* Assignment No-11*.

*Title: program for find out maximum and
minimum marks obtained in that subject use
the heap.

* Objectives:-
1) To understand the concept of heap.
2) To understand features like heap, min, max

* problem statement:-
Read the marks obtained by
student of second year in an online examination.
of particular subject find out maximum marks
obtained in that subject. Use heap data structure
Analyze the algorithm.

* learning outcome:-
1) Define class of heap oop
2) Analyze working of function.

* S/w Requirement:
gedit s/w and terminal, 64 bit
fedora, eclipse.

○ Input: marks obtained by student.
○ output: find min & max marks obtained.

* Theory -:
Heap is special case of balance
binary tree is compaired with its children.
and arranged accordingly. If has node then

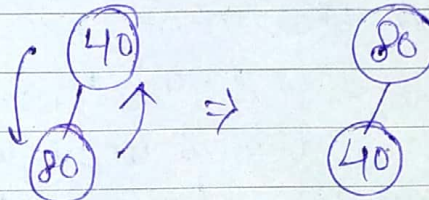$Key (v) \geqslant key (\beta)$.

for Example :-

   Data : 40, 80, 35, 90, 45, 50, 70.
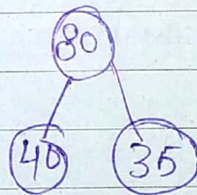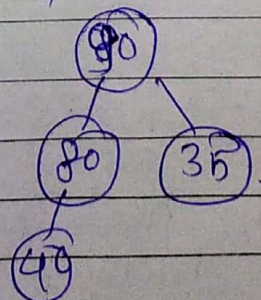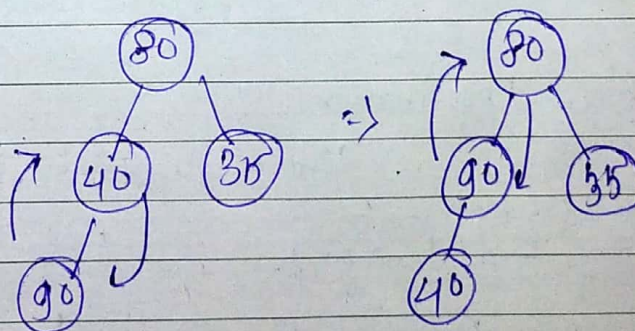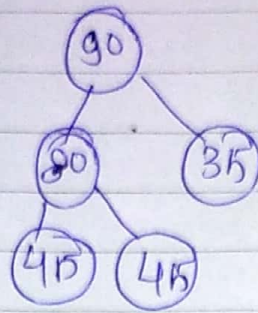
create max heap.

Insert 40 :

(40)

insert 80 :-

(40)
  |
(80) $\Rightarrow$ (80)
                      |
                    (40)

insert 35 :-

     (80)
    /   \
  (40)   (35)

insert 90 :-

        (80)   (80)
       /   \   /   \
     (40)   (35) $\Rightarrow$ (90)   (35)
     /   /
   (90)   (40)

$\Downarrow$
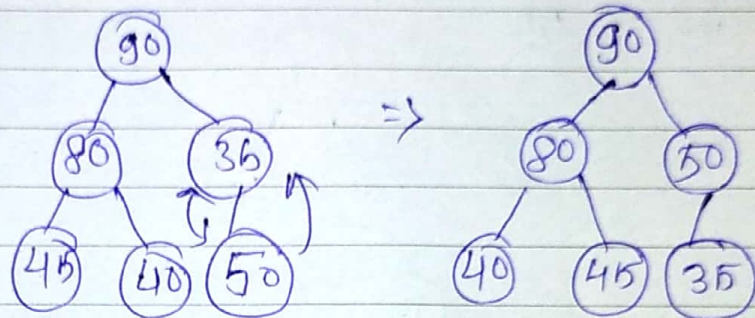
        (90)
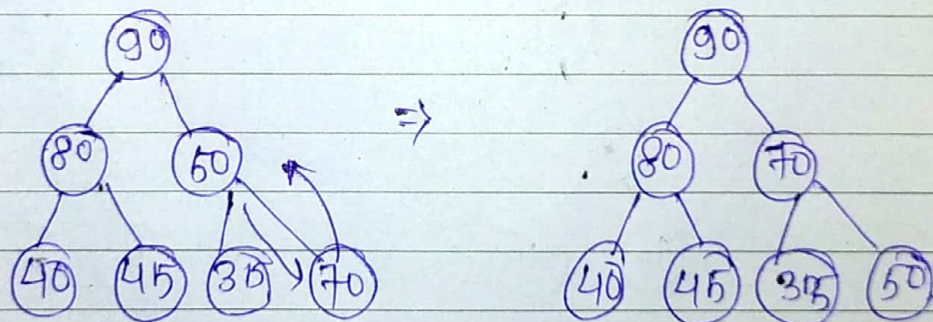   /   \
     (80)   (35)
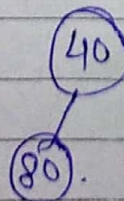   /
   (40)

