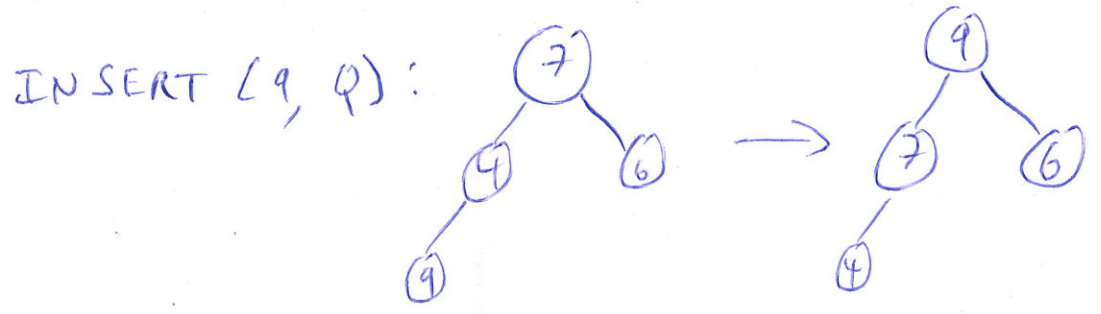
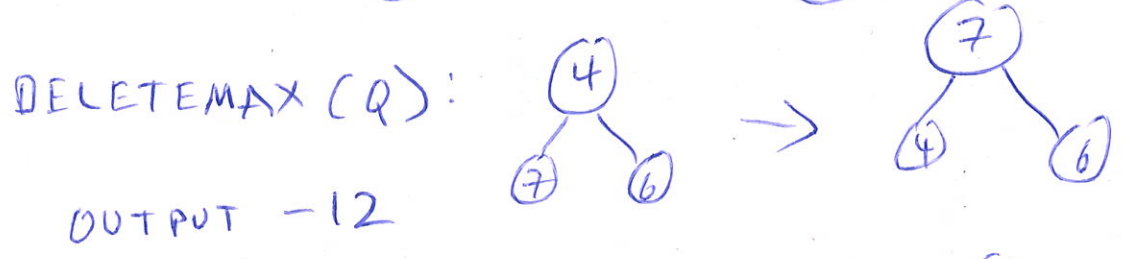
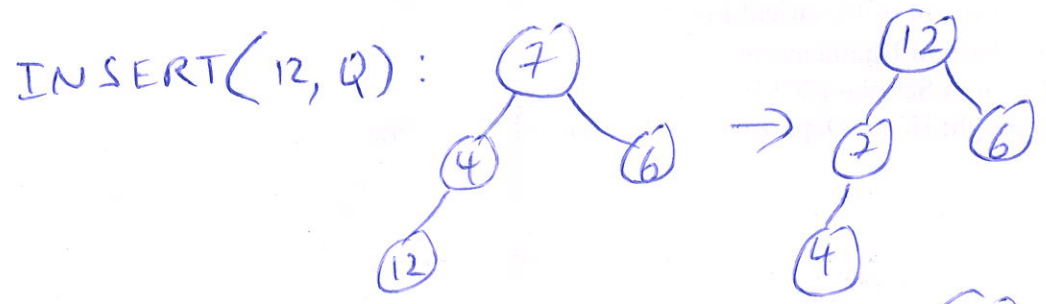
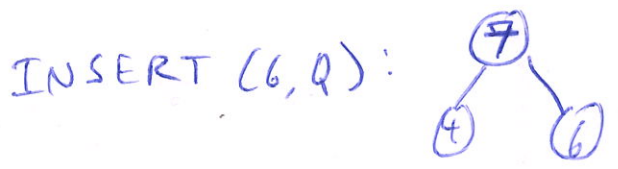
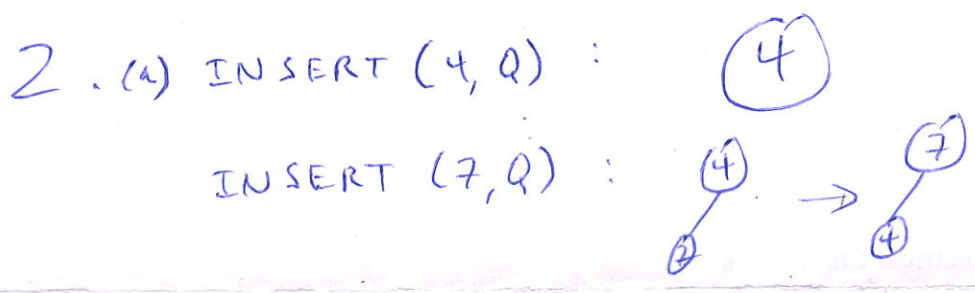
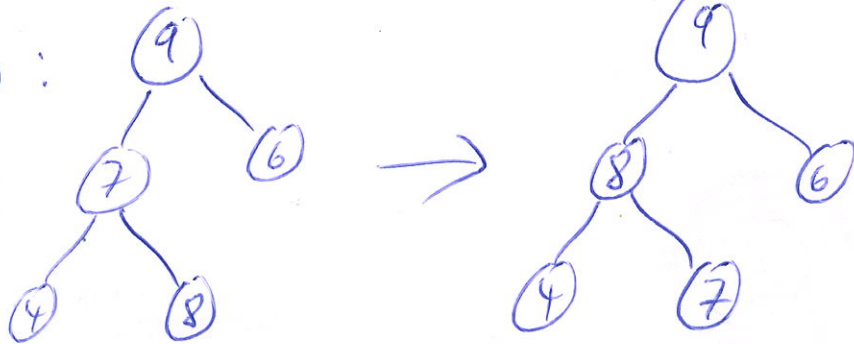


