

Q2 Find the maximum & minimum element in the array.

i/p $\rightarrow \{1, 2, 6, -2, 36, 10\}$

o/p $\rightarrow \text{maxi}^{\circ} = 36$

$\text{mini}^{\circ} = -2$

The approach will be that we will be traversing the whole array. Initially we have maxi° as INT_MIN and mini° as INT_MAX. While traversing the array if we found any element greater than current maxi° , then update maxi° & if we found any element lesser than current mini° , then update mini° . After the array is traversed, simply display maxi° & mini° .

Dry run

1) $\{1, 2, 6, -2, 36, 10\}$

$\text{mini}^{\circ} = \text{INT_MAX}$

$\text{maxi}^{\circ} = \text{INT_MIN}$

$i^{\circ} = 0$

$\text{arr}[i^{\circ}] > \text{maxi}^{\circ} \rightarrow \text{True}$ $\text{maxi}^{\circ} = \text{arr}[i^{\circ}]$

$\text{arr}[i^{\circ}] < \text{mini}^{\circ} \rightarrow \text{True}$ $\text{mini}^{\circ} = \text{arr}[i^{\circ}]$

2) $\text{mini}^{\circ} = \pm$

$\text{maxi}^{\circ} = \pm$

$i^{\circ} = \pm$

$\text{arr}[i^{\circ}] > \text{maxi}^{\circ} \rightarrow \text{True}$ $\text{maxi}^{\circ} = \text{arr}[i^{\circ}]$

$\text{arr}[i^{\circ}] < \text{mini}^{\circ} \rightarrow \text{False}$ Do nothing

$$3) \text{mini} = 1$$

$$\text{maxi} = 2$$

$$i = 2 \rightarrow 2$$

$\text{arr}[i] > \text{maxi} \rightarrow \text{True}$ $\Rightarrow \text{maxi} = \text{arr}[i]$

$\text{arr}[i] < \text{mini} \rightarrow \text{False}$ $\Rightarrow \text{Do nothing}$

$$4) \text{mini} = 1$$

$$\text{maxi} = 6$$

$$i = 3 \rightarrow 3$$

$\text{arr}[i] > \text{maxi} \rightarrow \text{False}$ $\Rightarrow \text{Do nothing}$

$\text{arr}[i] < \text{mini} \rightarrow \text{True}$ $\Rightarrow \text{mini} = \text{arr}[i]$

$$5) \text{mini} = -2$$

$$\text{maxi} = 6$$

$$i = 4 \rightarrow 4$$

$\text{arr}[i] > \text{maxi} \rightarrow \text{True}$ $\Rightarrow \text{maxi} = \text{arr}[i]$

$\text{arr}[i] < \text{mini} \rightarrow \text{False}$ $\Rightarrow \text{Do nothing}$

$$6) \text{mini} = -2$$

$$\text{maxi} = 36$$

$$i = 5$$

$\text{arr}[i] > \text{maxi} \rightarrow \text{False}$ } $\Rightarrow \text{Do nothing}$

$\text{arr}[i] < \text{mini} \rightarrow \text{False}$ }

Hence now we have traversed the whole array & hence

$$\text{maxi} = 36$$

$$\text{mini} = -2$$

Code

Void findMin and Max (vector<int>&arr){

```
int mini = INT_MAX;  
int maxi = INT_MIN;  
for (int i=0; i<arr.size(); i++) {  
    if (arr[i] > maxi)  
        maxi = arr[i];  
    if (arr[i] < mini)  
        mini = arr[i];  
}  
cout << "Maxi = " << maxi << endl;  
cout << "Min = " << mini << endl;
```

Time complexity = $O(n)$ → One time traversal
Space complexity = $O(1)$ → No extra space taken