DAY 13 – HEAP SORT

16.Write a C program to implement heap sort

PROGRAM

```c
#include <stdio.h>
#define SIZE 20
int heap[SIZE], finalheap[SIZE], n, item;
void insert(int i)
{
    int val = heap[i];
    while(i > 1 && heap[i / 2] < val)
    {
    heap[i] = heap[i / 2];
    i /= 2;
    }
    heap[i] = val;
}
void delete()
{
    int last, ptr = 1, left = 2, right = 3, temp;
    item = heap[1];
    last = heap[n];
    n = n - 1;
    heap[ptr] = last;

    while(left <= n)
    {
        if(heap[ptr] >= heap[left] && heap[ptr] >= heap[right])
        return;
        if(heap[right] <= heap[left])
        {
            temp = heap[ptr];
            heap[ptr] = heap[left];
            heap[left] = temp;
            ptr = left;
        }
        else
        {
            temp = heap[ptr];
            heap[ptr] = heap[right];
            heap[right] = temp;
            ptr = right;
        }
        left = 2 * ptr;
        right = left + 1;
    }
}
void main()
{
```

```
    int i, temp, k;
    printf("Enter the no. of elements: ");
    scanf("%d", &n);
    printf("Enter the elements: ");
    for(i = 1; i <= n; i++)
    {
        scanf("%d", &heap[i]);
        insert(i);
    }
    printf("Heap array: ");
    for(i = 1; i <= n; i++)
    printf("%d ", heap[i]);
    temp = n;
    k = n;
    while(n >= 1)
    {
        delete();
        finalheap[k--] = item;
    }
    n = temp;
    printf("\nSorted array: ");
    for(i = 1; i <= n; i++)
        printf("%d ", finalheap[i]);
}
```

OUTPUT