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| **WEEK-12** | **GRAPH AND ITS APPLICATIONS** |
| **LAB B** | **27-29 OCT 22** |
| Q1. Write a function to input and print an undirected graph for “v” vertices.  Q2. Write a program to store the graph data structure on an adjacency list and perform the  following operations:  a. To traverse the graph in depth-first search (DFS) manner  b. To traverse the graph in breadth-first search (BFS) manner  c. To check whether given two graphs are isomorphic or not  d. To find the Hamiltonian path for the given graph  Q3. Write a function to input a directed graph using adjacency matrix. Perform the following by writing individual functions for the same:  (i) Find the in-degree of a particular node.  (ii) Find the out-degree of a particular node.  (iii) Find the node with the maximum in-degree.  (iv) Find the node with the minimum in-degree.  (v) Find the degree of a given node.  (vi) Find if a graph has a cycle in it.  (vii) Find a path from a given source node/ vertex to a destination source node/vertex.  Q4. Solve 8-puzzle problem using BFS, DFS, A\* Algorithm & best-first search. The initial and the goal states are given below:    Q5. Write a program to store the graph data structure on an adjacency list and perform the  following operations:  a.. To find the shortest path using Dijkstra algorithm  b. To find the minimum spanning tree of the given graph using Kruskal‟s algorithm.  Q6. Write a function to input a weighted graph. Further, write functions to:  (i) Find a path from a given source node/ vertex to a destination source node/vertex and give its total cost / weight.  (ii) Find all the paths from a given source node/ vertex to a destination sourcenode/vertex and find the individual weights of each path.  (iii) Find the shortest path from a given source to a destination node/vertex and findthe weight of this path.  (iv) Find if a graph has a cycle in it. | |