

Experiment - 04

- Q. Write a 'c' program to sort data from given array using.
 i) insertion sort

```
#include <stdio.h>
int main()
{
    int a[100], n, i, j, k, n = 1;
    printf("Enter no. of element: ");
    scanf("%d", &n);
    printf("Enter elements of array: ");
    for (i = 0; i < n; i++)
        scanf("%d", &a[i]);
    for (i = 1, j = i; i < n; i++)
    {
        for (j = 0; j < i; j++)
            if (a[j] > a[j + 1])
            {
                k = a[j];
                for (k = i - 1; k >= j; k--)
                    a[k + 1] = a[k];
                a[j] = k;
            }
        printf("Array after pass %d: ", i);
    }
}
```

```

    for (i=0; i < n; i++)
    {
        printf("%d ", a[i]);
    }
    printf("\n\nSorted - array in ascending,
           & demand: ");
    for (i=0; i < n; i++)
    {
        printf("%d-%d", a[i]);
    }
    return 0;
}

```

Output:-

Enter no. of elements in array: 5

Enter Elements:-

9000

569

8589

6

3456

Array - after pass 1: -569, 9000, 8589 & 3486

Array, after pass 2: - 569 8589 9000 6 3486

Array after pass 3: - 6 569 8589 9000 3486

Array after pass 4: - 6 569 3456 8589 9000

Q3) What is the output of insertion sort after the 2nd iteration given following 7, 3, 5, 1, 9, 8, 4, 6

7 3 5 1 9 8 4 6

1st iteration

7319486

3 7 1 9 4 8 6

2nd infarction

3 7 1 9 4 8 6

1 3 7 9 4 8 6

After 2nd infestation the result-

1, 3, 7, 9, 4, 8, 6

Q3) Sort the following.

