EL9343 Homework 8

(Due Apr 8th, 2022)

No late submission accepted

All problem/exercise numbers are for the third edition of CLRS text book

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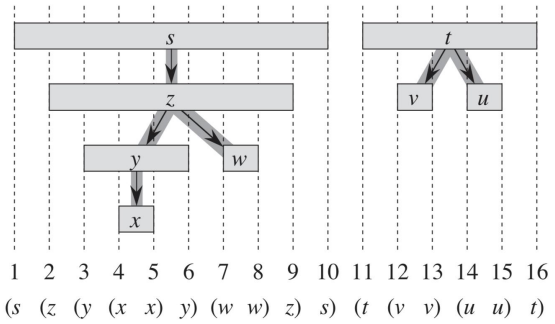
1. What is the running time of DFS if the graph is given as an adjacency list and adjacency matrix? Justify your running time.

2. Write a method that takes any two nodes u and v in a tree T, and quickly determines if the node u in the tree is a *descendant* or *ancestor* of node v

3. Draw the parenthesis structure of the dfs of Figure 1 (start from u, assume that DFS considers vertices in alphabetical order) and see the example parenthesis structure as Figure 2.



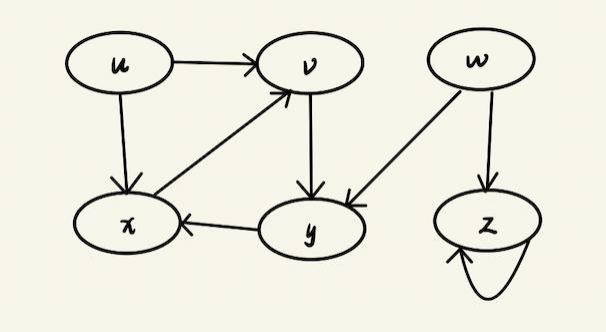


Figure 1

Figure 2

4.Subsets.

Given an ordered integer array *'nums'* of unique elements, write the pseudo code of a function to return *all possible subsets (the power set)*.The solution set must not contain duplicate subsets. You should use the DFS algorithm. You can return the solution in any order.

Example:

nums = [1, 2, 3]

Output :[[], [1], [2], [3], [1, 2], [1, 3], [2, 3], [1, 2, 3]]