King Saud University
College of Computer and Information Sciences
Computer Science Department

CSC 212 **Second Semester 1439-1440**

Tutorial #10

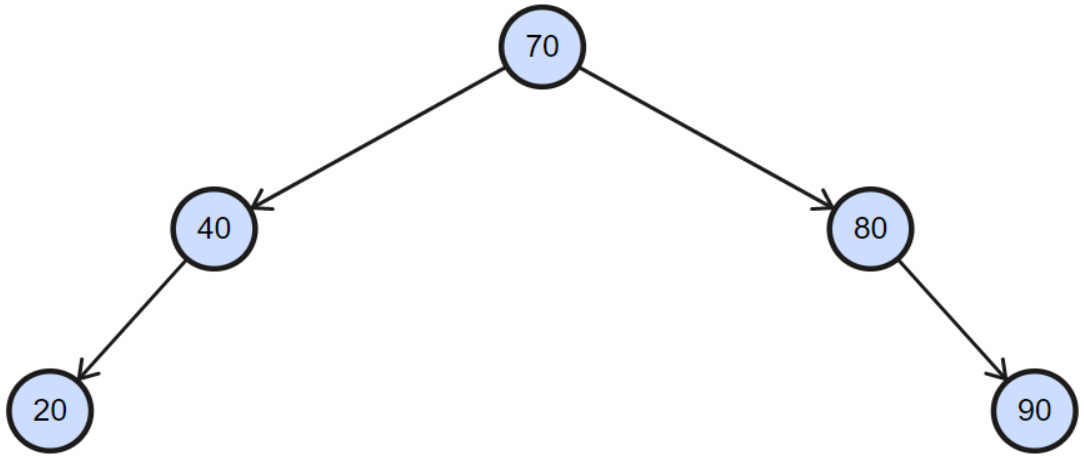
Problem 1:

Insert into an empty AVL tree the following keys:

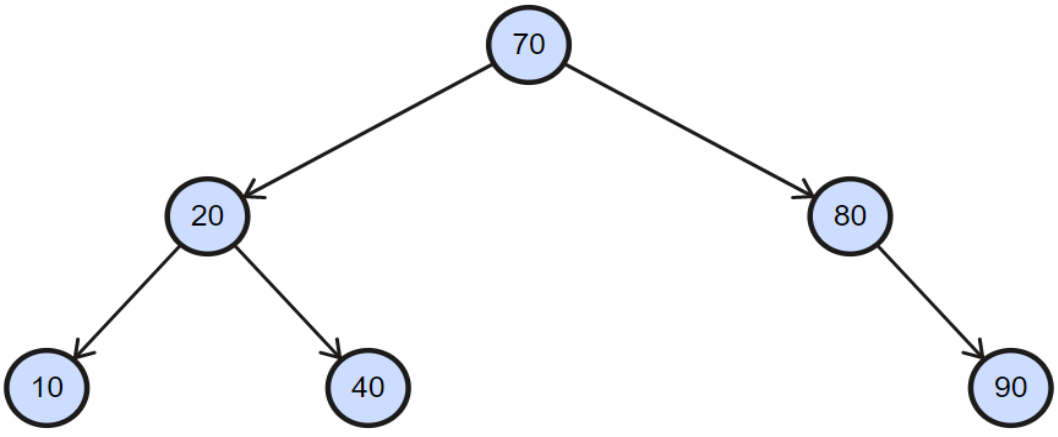
70, 80, 40, 20, 90, 10, 60, 50, 30

Solution:

