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**Practical - 5**

**CODE**

#include<bits/stdc++.h>

using namespace std;

class HeapSort {

    vector<int> arr;

    void heapify(int n, int i, bool ascending) {

        int extreme = i;

        int left = 2\*i + 1;

        int right = 2\*i + 2;

        if (ascending) {

            if (left < n && arr[left] > arr[extreme])

                extreme = left;

            if (right < n && arr[right] > arr[extreme])

                extreme = right;

        } else {

            if (left < n && arr[left] < arr[extreme])

                extreme = left;

            if (right < n && arr[right] < arr[extreme])

                extreme = right;

        }

        if (extreme != i) {

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

            heapify(n, extreme, ascending);

        }

    }

public:

    HeapSort(vector<int> input) {

        arr = input;

    }

    vector<int> sort(bool ascending = true) {

        int n = arr.size();

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

            heapify(n, i, ascending);

        for (int i = n - 1; i > 0; i--) {

            swap(arr[0], arr[i]);

            heapify(i, 0, ascending);

        }

        return arr;

    }

};

int main() {

    vector<int> nums = {10, 3, 76, 34, 23, 32};

    HeapSort sorter(nums);

    vector<int> asc = sorter.sort(true);

    cout << "Ascending Order: ";

    for (int num : asc) cout << num << " ";

    cout << endl;

    HeapSort sorter2(nums);

    vector<int> desc = sorter2.sort(false);

    cout << "Descending Order: ";

    for (int num : desc) cout << num << " ";

    cout << endl;

    return 0;

}

**OUTPUT**

