Exp-3.1

Title:

Finding Maximum and Minimum Values in an Array

Aim:

To design and implement a program to find both the maximum and minimum values in a given array using Python.

Algorithm

1. Start.
2. Take input for the size of the array, N.
3. Take input for the array elements.
4. Initialize `max` and `min` with the first element of the array.
5. Traverse the array:
    - If the current element is greater than `max`, update `max`.
    - If the current element is less than `min`, update `min`.
6. Print the maximum and minimum values.
7. Stop.

Input:

Enter number of elements: 8

Enter the array elements: 5 7 3 4 9 12 6 2

Output:

Min = 2, Max = 12

Program:

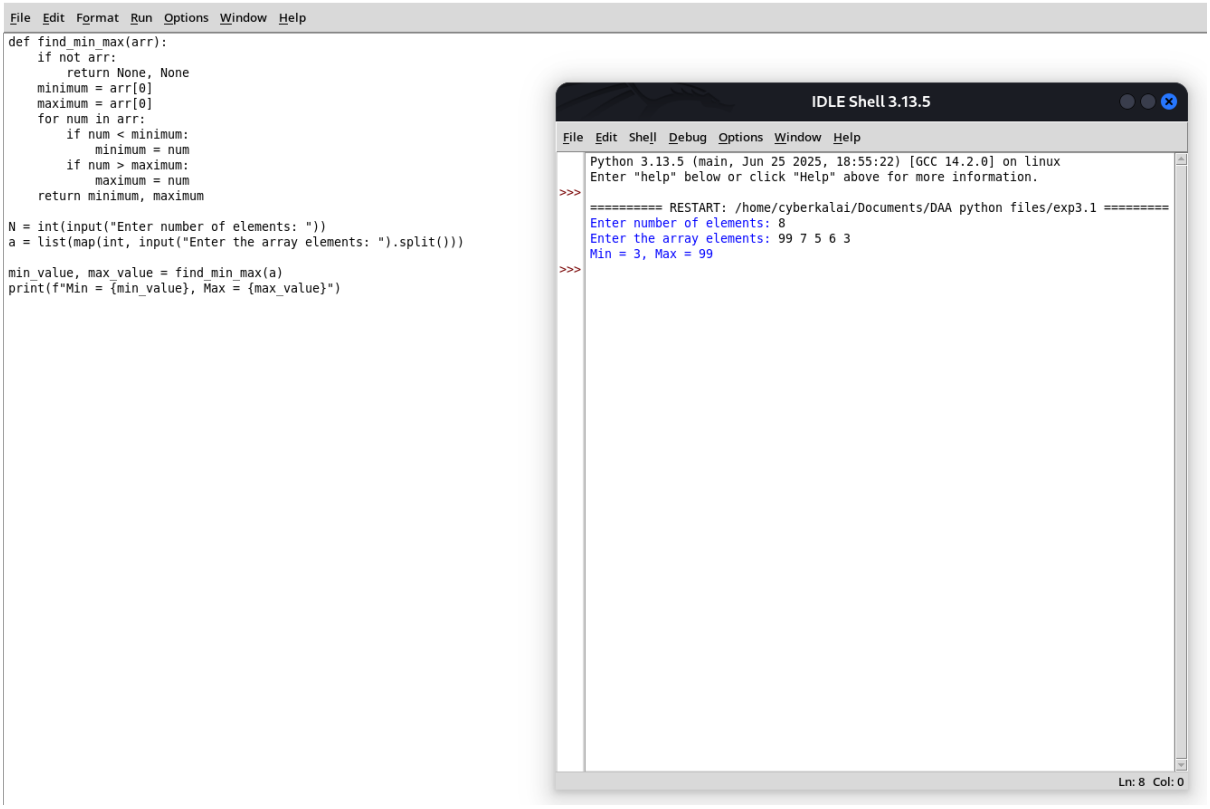
```
def find_min_max(arr):
    if not arr:
        return None, None
    minimum = arr[0]
    maximum = arr
    for num in arr:
        if num < minimum:
            minimum = num
        if num > maximum:
            maximum = num
    return minimum, maximum
N = int(input("Enter number of elements: "))
a = list(map(int, input("Enter the array elements: ").split()))

min_value, max_value = find_min_max(a)
print(f"Min = {min_value}, Max = {max_value}")
```

Performance Analysis:

Time Complexity: O(n)

Space Complexity: O(1)

Program Output:



Result:

Thus, the given program to find both the maximum and minimum values in the array is executed and got output successfully for user input.