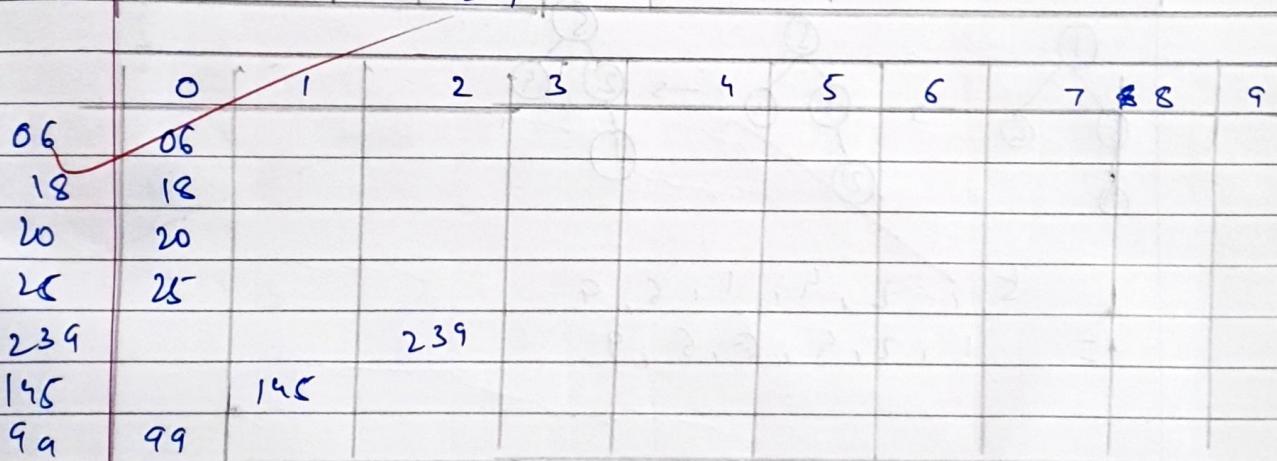
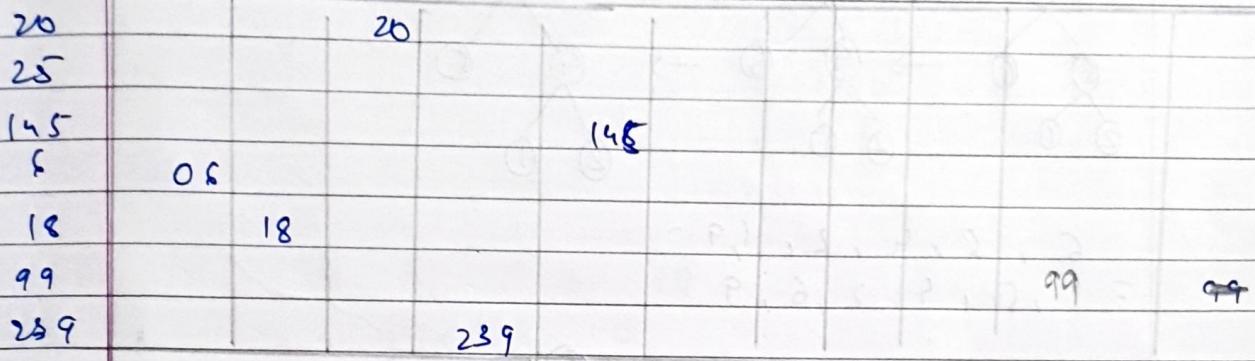
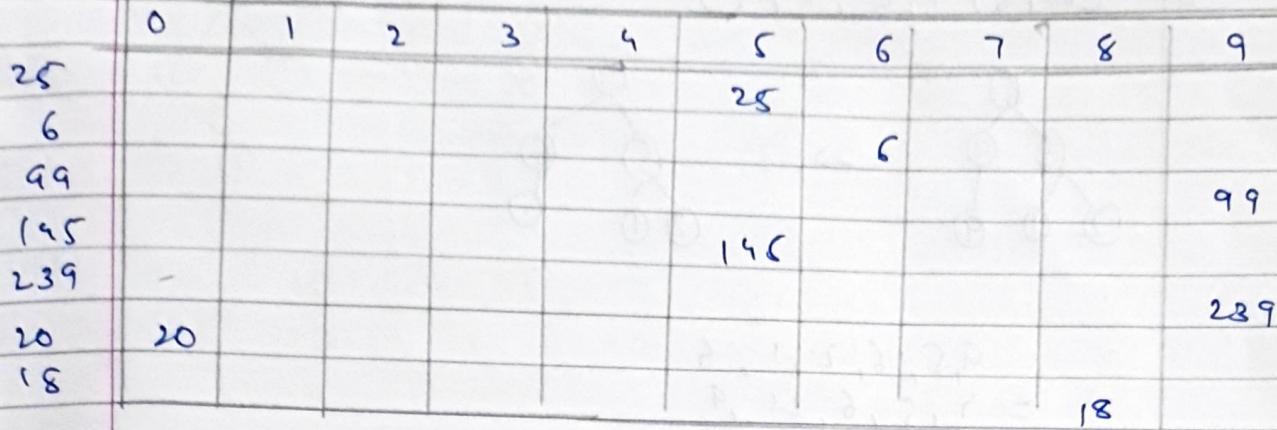
	0	1	2	3	4	5	6	7	8	9
100	100									
225		225								
390										390
4130			4130	4130						
966							966			
99										99
5431				5431						

	0	1	2	3	4	5	6	7	8	9
100		100								
225			225							
390				390						
4130		4130								
966									966	
99										99
5431					5431					

	0	1	2	3	4	5	6	7	8	9
100	100									
225	225									
390	390									
4130					4130					
966	966									
99	99									
5431						5431				

→ 99, 100, 225, 390, 956, 4130, 5431

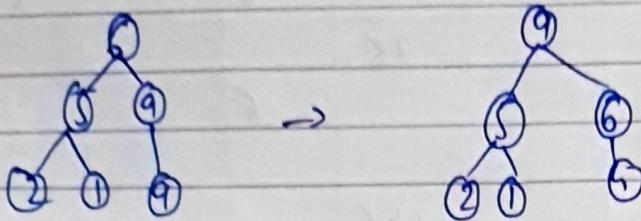
25 25 , 6 , 99 , 145 , 239 , 20 , 18



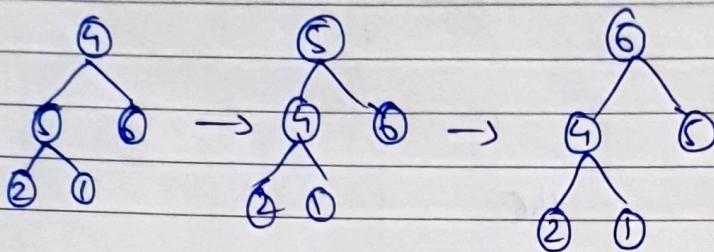
→ 6 , 18 , 20 , 25 , 239 , 145 , 99

Q4) Sort following element using heap sort.

