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School of Computer Application

CA-3

On

CAP770:ADVANCED DATA STRUCTURES

Session 2022-2024

Submitted to:

Name: Mr. Ashim Sharma
(Dept of. Computer Science)

Submitted by:

Name: Sanjeev Kumar
Roll no: RDOC14 A26
Course: MCA

Department of Computer Science
Lovely Professional University Jalandhar Punjab (144401)
India

Que-1 Write a program that takes 10 numbers as input and sort them using heapsort?

```
#include <iostream>
using namespace std;

void heapify(int arr[], 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) {
        swap(arr[i], arr[largest]);
        heapify(arr, n, largest);
    }
}

void heapSort(int arr[], int n) {
    for (int i = n / 2 - 1; i >= 0; i--)
        heapify(arr, n, i);

    for (int i = n - 1; i >= 0; i--) {
        swap(arr[0], arr[i]);
        heapify(arr, i, 0);
    }
}

int main() {
    int arr[10];
    cout << "Enter 10 numbers: ";
    for (int i = 0; i < 10; i++) {
        cin >> arr[i];
    }

    heapSort(arr, 10);

    cout << "Sorted array: ";
    for (int i = 0; i < 10; i++) {
        cout << arr[i] << " ";
    }
}
```

```
}  
cout << endl;  
  
return 0;  
}
```

Output

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  
  
Enter 10 numbers: 10 20 20 1 0 1 21 50 1 0  
Sorted array: 0 0 1 1 1 10 20 20 21 50  
[1] + Done "/usr/bin/gdb" --interpreter=mi --tty=${DbgTerm} C  
MIEngine-Out-5b4yp4ua.ih5"  
alright@alright:~/Desktop/DSA$
```