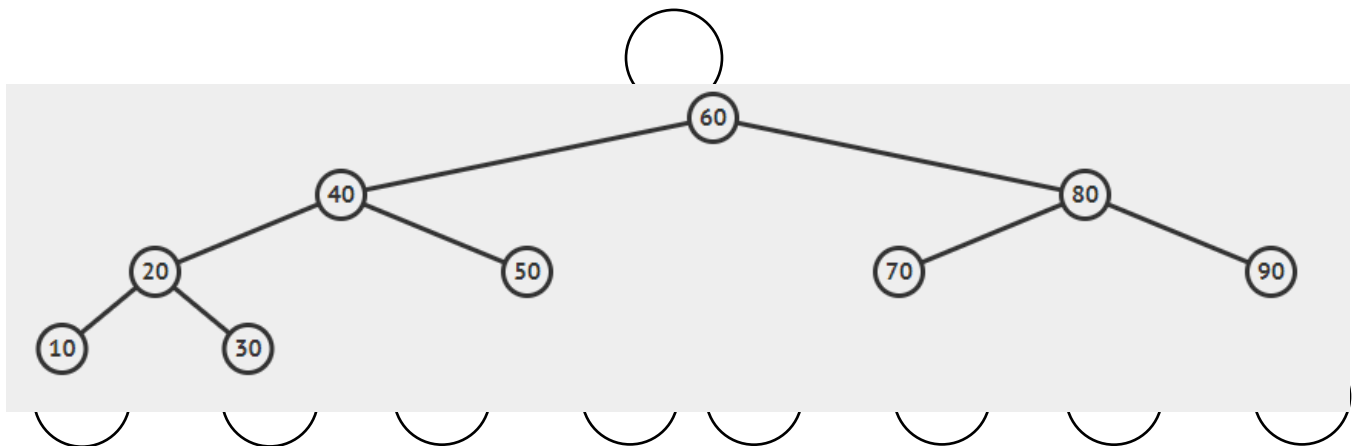# TIC2001 Data Structure and Algorithm Quiz 2
Name: _____   Student #: A_____

Every operation in this quiz has to follow our lecture notes and notations. You don't need to use up all the bubbles, and you can add more bubbles if necessary.

Question 1: AVL BST (12 marks)

Insert the following numbers by the given order into an AVL BST.
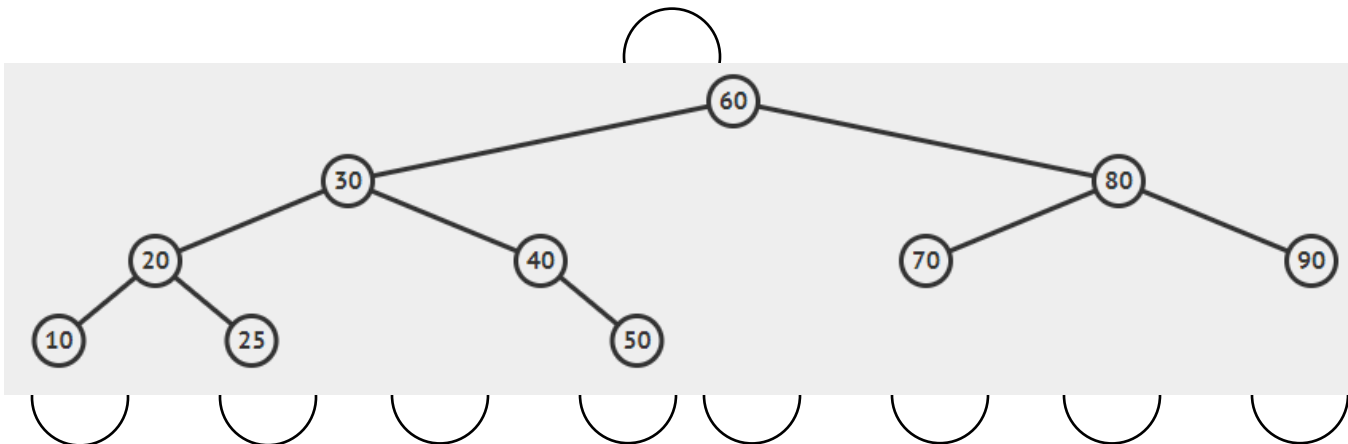
60, 40, 80, 20, 50, 70, 90, 10, 30

Insert 25 into the tree <u>ABOVE</u> **BEFORE (WITHOUT)** any rotation.