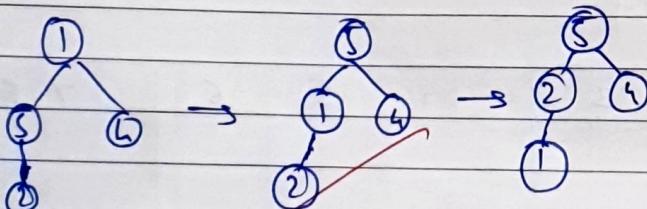
v [6, 5, 9, 2, 1, 4]



$$\begin{matrix} 9, 5, 6, 2, 1, 4 \\ = 4, 5, 6, 2, 1, 9 \end{matrix}$$

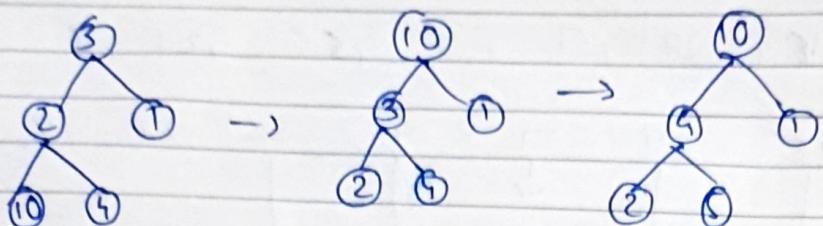


$$\begin{matrix} 6, 5, 4, 2, 1, 9 \\ = 1, 5, 4, 2, 6, 9 \end{matrix}$$

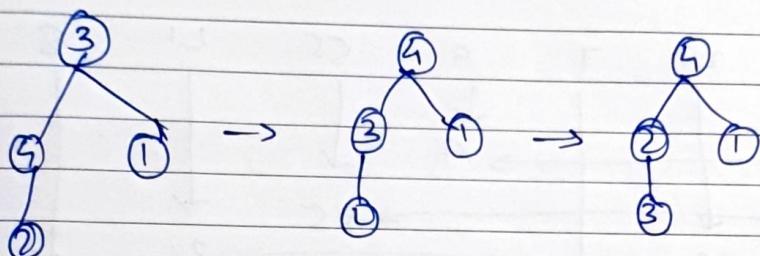


$$\begin{matrix} 5, 1, 2, 4, 1, 6, 9 \\ = 1, 2, 4, 5, 6, 9 \end{matrix}$$

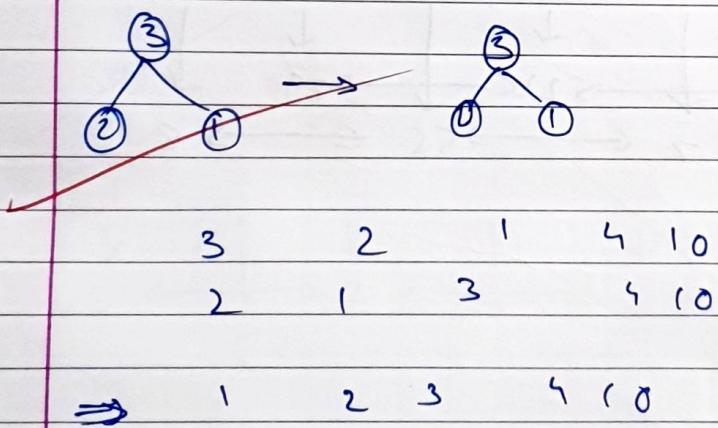
2) [3, 2, 1, 10, 4]



$\leftarrow \begin{matrix} 10 & 14 & 1 & 2 & 3 \\ 3 & 4 & 1 & 2 & 10 \end{matrix}$

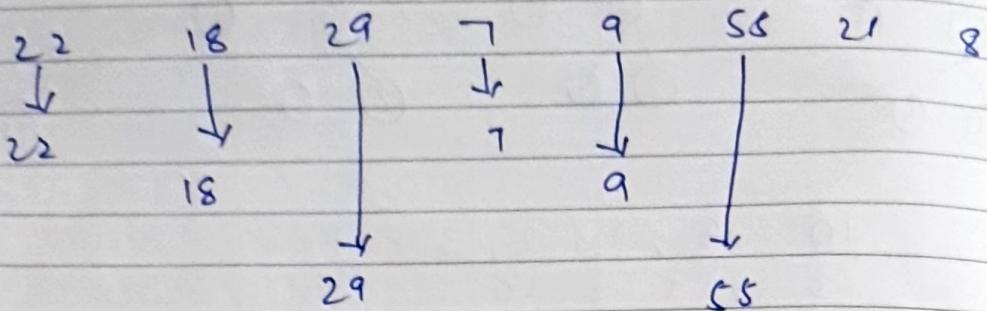


$\leftarrow \begin{matrix} 4 & 2 & 1 & 3 & 10 \\ 3 & 2 & 1 & 4 & 10 \end{matrix}$

