

EX-1.5

Title :

Write a program FOR THE BELOW TEST CASES with least time complexity

Aim:

To design and implement a Python program to find the maximum element in an array.

Procedure:

1. Read input size n.
2. Read n space-separated integers as the array elements.
3. Initialize a variable `max_val` to the first element of the array.
4. Traverse the array:
 - Compare each element with `max_val`.
 - If greater, update `max_val`.
5. Print the `max_val` as result.

Algorithm:

1. Start
2. Read n
3. Read n integers into array arr
4. Initialize $max_val = arr[0]$
5. For each element num in arr :
 - If $num > max_val$, update max_val
6. Print max_val
7. Stop

Input:

5

1 2 3 4 5

Output:

5

Program :

```
def findMaximum(arr):  
    max_val = arr  
    for num in arr:  
        if num > max_val:  
            max_val = num  
    return max_val  
  
n = int(input("Enter size of array: "))  
arr = list(map(int, input("Enter array elements: ").split()))  
  
result = findMaximum(arr)  
print("Maximum element in the array:", result)
```

Performance Analysis:

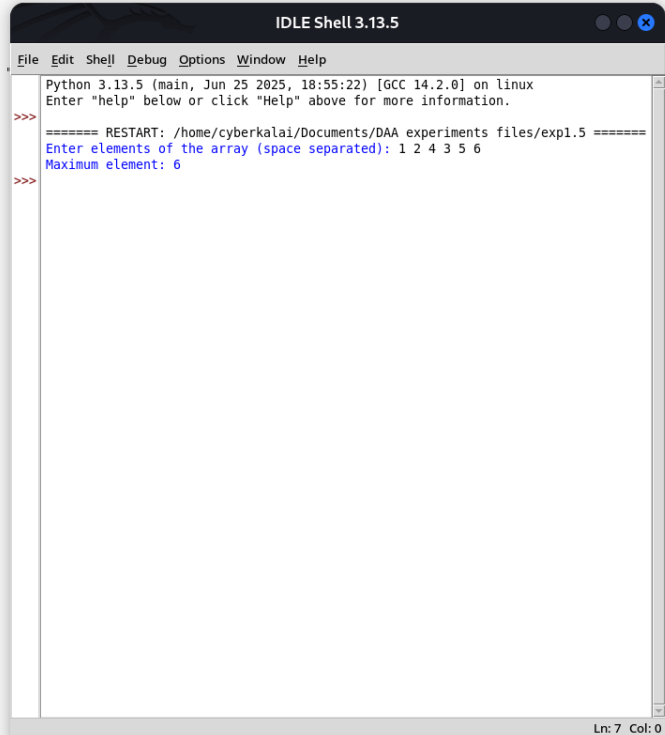
Time Complexity: $O(n)$, entire array scanned once

Space Complexity: $O(1)$, only one variable (max_val) used

program output:

File Edit Format Run Options Window Help

```
def find_max(nums):  
    max_num = nums[0]  
    for num in nums[1:]:  
        if num > max_num:  
            max_num = num  
    return max_num  
  
nums = list(map(int, input("Enter elements of the array (space separated):  
result = find_max(nums)  
print("Maximum element:", result)
```



```
Python 3.13.5 (main, Jun 25 2025, 18:55:22) [GCC 14.2.0] on linux  
Enter "help" below or click "Help" above for more information.  
  
>>> ===== RESTART: /home/cyberkalai/Documents/DAA experiments files/exp1.5 =====  
>>> Enter elements of the array (space separated): 1 2 4 3 5 6  
>>> Maximum element: 6  
  
Ln: 7 Col: 0
```

Result :

Thus the given program Maximum Element is executed and got output successfully.