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Python program to find second largest number in a list

Given a list of numbers, the task is to write a Python program to find the second largest number in given list.

Examples:

Input : list1 = [10, 20, 4]

Output : 10

Input : list2 = [70, 11, 20, 4, 100]

Output : 70

Method 1: Sorting is an easier but less optimal method. Given below is an $O(n)$ algorithm to do the same.

```
1 # Python program to find second largest
2 # number in a list
3
4 # list of numbers - length of list should be at least 2
5 list1 = [10, 20, 30]
6
7 max=max(list1[0],list1[1])
8 secondmax=min(list1[0],list1[1])
9
10 for i in range(2,len(list1)):
11     if list1[i]>max:
12         secondmax=max
13         max=list1[i]
14     else:
15         if list1[i]>secondmax:
16             secondmax=list1[i]
17
18 print("Second highest number is : ",str(secondmax))
19
```

> Second highest number is : 20

Method 2 : Sort the list in ascending order and print the second last element in the list.

```
# Python program to find largest
# number in a list

# list of numbers
list1 = [10, 20, 4, 45, 99]

# sorting the list
list1.sort()

# printing the second last element
print("Second largest element is:", list1[-2])
```

Output:

Largest element is: 45

Method 3 : By removing the max element from list

```
# Python program to find second largest
# number in a list

# list of numbers
list1 = [10, 20, 4, 45, 99]
```



```
# new_list is a set of list1
new_list = set(list1)

# removing the largest element from temp list
new_list.remove(max(new_list))

# elements in original list are not changed
# print(list1)

print(max(new_list))
```

Output:

Largest element is: 45

Method 3 : Find max list element on inputs provided by user

```
# Python program to find second largest
# number in a list

# creating empty list
list1 = []

# asking number of elements to put in list
num = int(input("Enter number of elements in list: "))

# iterating till num to append elements in list
for i in range(1, num + 1):
    ele = int(input("Enter elements: "))
    list1.append(ele)

...

# sort the list
list1.sort()

# print second maximum element
print("Second largest element is:", list1[-2])

...

# print second maximum element using sorted() method
print("Second largest element is:", sorted(list1)[-2])
```

Output:

```
Enter number of elements in list: 4
Enter elements: 12
Enter elements: 19
Enter elements: 1
Enter elements: 99
Largest element is: 19
```

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