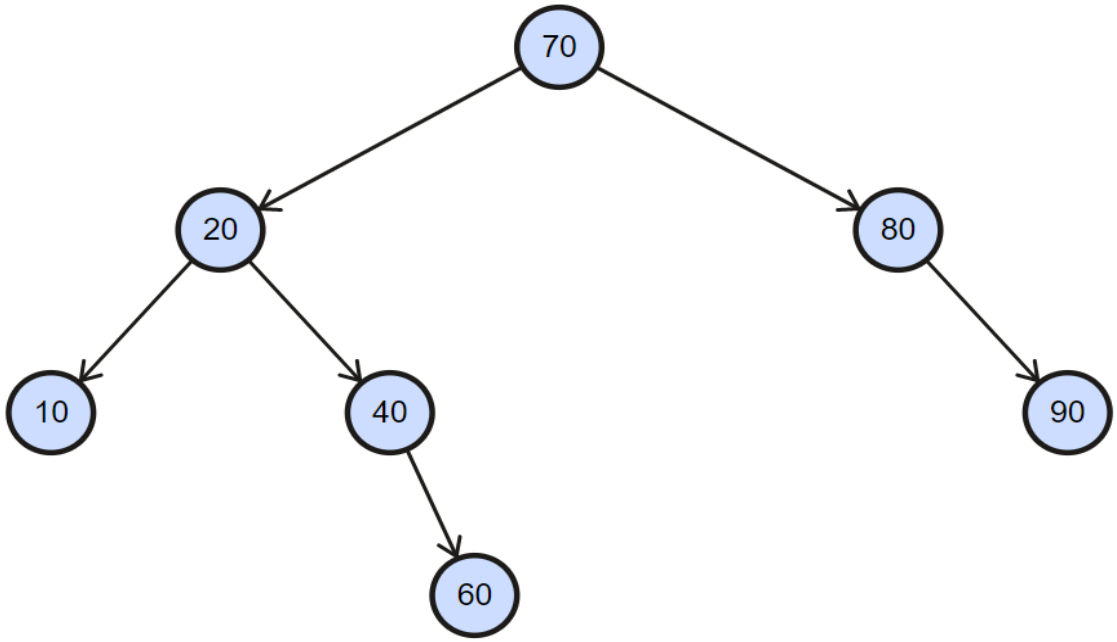
Inserting (70, 80, 40, 20, 90): no adjustments



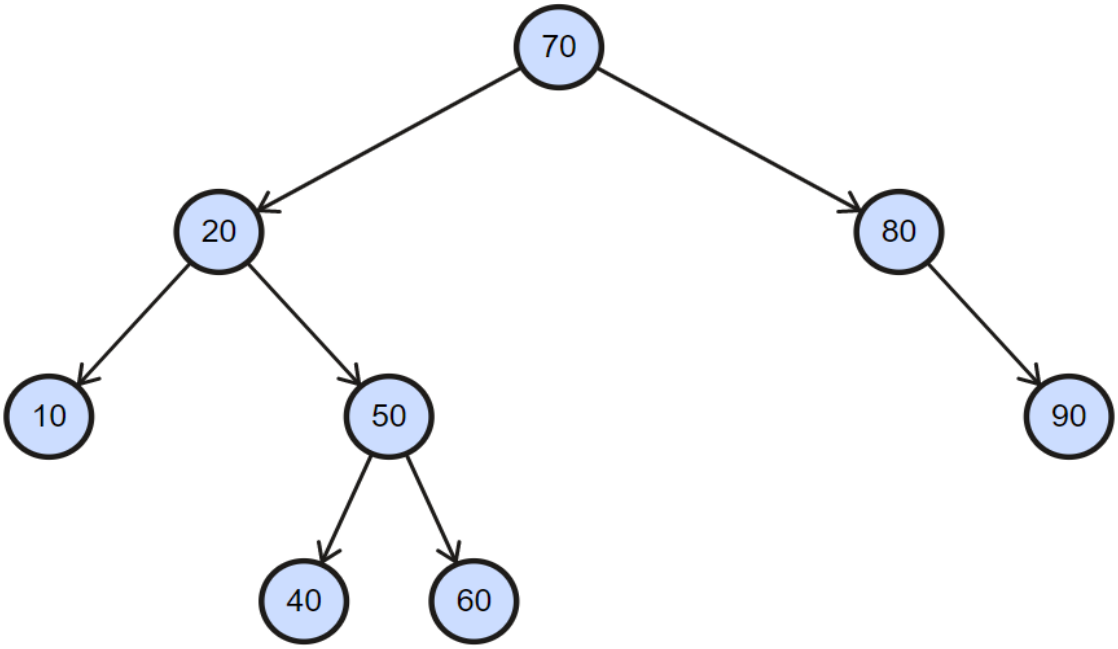
Inserting (10): single rotation to the right



