S.No: 10	Exp. Name: ***Write a C program to sort the given elements using Heap sort***	Date:2023-05-17

Aim:

Write a program to sort (ascending order) the given elements using heap sort technique.

Note: Do use the printf() function with a newline character (\n).

Source Code:

HeapSortMain.c

```
#include<stdio.h>
void main()
{
   int arr[15], i, n;
   printf("Enter array size : ");
   scanf("%d",&n);
   printf("Enter %d elements : ",n);
   for(i=0;i<n;i++)
   {
      scanf("%d",&arr[i]);
   }
printf("Before sorting the elements are : ");
display(arr, n);
heapsort(arr, n);
printf("After sorting the elements are : ");
display(arr, n);
}
int display(int arr[15],int n)
{
   int i;
   for(i = 0 ;i < n ;i++)
   {
      printf("%d ",arr[i]);
   }
   printf("\n");
   }
   int heapsort(int arr[15], int n)
   {
      int i;
      for(i = n/2-1 ;i>=0 ;i--)
      {
         heapify(arr,n,i);
      }
   for(int i = n-1;i >= 0 ;i--)
      {
         int temp=arr[0];
         arr[0]=arr[i];
         arr[i]=temp;
         heapify(arr,i,0);
      }
   }
   int heapify(int arr[15],int n,int i)
   {
      int largest=i;
```

```
    int l=2*i+1;
    int r=2*i+2;
    if(l<n && arr[l]>arr[largest])
    largest = l;
    if(r<n && arr[r]>arr[largest])
    largest=r;
    if(largest!=i)
    {
       int temp=arr[i];
       arr[i]=arr[largest];
       arr[largest]=temp;
       heapify(arr,n,largest);
    }
  }
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter array size : 5
Enter 5 elements : 23 54 22 44 12
Before sorting the elements are : 23 54 22 44 12
After sorting the elements are : 12 22 23 44 54

Test Case - 2
User Output
Enter array size : 6
Enter 6 elements : 12 65 23 98 35 98
Before sorting the elements are : 12 65 23 98 35 98
After sorting the elements are : 12 23 35 65 98 98

Test Case - 3
User Output
Enter array size : 4
Enter 4 elements : -23 -45 -12 -36
Before sorting the elements are : -23 -45 -12 -36
After sorting the elements are : -45 -36 -23 -12

Test Case - 4
User Output
Enter array size : 6
Enter 6 elements : 1 -3 8 -4 -2 5
Before sorting the elements are : 1 -3 8 -4 -2 5
After sorting the elements are : -4 -3 -2 1 5 8

ID: 224G1A05B6
Srinivasa Ramanujan Institute of Technology
2022-2026-CSE-B