Then this code take this input and gives us a output as a adjacency list. The adjacency list is a dictionary where each key represents a node and its value is a tuple containing the adjacent nodes and their corresponding edge weights.

Task-2

To travel the Path BFS is the right choice. So in this task I used bfs using the algorithm that, given in the question. Then I take a input which is converted to adjacent list then it starts BFS traversal to from node 1. During this traversal it conects the visited nods into an output file. and we get our desired output.

Task - 3

In this task we are asked if we can do DFS or not. So, By taking an input we find the number of vertices 'n' and number of edges 'm' and the edges themselves. ~~It the~~ By using DFS traversal, by using color identification method ~~we I~~ find the traversal path as the output.

Task - 4

In this task in order to find cycle I took a input file. Then I made a adjacency list and append the elements in such a way that it only work for directed graph. Then I mark 2 color. By using DFS and using two color we I find if the graph is Bipartide or not. If Bipartide exist then output is yes or else No.

Task - 5

In this task We have to find the Shortest Path and times of traversal. So I applied BFS. So firstly I take a input when ~~we~~ I find a ~~vertices~~ node, ~~edge~~ ~~and~~ edge and destination. After that I made an adjucent list for undirected graph. after that I used BFS when is kept a count of Path traversal and find the Shortest Path and print them both as the output

Task - 6

In this task I used BFS to find the desired Output. Here I built a logic from the view of the question. Like other Places limitation to move, like this, the secret for diamond is being completed after dealing with certain conditions. Then I looked left and right and up ac down and marked the visited position are marked as block. Then every single possible path are checked to get the max amount of diamond. And in this way I get the desired output.