insert 45 :
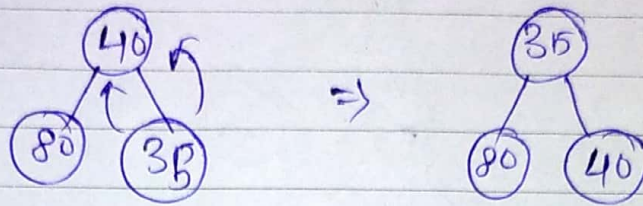

insert 50 :

insert -70 :

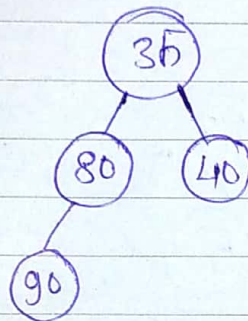Create : min heap.
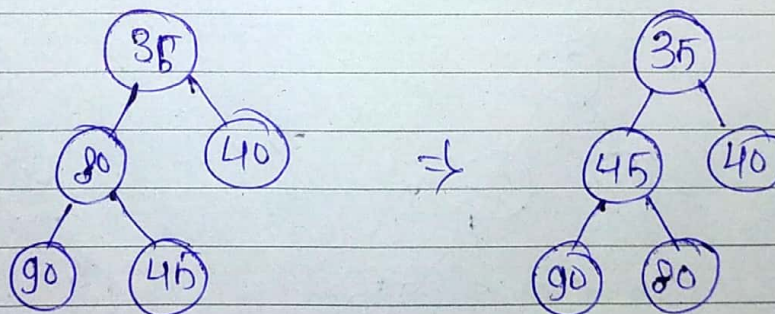
insert 40 ..

Insert 80 :

insert - 35

insert 35 →
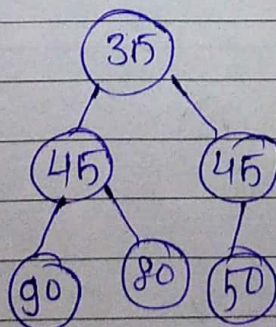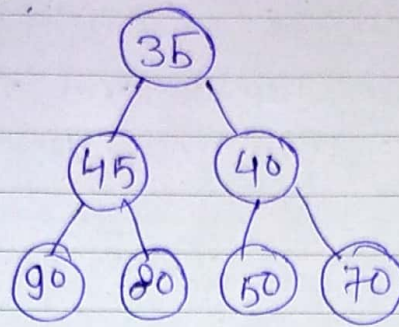(90)

insert 45 →

insert 50 →

insert 70:

○ Min heap Construction Algorithm:
1) Create a new node at the end of heap
2) Assign new value at end of heap.
3) Compare the value of its childs node its parent.
4) If the value of parent is less than child node with its parent.
5) Repeat step 3 & 4 until heap property
6) It mean heap construction except value of parent node.

○ Max heap deletion Algorithm :-
1) Remove the root.
2) Move the least element of last level of root.
3) Its parent compare the value of its chilld node.
4) If value of parent is less than max heap deletion Repeat step 3 & 4 until heap property.

* Conclusion :-

      Hence we should and implemented the max heap & min heap using heap data structure.