$$\begin{aligned}
 1. \quad T(n) &= 2T(n-1) + 1 \\
 &= 2(2T(n-2) + 1) + 1 \\
 &= 4T(n-2) + 3 \\
 &= 8T(n-3) + 7 \\
 &\vdots \\
 &= 2^{n-1}T(1) + 2^{n-1} - 1 \\
 &= \underline{2^n - 1}
 \end{aligned}$$

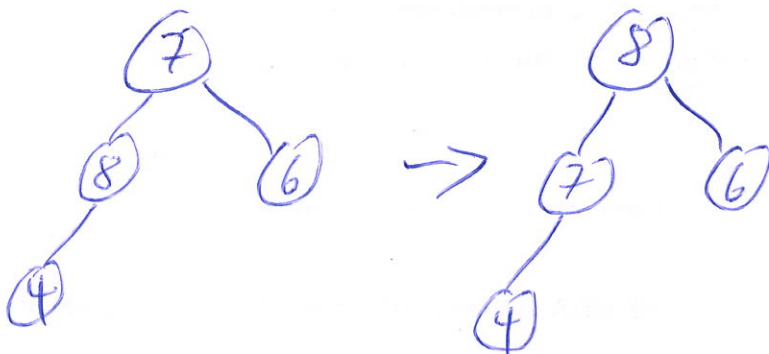


INSERT (8, Q) :



DELETEMAX (Q) :

OUTPUT - 9



(6) 

8	7	6	4			...
---	---	---	---	--	--	-----

3. Node data structure:

```
struct node {
    int element;
    struct node* leftchild;
    struct node* rightchild;
}
```

Function:

```
bool MEMBER (int x, struct node* A)
```

```
{
```

```
    if (A == NULL)
```

```
        return false;
```

```
    else if (x == A->element)
```

```
        return true;
```

```
    else while (A != NULL) {
```

→ not needed

if ( $x < A \rightarrow \text{element}$ )

$A = A \rightarrow \text{leftchild};$

else if ( $x > A \rightarrow \text{element}$ )

$A = A \rightarrow \text{rightchild};$

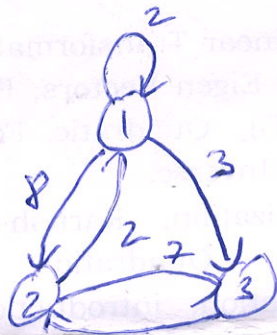
else

return true;

}

return false;

4. (a)



(b)  $A_0 = \begin{bmatrix} 0 & 8 & 3 \\ 2 & 0 & 7 \\ \infty & 2 & 0 \end{bmatrix}$   $P = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

$A_1 = \begin{bmatrix} 0 & 8 & 3 \\ 2 & 0 & \textcircled{5} \\ \infty & 2 & 0 \end{bmatrix}$   $P = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & \textcircled{1} \\ 0 & 0 & 0 \end{bmatrix}$

$A_2 = \begin{bmatrix} 0 & 8 & 3 \\ 2 & 0 & 5 \\ \textcircled{4} & 2 & 0 \end{bmatrix}$   $P = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & \textcircled{1} \\ \textcircled{2} & 0 & 0 \end{bmatrix}$

$$A_3 = \begin{bmatrix} 0 & 5 & 3 \\ 2 & 0 & 5 \\ 4 & 2 & 0 \end{bmatrix}$$

$$P = \begin{bmatrix} 0 & 3 & 0 \\ 0 & 0 & 1 \\ 2 & 0 & 0 \end{bmatrix}$$

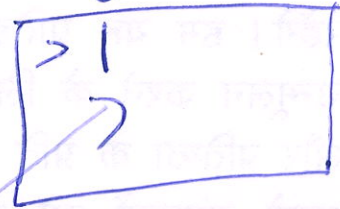
(c) path (2,3)

path (2,1)

print '1'

path (1,3)

OUTPUT:



PLZ

WE THE PUBLIC SERVANTS OF INDIA, IN HONOURABLE POTENTIALITY, PLEDGE THAT WE SHALL CONTINUOUSLY STRIVE TO BRING ABOUT INTEGRITY AND TRANSPARENCY IN ALL SPHERES OF OUR ACTIVITIES. WE ALSO PLEDGE THAT WE SHALL WORK UNSTINTINGLY FOR ERADICATION OF CORRUPTION IN ALL SPHERES OF LIFE. WE SHALL RESOLVE TO GO ON WITH TOWARDS THE GROWTH AND REPUTATION OF OUR ORGANISATION. THROUGH OUR COLLECTIVE EFFORTS, WE SHALL BRING PRIDE TO OUR ORGANISATION AND PROVIDE VALUE BASED SERVICE TO OUR COUNTRYMEN. WE SHALL DO OUR DUTY CONSCIENTIOUSLY AND ACT WITHOUT FEAR OR FAVOUR.