PROGRAM 10

Sort a given set of N integer elements using Heap Sort technique and compute its time taken.

//Code

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

void heap(int a[], int n) {
  for (int i = n / 2; i > 0; i--) {
     int k = i, v = a[k], heap = 0;
     while (!heap && (2 * k <= n)) {
        int j = 2 * k;
        if (j < n && a[j] < a[j + 1])
           j++;
        if (v >= a[j])
           heap = 1;
        else {
           a[k] = a[j];
           k = j;
        }
     }
     a[k] = v;
  }
}

void sort(int a[], int n) {
  for (int k = n; k >= 1; k--) {
     int max = a[1], j = 1;
     for (int i = 1; i <= k; i++) {
        if (max < a[i]) {
           max = a[i];
```

```
            j = i;
          }
        }
        swap(a[1], a[j]);
        swap(a[1], a[k]);
    }
}

int main() {
    int n;
    cout << "Enter n: ";
    cin >> n;
    int a[n];
    cout << "Enter elements: ";
    for (int i = 1; i <= n; i++)
        cin >> a[i];
    clock_t start = clock();
    heap(a, n);
    sort(a, n);
    cout << "Sorted: ";
    for (int i = 1; i <= n; i++)
        cout << a[i] << " ";
    cout << endl
         << "Time: " << (clock() - start) << " clock cycles " << endl;
}
```

//Output

```
> clang++-7 -pthread -std=c++17 -o main main.cpp
> ./main
Enter n: 6
Enter elements:
76
23
98
1
54
33
Sorted: 1 23 33 54 76 98
Time: 47 clock cycles
>
```