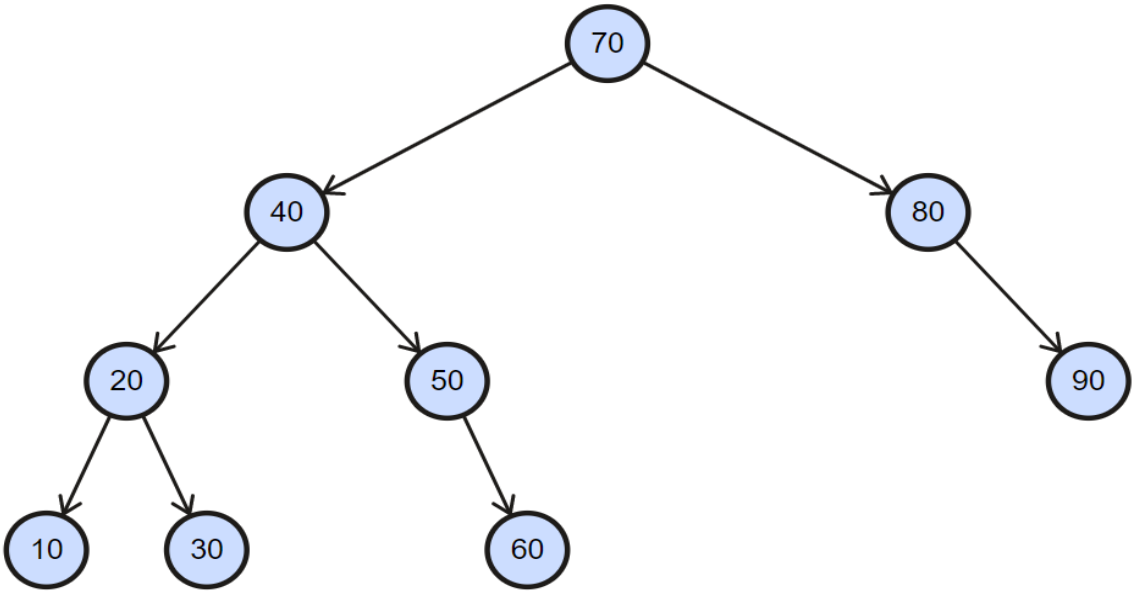
Inserting (60): no adjustments



Inserting (50): double rotation left-right



Inserting (30): double rotation left-right



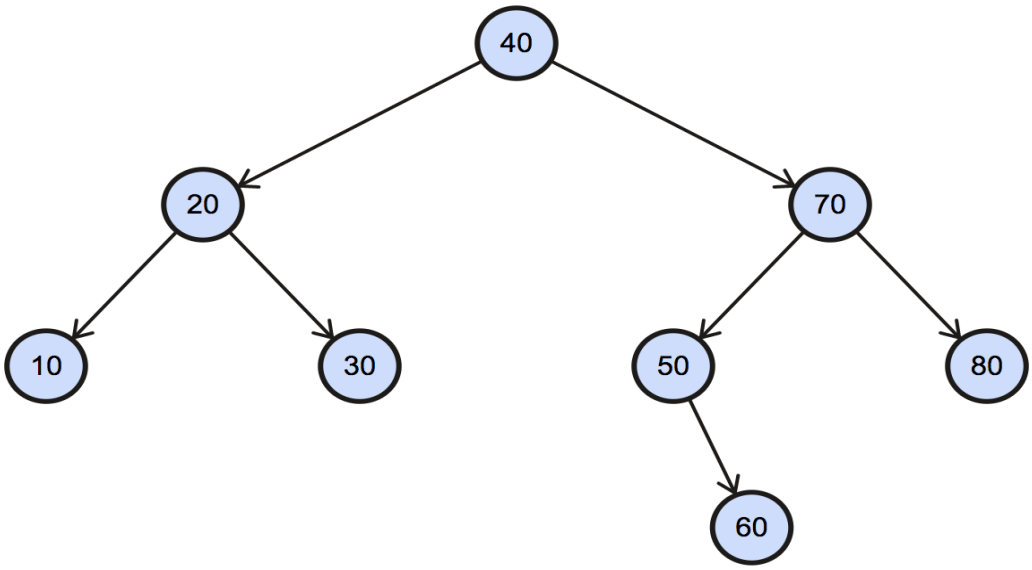
Problem 2:

Remove the following keys from the final AVL tree in problem 1

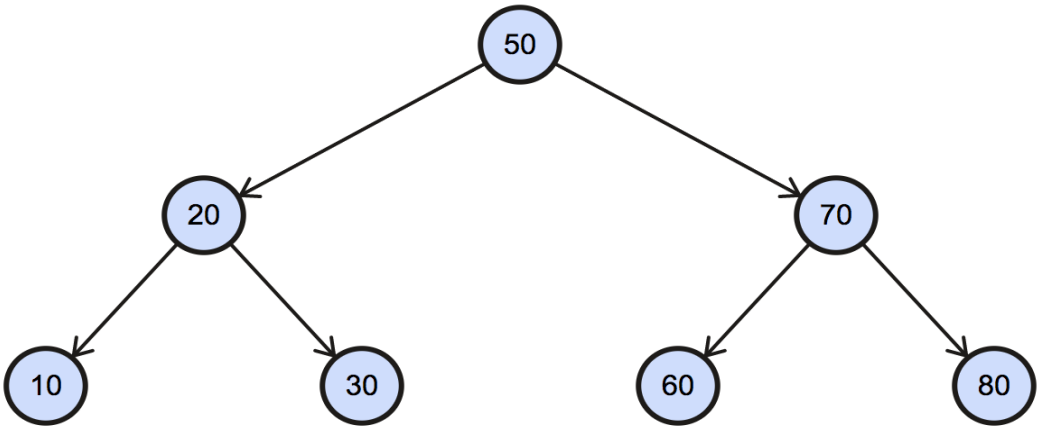
90, 40, 30

Solution:

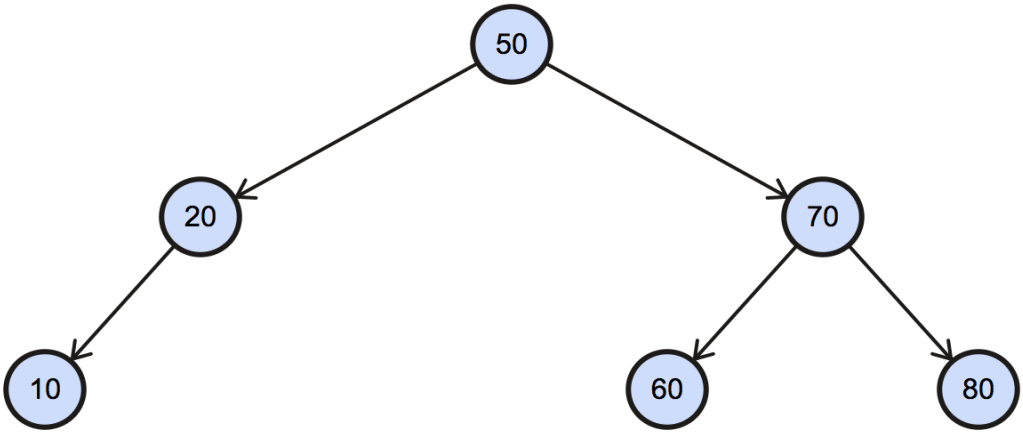
Removing (90): single rotation to the right



