```cpp
1: /*-------Heap Sort( O(nlogn) for all cases )--------*/
2:
3: #include<iostream>
4: using namespace std;
5:
6: void inputArray(int arr[], int n)
7: {
8:     cout << "Enter the elements of your array: \n";
9:     for(int i = 0; i < n; i++)
10:     {
11:         cin >> arr[i];
12:     }
13: }
14:
15: void printArray(int arr[], int n)
16: {
17:     for(int i = 0; i < n; i++)
18:     {
19:         cout << arr[i] << " ";
20:     }
21: }
22:
23: void swap(int arr[], int i, int j)
24: {
25:     int temp = arr[i];
26:     arr[i] = arr[j];
27:     arr[j] = temp;
28: }
29:
30: void heapify(int arr[], int n, int i)
31: {
32:     int left_child = 2 * i + 1;
33:     int right_child = 2 * i + 2;
34:     int large = i;
35:
36:     if(left_child < n && arr[left_child] > arr[large])
37:     {
38:         large = left_child;
39:     }
40:     if(right_child < n && arr[right_child] > arr[large])
41:     {
42:         large = right_child;
43:     }
44:
45:     if(large != i)
46:     {
```

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47:            swap(arr, large, i);
48:            heapify(arr, n, large);
49:        }
50:
51: }
52:
53: void buildHeap(int arr[], int n)
54: {
55:     for(int i = (n / 2) - 1; i >= 0; i--)
56:     {
57:         heapify(arr, n, i);
58:     }
59: }
60:
61: void heapSort(int arr[], int n)
62: {
63:     buildHeap(arr, n);
64:     for(int i = n - 1; i >= 0 ; i--)
65:     {
66:         swap(arr, i, 0);
67:         heapify(arr, i, 0);
68:     }
69: }
70:
71: int main()
72: {
73:     int n;
74:     cout << "Enter the length: \n";
75:     cin >> n;
76:
77:     int arr[n];
78:     inputArray(arr, n);
79:
80:     heapSort(arr, n);
81:
82:     cout << "Sorted array is: \n";
83:     printArray(arr, n);
84:
85:     return 0;
86: }
```