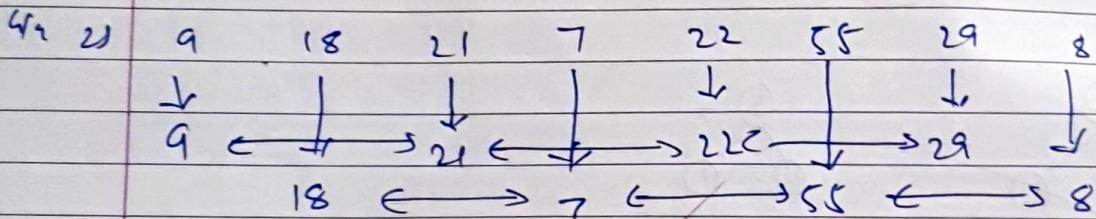
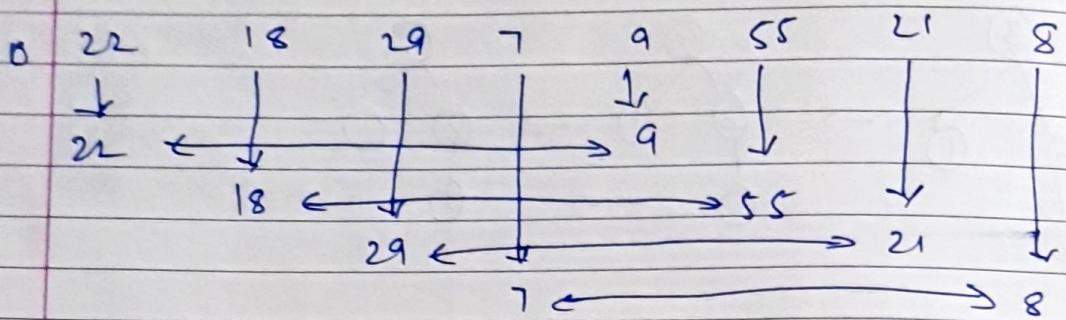


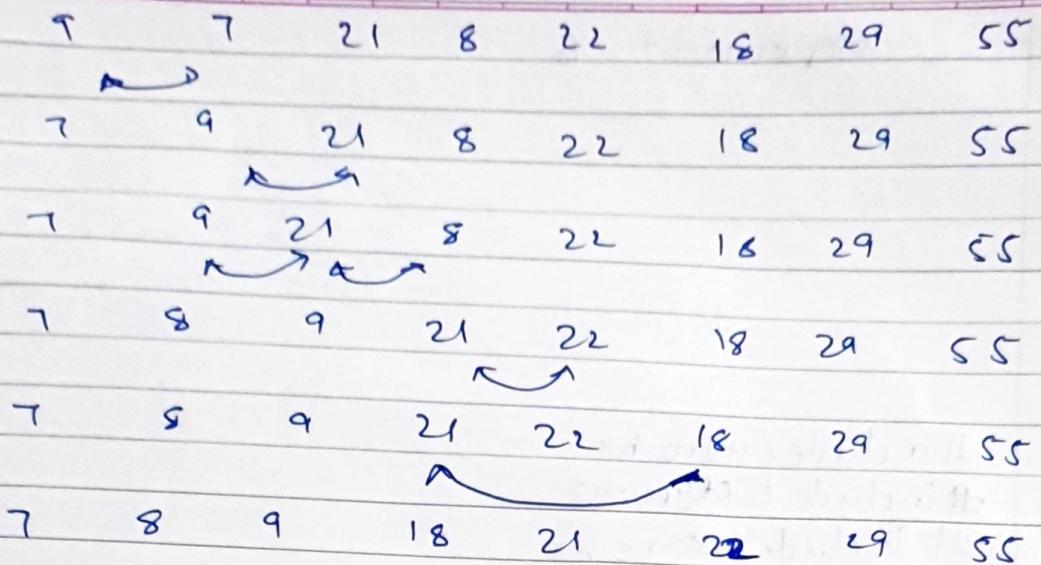
Q.5) Sort following using shelf sort

Q) 22, 18, 29, 7, 9, 55, 21, 8



X/2





y [3, 10, 15, 12, 1, 5, 2, 8]

