# CS 201 – Data Structures II (L2), Spring 2024
# Quiz # 5

Name: _____ ID: _____

Q1- Construct a treap with the sequence of values (value, priority) given below:

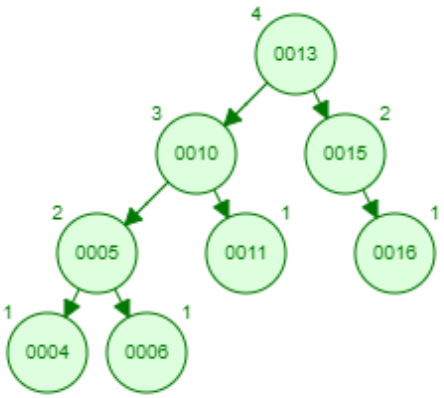
[(value, priority)]: [(12,4), ((36,18), (42,9), (58,15), (49,11)]

Note: The treap is based on **max-heap** property.

| | |
|---|---|
| Insert (12,4) | Type of rotation (if needed): _____<br>After Rotation: |
| Insert (36,18) | Type of rotation (if needed): _____<br>After Rotation: |
| Insert (42,9) | Type of rotation (if needed): _____<br>After Rotation: |
| Insert (58,15) | Type of rotation (if needed): _____<br>After Rotation: |

| | |
|---|---|
| Insert (49,11) | Type of rotation (if needed): _____<br>After Rotation: |

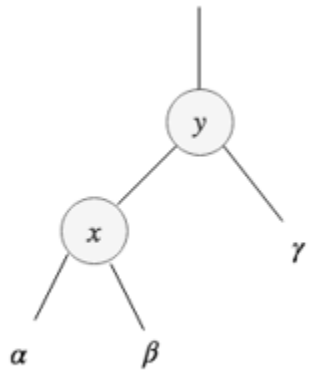
Q2 - Perform the following operations on the AVL tree given below:




| | | |
|---|---|---|
| **a) Insert 7.** | Rotation 1(if needed) | Rotation 2(if needed) |

| | | |
|---|---|---|
| **b) Remove 13 (using the node in the right subtree).** | Rotation 1 (if needed) | Rotation 2(if needed) |

Q3 - Given the following tree, where α, β, and γ are subtrees.




a) How will it look like after performing right rotation on y?

b) Assuming that each node of the tree is also storing its height in the tree, can this height be updated in O(1) time while performing this rotate right operation. How? Justify your answer. The height of a node is the number of edges from the node to the deepest leaf.