Removing (40): no adjustments



Removing (30): no adjustments



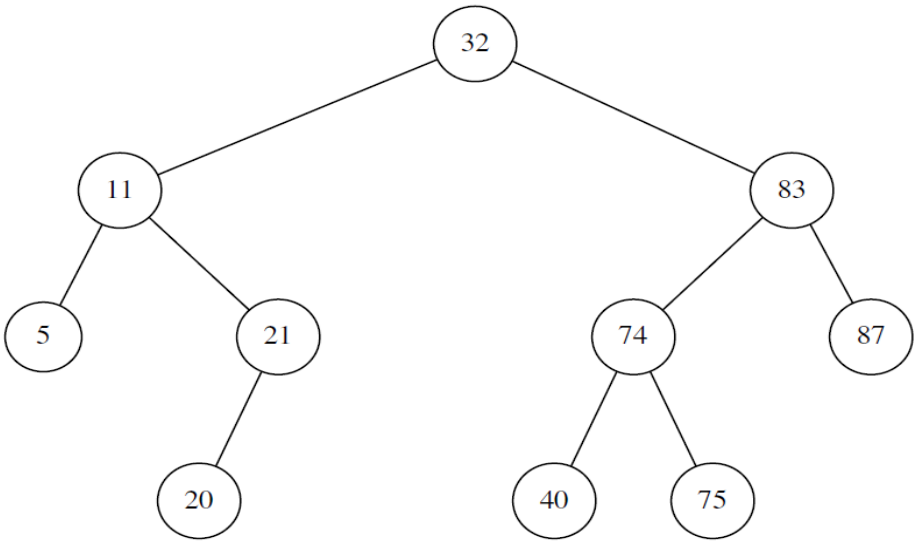
Problem 3:

Perform the following operations on the AVL tree below:

Insert 24, Insert 78, Insert 35, Remove 32, Remove 87.

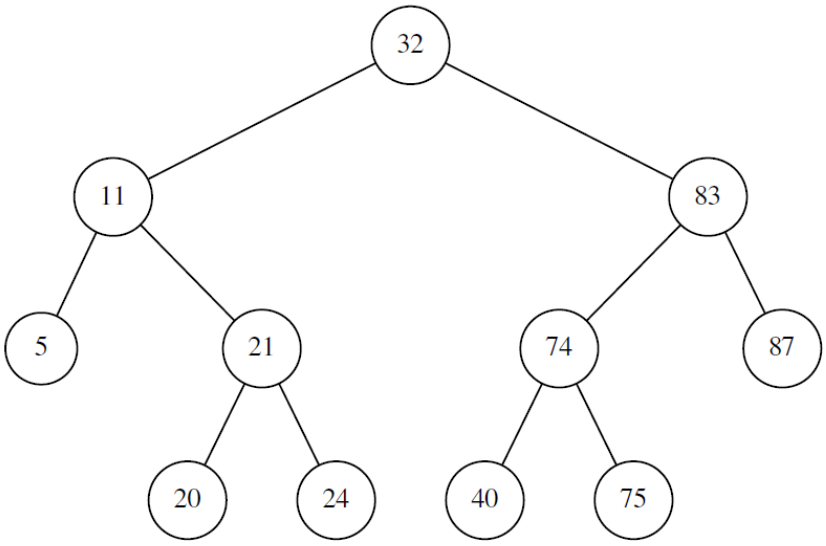
Each operation is independent of the others and must be performed on the original tree.

Make sure to mention the rotation performed (none, single, double).

