1. Write a program that asks the user to enter a list of at least five integers. Do the following:
(a) Print out the total number of items in the list.
(b) Print out the fourth item (index 3) in the list.
(c) Print out the last three items in the list.
(d) Print out all the items in the list except the first two.
(e) Print out the list in reverse order.
(f) Print out the largest and smallest values in the list.
(g) Print out the sum of all the values in the list.
(h) If the list contains a zero, print out the index of the first zero in the list, and otherwise print out a message saying there are no zeroes.
(i) Sort the list and print out the list after sorting.
(j) Delete the first item from the (now sorted) list and print out the new list.
(k) Change the second-to-last item in the list to 9876 and print out the new list.
(l) Append the value -500 to the end of the list and print out the new list.

---------------------Solution-----------------------------------

```python
# (a) Ask the user to enter a list of integers
user_input = input("Enter at least five integers, separated by spaces: ")
integer_list = [int(num) for num in user_input.split()]

# (b) Print out the total number of items in the list
print("Total number of items in the list:", len(integer_list))

# (c) Print out the fourth item (index 3) in the list
print("Fourth item in the list:", integer_list[3])

# (d) Print out the last three items in the list
print("Last three items in the list:", integer_list[-3:])

# (e) Print out all the items in the list except the first two
print("Items in the list except the first two:", integer_list[2:])

# (f) Print out the largest and smallest values in the list
print("Largest value:", max(integer_list))
print("Smallest value:", min(integer_list))

# (g) Print out the sum of all the values in the list
print("Sum of all values in the list:", sum(integer_list))

# (h) If the list contains a zero, print out the index of the first zero
in the list,
#     otherwise print out a message saying there are no zeroes
if 0 in integer_list:
    print("Index of the first zero in the list:", integer_list.index(0))
else:
    print("There are no zeroes in the list")

# (i) Sort the list and print out the list after sorting
sorted_list = sorted(integer_list)
print("List after sorting:", sorted_list)
```

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# (j) Delete the first item from the (now sorted) list and print out the
new list
del sorted_list[0]
print("New list after deleting the first item:", sorted_list)

# (k) Change the second-to-last item in the list to 9876 and print out
the new list
sorted_list[-2] = 9876
print("New list after changing the second-to-last item:", sorted_list)

# (l) Append the value -500 to the end of the list and print out the new
list
sorted_list.append(-500)
print("New list after appending -500:", sorted_list)
```


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2. Write a program that asks the user to enter a list of numbers. Then
print out the smallest thing in the list and the first index at which it
appears in the list.

--------------------SOLUTION---

```
def find_smallest(numbers):
    smallest = min(numbers)
    index = numbers.index(smallest)
    return smallest, index

# Prompt the user to enter a list of numbers
numbers = input("Enter a list of numbers, separated by spaces: ").split()

# Convert the input into a list of integers
numbers = [int(num) for num in numbers]

# Find the smallest number and its index
smallest, index = find_smallest(numbers)

# Print the smallest number and its index
print("Smallest number:", smallest)
print("Index:", index)
```


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3. Write a program that asks the user to enter a string of lowercase letters and creates a list containing counts of how many times each letter appears in the string. The first index is how many a's are in the string, the second is how many b's, etc.

---------------------SOLUTION---

```python
def count_letters(string):
    counts = [0] * 26  # Initialize a list of counts with 26 elements,
each set to 0

    for char in string:
        if char.islower():  # Check if the character is a lowercase
letter
            index = ord(char) - ord('a')  # Calculate the index based on
the ASCII value of the character
            counts[index] += 1  # Increment the count at the
corresponding index

    return counts


# Main program
input_string = input("Enter a string of lowercase letters: ")
letter_counts = count_letters(input_string)

for i, count in enumerate(letter_counts):
    letter = chr(ord('a') + i)  # Get the corresponding letter for the
current index
    print(f"Number of {letter}'s: {count}")
```


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4. Create a dictionary whose keys are the strings 'abc', 'def', 'ghi', 'jkl', and 'mno' and whose corresponding values are 7, 11, 13, 17, and 19. Then write dictionary code that does the following:
(a) Print the value in the dictionary associated with the key 'def'.
(b) Use the keys() method to print out all the keys.
(c) Loop over the dictionary and print out all the keys and their associated values.
(d) Use an if statement to check if the dictionary contains the key 'pqr' and print out an appropriate
message indicating whether it does or doesn't.
(e) Change the value associated with the key 'abc' to 23 and then print out all the values in the
dictionary using the values() method.

--------------------SOLUTION---

```python
dictionary = {'abc': 7, 'def': 11, 'ghi': 13, 'jkl': 17, 'mno': 19}

# (a) Print the value associated with the key 'def'
print(dictionary['def'])

# (b) Print all the keys using keys() method
print(dictionary.keys())

# (c) Loop over the dictionary and print keys and their associated values
for key, value in dictionary.items():
    print(key, value)

# (d) Check if the dictionary contains the key 'pqr' and print an
appropriate message
if 'pqr' in dictionary:
    print("The dictionary contains the key 'pqr'.")
else:
    print("The dictionary does not contain the key 'pqr'.")

# (e) Change the value associated with the key 'abc' to 23 and print all
the values using values() method
dictionary['abc'] = 23
print(dictionary.values())
```