EX-1.6

Title :

Write a program to sort a list using an efficient sorting algorithm and then find the maximum element from the sorted list.

Aim:

To design and implement a Python program to sort a list and find the maximum element from the sorted list.

Procedure:

1. Take input size n (number of elements).
2. If `n = 0`, print an appropriate message and stop.
3. Read n elements into an array.
4. Sort the array using an efficient algorithm (Python uses Timsort: O(n log n)).
5. Return the last element in the sorted array as the maximum.
6. Print the result.

Algorithm:

1. Start
2. Read n
3. If `n = 0`, print "List is empty" and stop.
4. Read n numbers into array `arr`.
5. Sort array `arr` (using Timsort).
6. Assign `max_val = arr[-1]`.
7. Print `max_val`.
8. Stop

Input/Output:

ip -0

o/p -List is empty

i/p -

1

5

o/p – 5

i/p -

5

3 3 3 3 3

o/p – 3

Program :

```
def findMaxAfterSorting(arr):
    if len(arr) == 0:
        return None
    sorted_arr = sorted(arr)  # Efficient sorting (Timsort: O(n log n))
    return sorted_arr[-1]
n = int(input("Enter size of list: "))
if n == 0:
    print("List is empty")
else:
    arr = list(map(int, input("Enter list elements: ").split()))
    result = findMaxAfterSorting(arr)
    print("Maximum element after sorting:", result)
```

Performance Analysis:

Time Complexity: O(n log n)

Space Complexity: O(n)

program output:

```
File  Edit  Format  Run  Options  Window  Help
def sort_and_find_max(nums):
    if not nums:
        return None

    nums.sort()
    return nums[-1]

input_str = input("Enter elements of the array (space separated): ").strip()
if input_str:
    nums = list(map(int, input_str.split()))
else:
    nums = []

max_element = sort_and_find_max(nums)

if max_element is None:
    print("List is empty.")
else:
    print("Maximum element:", max_element)
```

```
IDLE Shell 3.13.5
File  Edit  Shell  Debug  Options  Window  Help
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/exp1.6 =======
Enter elements of the array (space separated):
List is empty.
>>>
======= RESTART: /home/cyberkalai/Documents/DAA experiments files/exp1.6 =======
Enter elements of the array (space separated): 5
Maximum element: 5
>>>
======= RESTART: /home/cyberkalai/Documents/DAA experiments files/exp1.6 =======
Enter elements of the array (space separated): 3 3 3 3 1 3 6 3 3 3
Maximum element: 6
>>>
Ln: 15  Col: 0
```

Result :

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