Which is the number in the lowest node that lost the height-balance property? ___40_____

How many rotation(s) do you need? _____2_____

Perform the rotation(s) to balance the tree and draw your final balanced tree below:
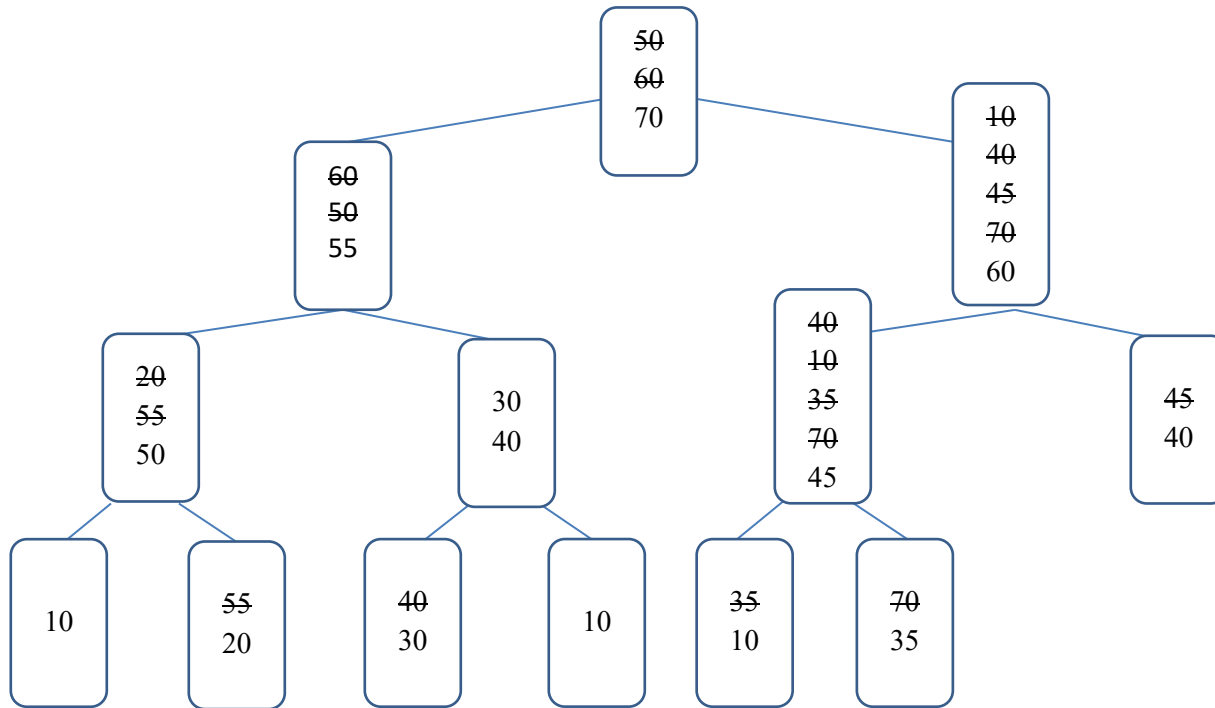
Question 2: Binary Heap (MaxHeap) (12 marks)

Insert the following numbers according to the given order into the binary heap (Maxheap).

50, 60, 10, 20, 30, 40, 45, 10, 55, 40, 10, 35, 70

Perform bubbling if necessary. Note that you need to bubble up and maintain the heap property BEFORE each insertion. The first two are done for you to show you how to do bubbling.

Tree nodes (top to bottom, left to right):

- Root: ~~50~~ ~~60~~ 70
- Left child: ~~60~~ ~~50~~ 55
- Right child: ~~10~~ ~~40~~ ~~45~~ ~~70~~ 60
- Left-left child: ~~20~~ ~~55~~ 50
- Left-right child: 30 40
- Right-left child: ~~40~~ ~~10~~ ~~35~~ ~~70~~ 45
- Right-right child: 45 40
- Leaf: 10
- Leaf: ~~55~~ 20
- Leaf: ~~40~~ 30
- Leaf: 10
- Leaf: ~~35~~ 10
- Leaf: ~~70~~ 35

Question 3: Consultation Booking System. (6 marks)

We all have some notepad kind of app in our computers or phones. We assume our notepad apps only store English characters with any other information such as formatting. And you can write any number of lines with any number of characters in each line. Suggest a data structure in our class to record the text in the computer memory. And give a brief description of how to use it.

Linked list of Linked list

Untitled - Notepad

File   Edit   Format   View   Help

Hello everyone
This is a notepad
I can write something here

Windc   Ln 1, C 100%