

Write-up	Correctness of Program	Documentation of Program	Viva	Timely Completion	Total	Dated Sign of Subject Teacher
2	2	2	2	2	10	

Assignment No. 07

Date of Performance:

AIM: Represent any real world graph using adjacency list /adjacency matrix find minimum spanning tree using Kruskal's algorithm.

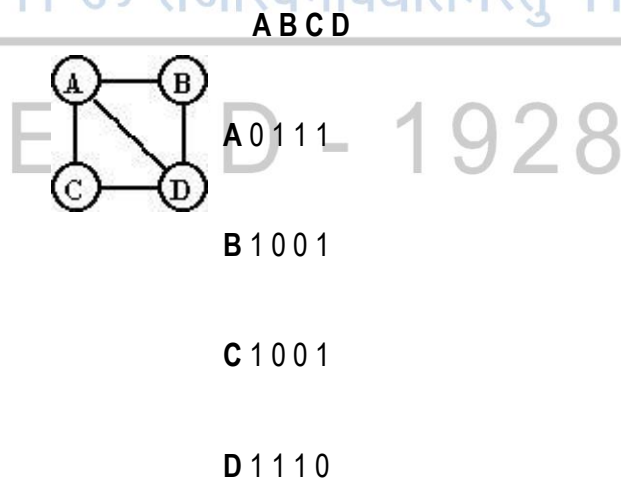
OBJECTIVE:

1. Learn the concepts of graph as a data structure and their applications in everyday life.
2. Understand graph representation (adjacency matrix, adjacency list, adjacency multi list)

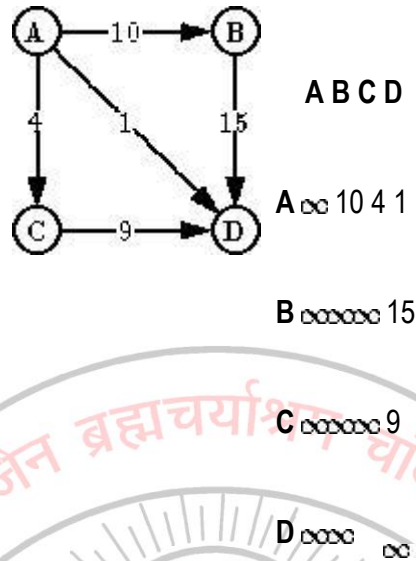
THEORY:

Different representations of graph.

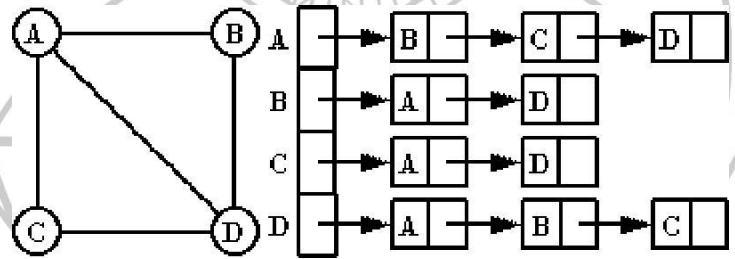
- **Adjacency matrix:** Graphs $G = (V, E)$ can be represented by adjacency matrices $G [V_1..V_{|V|}, V_1..V_{|V|}]$, where the rows and columns are indexed by the nodes, and the entries $G [v_i, v_j]$ represent the edges. In the case of unlabeled graphs, the entries are just Boolean values.



In case of labeled graphs, the labels themselves may be introduced into the entries.



- **Adjacency List:** A representation of the graph consisting of a list of nodes, with each node containing a list of its neighboring nodes.



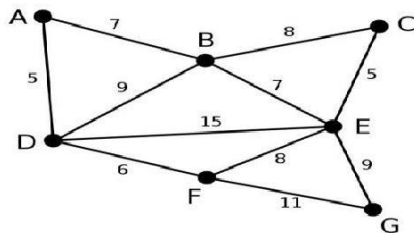
Kruskal's Algorithm:

- Step 1: Choose the arc of least weight.
- Step 2: Choose from those arcs remaining the arc of least weight which does not form a cycle with already chosen arcs. (If there are several such arcs, choose one arbitrarily.)
- Step 3: Repeat Step 2 until $n - 1$ arcs have been chosen.

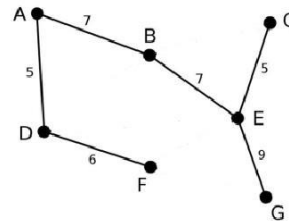
INPUT: Enter the no. of nodes in graph. Create the adjacency LIST

OUTPUT: Display result of each operation with error checking.

INPUT



OUTPUT

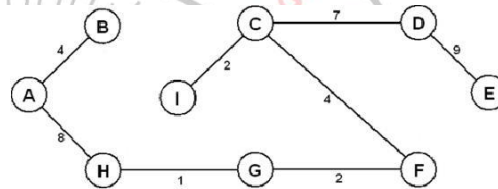
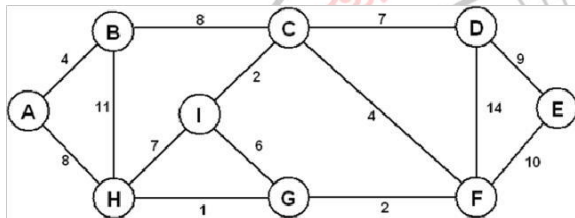


Remark

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OUTCOME: After successful implementation of this assignment, we understood the concept of adjacency list /adjacency matrix and we are able to find minimum spanning tree using Kruskal's algorithm.

FAQS:

1. What is graph? Which are various terminologies. Explain in brief.
2. Application of Prim's & Kruskal's algorithm.
3. What are the traversal techniques?
4. What are the graph representation techniques?
5. What is adjacency Multi-list?
6. Time complexity of Kruskal & Prims in all cases (Best, Average, Worst).