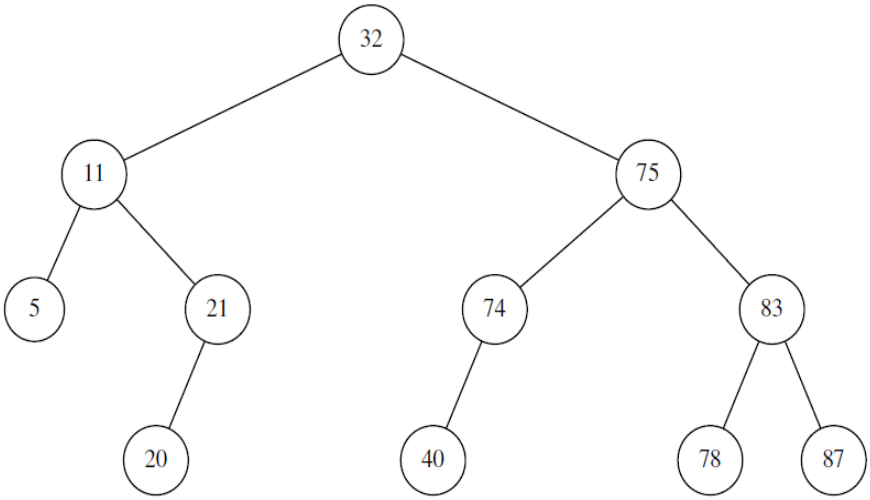


Solution:

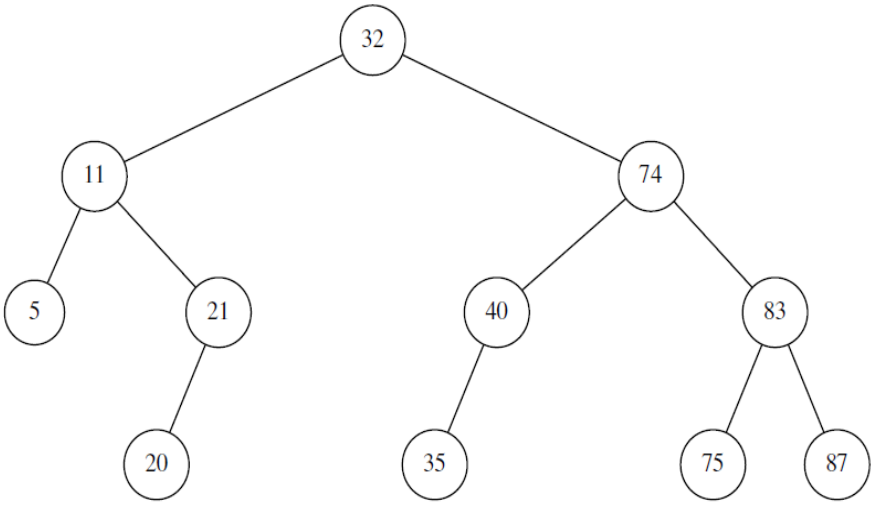
Insering 24, no rotation



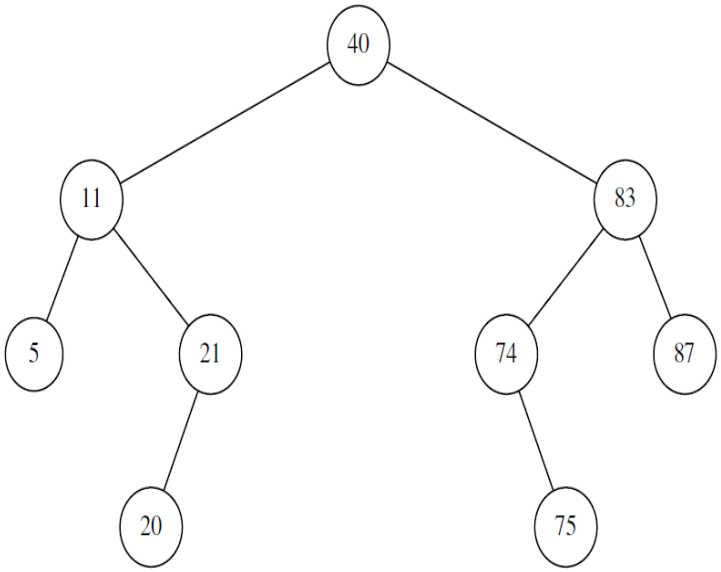
Inserting 78, double rotation



Inserting 35, single rotation



Removing 32, no rotation



Removing 87, single rotation