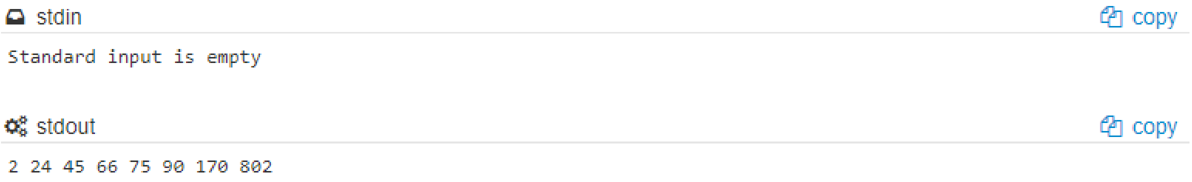
RADIX SORT

Code:

```
#include <iostream>
using namespace std;
int getMax(int arr[], int n)
{
        int mx = arr[0];
        for (int i = 1; i < n; i++)
                if (arr[i] > mx)
                        mx = arr[i];
        return mx;
}
void countSort(int arr[], int n, int exp)
{
        int output[n];
        int i, count[10] = { 0 };
        for (i = 0; i < n; i++)
                count[(arr[i] / exp) % 10]++;
        for (i = 1; i < 10; i++)
                count[i] += count[i - 1];
        for (i = n - 1; i >= 0; i--) {
                output[count[(arr[i] / exp) % 10] - 1] = arr[i];
                count[(arr[i] / exp) % 10]--;
        }
        for (i = 0; i < n; i++)
                arr[i] = output[i];
}
void radixsort(int arr[], int n)
{
        int m = getMax(arr, n);
        for (int exp = 1; m / exp > 0; exp *= 10)
                countSort(arr, n, exp);
}
void print(int arr[], int n)
{
        for (int i = 0; i < n; i++)
                cout << arr[i] << " ";
}
int main()
{
        int arr[] = { 170, 45, 75, 90, 802, 24, 2, 66 };
        int n = sizeof(arr) / sizeof(arr[0]);
        radixsort(arr, n);
        print(arr, n);
        return 0;
}
```

Output:



```
Standard input is empty
```

```
2 24 45 66 75 90 170 802
```

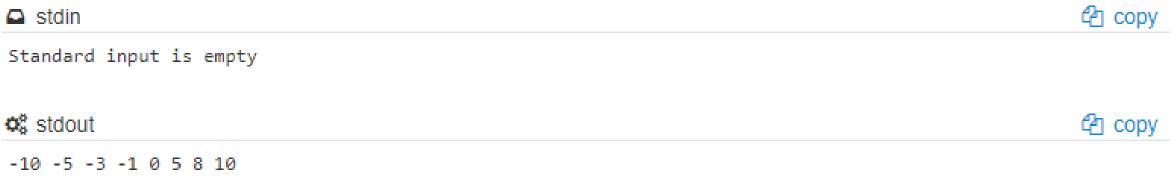
COUNTING SORT

Code:

```
#include <algorithm>
#include <iostream>
#include <vector>
using namespace std;
void countSort(vector<int>& arr)
{
        int max = *max_element(arr.begin(), arr.end());
```

```
    int min = *min_element(arr.begin(), arr.end());
    int range = max - min + 1;
    vector<int> count(range), output(arr.size());
    for (int i = 0; i < arr.size(); i++)
        count[arr[i] - min]++;
    for (int i = 1; i < count.size(); i++)
        count[i] += count[i - 1];
    for (int i = arr.size() - 1; i >= 0; i--) {
        output[count[arr[i] - min] - 1] = arr[i];
        count[arr[i] - min]--;
    }
    for (int i = 0; i < arr.size(); i++)
        arr[i] = output[i];
}
void printArray(vector<int>& arr)
{
    for (int i = 0; i < arr.size(); i++)
        cout << arr[i] << " ";
    cout << "\n";
}
int main()
{
    vector<int> arr = { -5, -10, 0, -3, 8, 5, -1, 10 };
    countSort(arr);
    printArray(arr);
    return 0;
}
```

Output:



```
Standard input is empty
```

```
-10 -5 -3 -1 0 5 8 10
```