Indian Institute of Technology, Jodhpur

Bridge Course on DSA

(Session: 2022-23)

Assignment 2

Instructions:

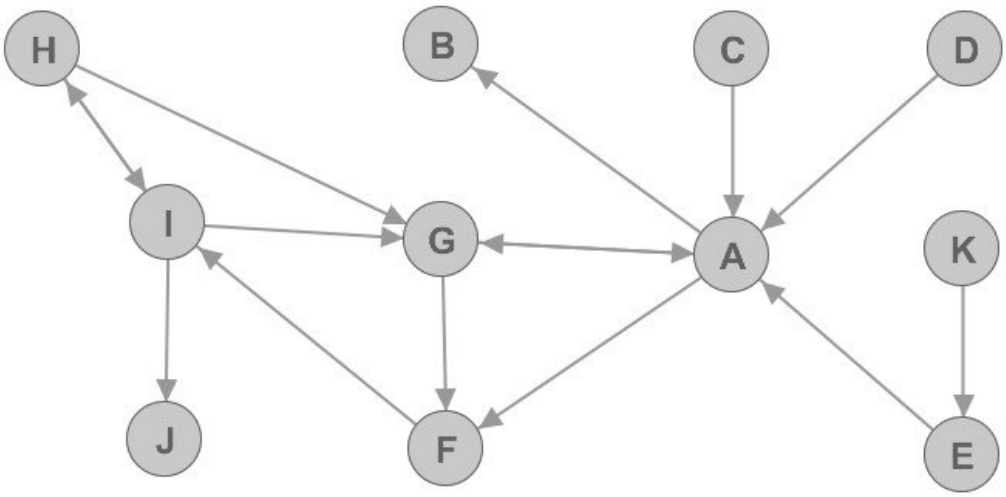
- The score points are assigned to the respective question
- You are required to attempt all the questions
- Answers need to be succinct and in your own words
- Verbosity is undesirable
- Please submit the solution within the provided deadline
- Plagiarism will not be tolerated. If plagiarism is detected, zero marks will be awarded for the entire assignment.

Section 1:

1. Write a program to implement a max or min (any one) heap with insert and delete functions.
2. Write a program to convert the max heap into the min heap in linear time.
3. Write a program to check if an array represents min heap or not.
4. Write a program to convert a binary search tree into a min heap.
5. Write a program to implement Binary Tree using structure and pointer.
6. Write a program to implement Binary Search Tree using structure and pointer.
7. Verify if a Binary tree is symmetric around its center i.e: left subtree = right subtree at every node.
8. Create two functions named Encoding and decoding. In Encoding function pass the pointer to the root of binary tree and return the string representation of Binary tree. In Decoding function pass the string and return the root of Binary tree.
9. Write a program to construct Binary tree from Inorder and preorder.
10. Write a program to check if all the leafs of a Binary tree are at the same level or not ?

Section 2:

1. Write code to perform Breadth First Search & Depth First Search on below graph.



2. Consider the graph below. Assume that in the BFS or DFS algorithms, whenever a decision must be made between two or more neighbour nodes, we always pick the letter that is closest to the alphabet's beginning. What order will a Breadth First Search visit the nodes in? What order will a Depth First Search visit the nodes in? Write code for the same.