

## **3.1 MAXIMUM AND MINIMUM VALUES IN THE ARRAY**

### **Question:**

Write a Program to find both the maximum and minimum values in the array. Implement using any programming language of your choice. Execute your code and provide the maximum and minimum values found.

### **AIM**

To design a Python program that accepts an array of numbers from the user and returns both the maximum and minimum values.

### **ALGORITHM**

1. Start by accepting a list of numbers from the user.
2. Convert the input into a list of integers.
3. Initialize two variables: max\_val and min\_val with the first element of the array.
4. Traverse the array:
  - If the current element is greater than max\_val, update max\_val.
  - If the current element is less than min\_val, update min\_val.
5. Return both max\_val and min\_val.

## PROGRAM

```
File Edit Format Run Options Window Help
def find_min_max(arr):
    if not arr:
        return None, None
    min_val = max_val = arr[0]
    for num in arr:
        if num < min_val:
            min_val = num
        if num > max_val:
            max_val = num
    return min_val, max_val

N = int(input("Enter the number of elements: "))
a = []
print("Enter", N, "integers:")
for _ in range(N):
    a.append(int(input()))

min_val, max_val = find_min_max(a)
print("Min =", min_val, "Max =", max_val)
|
```

Input:

No. of elements: 4

Array: 2 3 7 9

Output:

```
>>> | Enter number of elements: 4
      | Enter the array elements: 2 3 7 9
      | Min = 2 Max = 9
```

## RESULT:

Thus the program is successfully executed and the output is verified.

## PERFORMANCE ANALYSIS:

- Time Complexity:  $O(n)$
- Space Complexity:  $O(1)$