**ASSIGNMENT: 6**

**AIM:**

Read the marks obtained by students of second year in an online examination of particular subject. Find out maximum and minimum marks obtained in that subject using heap data structure.

**CODE:**

#include <iostream>

using namespace std;

// Toheapify a subtree rooted with node i which is

// an index in arr[]. n is size of heap

voidheapify(intarr[], int n, inti)

{

int largest = i; // Initialize largest as root

int l = 2\*i + 1; // left = 2\*i + 1

int r = 2\*i + 2; // right = 2\*i + 2

// If left child is larger than root

if (l < n &&arr[l] >arr[largest])

largest = l;

// If right child is larger than largest so far

if (r < n &&arr[r] >arr[largest])

largest = r;

// If largest is not root

if (largest != i)

{

swap(arr[i], arr[largest]);

// Recursively heapify the affected sub-tree

heapify(arr, n, largest);

}

}

// main function to do heap sort

voidheapSort(intarr[], int n)

{

for (inti = n / 2 - 1; i>= 0; i--)

heapify(arr, n, i);

for (inti=n-1; i>=0; i--)

{

swap(arr[0], arr[i]);

heapify(arr, i, 0);

}

}

int main()

{

intn,arr[100];

cout<<"Enter the no. of student's marks you want to enter. :\n";

cin>>n;

cout<<"Enter the marks :\n";

for(inti=0;i<n;i++)

{

cin>>arr[i];

}

heapSort(arr, n);

cout<< "The maximum marks are: "<<arr[n-1]<<"\n";

cout<<"The minimum marks are: "<<arr[0]<<"\n";

}

