E/16/388

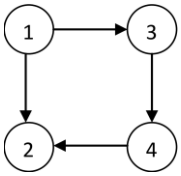
CO322 Data Structures and Algorithms - Graph ADT

Answers

1. Find out what is the Transitive Closure of a graph.

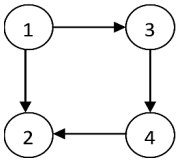
Given a directed graph G, in transtitive closure G*, from node v to node w there is an edge if and only if there is a directed path from v to w in G.

2. Manually compute the Transitive Closure for the following graph:



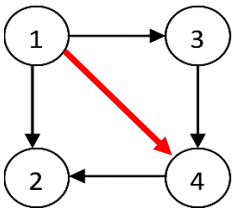
Adjacency matrix of graph

0	1	1	0
0	0	0	0
0	0	0	1
0	1	0	0



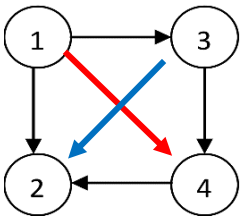
Adjacency matrix of graph using 1 or/and 2 nodes as intermediary nodes

0	1	1	0
0	0	0	0
0	0	0	1
0	1	0	0



Adjacency matrix of graph using 1 , 2 and/or 3 nodes as intermediary nodes

0	1	1	1
0	0	0	0
0	0	0	1
0	1	0	0

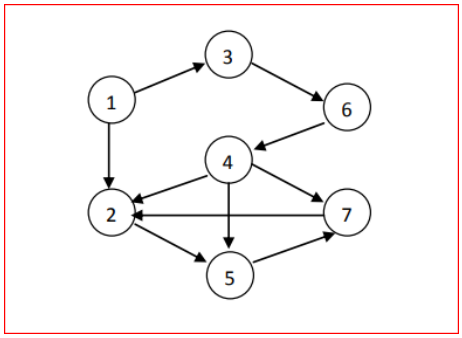


Adjacency matrix of graph using 1 , 2, 3 and/or 4 nodes as intermediary nodes

0	1	1	1
0	0	0	0
0	1	0	1
0	1	0	0

This is the transtitive closure of given graph.

3. Based on the Graph Traversal algorithm discussed in the class, write a C program to compute and print the Transitive Closure of a given graph. Use the following graph to test your program:



This was implemented in lab5.c file

```
Your input is:

0 1 1 0 0 0 0
0 0 0 0 1 0 0
0 0 0 0 0 1 0
0 1 0 0 1 0 1
0 0 0 0 0 0 1
0 0 0 1 0 0 0
0 1 0 0 0 0 0


Transitive closure of the graph

0 1 1 1 1 1 1
0 1 0 0 1 0 1
0 1 0 1 1 1 1
0 1 0 0 1 0 1
0 1 0 0 1 0 1
0 1 0 1 1 0 1
0 1 0 0 1 0 1
```