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Roll: 53

Subject: DSA

### LAB ASSIGNMENT NO. 09

```
#include<iostream>

using namespace std;

void heapify(int arr[], int n, int j)
{
    int temp;
    int largest = j;
    int left = 2 * j + 1; //left=9
    int right = 2 * j + 2; //right=10
    if (left < n && arr[left] > arr[largest]) //left<10 true and arr[9]=25 >arr[4] =10
        largest = left; //largest =9
    if (right < n && arr[right] > arr[largest]) //right!=10
        largest = right;
    if (largest != j) {
        temp = arr[j];
        arr[j] = arr[largest];
        arr[largest] = temp; //20 7 1 54 25 15 90 23 77 10
        heapify(arr, n, largest); //arr, 10,largest=9
    }
}

void heapSort(int arr[], int n) {
    int temp;
    for (int i = n / 2 - 1; i >= 0; i--)
        heapify(arr, n, i); //n=10,i=4
    for (int k = n - 1; k >= 0; k--) //i=9 to 0
    {
        temp = arr[0]; //This is used to delete element
```

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arr[0] = arr[k];
arr[k] = temp; //10 7 1 54 25 15 90 23 77 20
heapify(arr, k, 0); //k=9 will be copied into n therefore now 9 elements will be considered
}
}
int main() {
    int arr[] = { 20, 7, 1, 54, 10, 15, 90, 23, 77, 25};
    int n = 10;
    int i;
    cout<<"Given array is: "<<endl;
    for (i = 0; i<n; i++)
        cout<<arr[i]<<" ";
    cout<<endl;
    heapSort(arr, n);
    cout<<"\nSorted array is: \n";
    for (i = 0; i < n; i++)
        cout<<arr[i]<<" ";
}

```

## Output

Given array is:

20 7 1 54 10 15 90 23 77 25

Sorted array is:

1 7 10 15 20 23 25 54 77 90