



Assignment : Graphs 1

Q1 For a graph with n nodes, how many edges are there in a complete graph?

Q2 Minimum number of edges to make a graph on n nodes is?

Q3 Minimum number of edges to make a connected graph of n nodes?

Q4 Insertion and deletion of edges is fastest in ___ ?

Q5 Which representation should be used if we have a graph with a large number of nodes (>108) but with a few edges between them?

Q6 Can `adjacencyMatrix[i][j] != adjacencyMatrix[j][i]` in any case? If yes, what would be the type of graph called?

Q7 For a graph with n nodes, how many edges are there in a complete graph?

Q8 Minimum number of edges to make a graph on n nodes is?

Q9 Minimum number of edges to make a connected graph of n nodes?

Q10 Given the following adjacency list for an undirected graph:

```
[  
  [1, 2],  
  [0, 3],  
  [0, 3],  
  [1, 2]  
]
```

What are the adjacent vertices of vertex 1?

Q11 Given the following adjacency matrix for a directed graph:

$\begin{bmatrix} 0 & 1 & 0 & 0 \end{bmatrix},$

$\begin{bmatrix} 0 & 0 & 1 & 0 \end{bmatrix},$

$\begin{bmatrix} 0 & 0 & 0 & 1 \end{bmatrix},$

$\begin{bmatrix} 0 & 0 & 0 & 0 \end{bmatrix}$

What is the indegree of vertex 3?

Q12 Consider a directed graph with 4 nodes (1, 2, 3, 4) and the following edges: (1→2), (2→3), (3→4), (4→1). Represent this graph using an Edge List.

Q13 What is the maximum number of edges in a simple undirected graph with n nodes?

Q14 What is the minimum number of edges in a simple undirected connected graph with n nodes?

Q15 What is the minimum number of colors needed to color the nodes of a graph such that no two adjacent nodes have the same color?

Q16 What is the minimum cut of a graph?

Q17 What is the minimum number of nodes required to create a cycle in a directed graph?

Q18 What is the degree of a vertex in a graph?

Q19 Consider a graph with 5 nodes, A, B, C, D, and E. The following edges are present in the graph:

A → B

B → C

C → D

D → E

E → A

What is the degree of vertex C?

Q20 What is the time complexity of finding the minimum spanning tree of a graph using Prim's algorithm? Complete graph with 6 vertices to make it a tree?

Q21 In a complete graph, what is the sum of the degrees of all the vertices?

Q22 If a graph has 10 vertices and 25 edges, is it a tree?

Q23 How many edges can be removed from a complete graph with 6 vertices to make it a tree?

Q24 How many vertices are there in a graph with 12 edges and a maximum degree of 4?

Q25 What is the diameter of a complete graph with 10 vertices?

Q26 In a simple graph with 4 vertices and 3 edges, is there a cycle?

