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Q1. Write a program to count and display the number of capital letters in a given string.

```
text = input("Enter a string: ")

count = 0

for char in text:
    if char.isupper():
        count += 1

print("Number of capital letters:", count)
```

Q2. Count total number of vowels in a given string.

```
text = "Hello, how are you?"

vowels = "aeiouAEIOU"

count = sum(1 for char in text if char in vowels)

print("Total number of vowels:", count)
```

Total number of vowels: 7

Q3. Input a sentence and print words in separate lines.

```
sentence = input("Enter a sentence: ")

words = sentence.split()

for word in words:
    print(word)
```

Enter a sentence: vivan is boy
vivan
is
boy

Q4. WAP to enter a string and a substring. You have to print the number of times that the substring occurs in the given string. String traversal will take place from left to right, not from right to left. Sample Input ABCDCDC CDC Sample Output 2

```
string = input("Enter the string: ")
substring = input("Enter the substring: ")

count = 0
len_sub = len(substring)

for i in range(len(string) - len_sub + 1):
    if string[i:i+len_sub] == substring:
        count += 1

print("Number of times substring occurs:", count)
```

Enter the string: ABCDCDC
Enter the substring: CDC
Number of times substring occurs: 2

Q5. Given a string containing both upper and lower case alphabets. Write a Python program to count the number of occurrences of each alphabet (case insensitive) and display the same. Sample Input ABaBCbGc Sample Output 2A 3B 2C 1G

```
string = input("Enter a string: ")

string = string.upper()

count_dict = {}

for char in string:
    if char.isalpha():
        if char in count_dict:
            count_dict[char] += 1
        else:
            count_dict[char] = 1

for char, count in count_dict.items():
    print(f"{count}{char}")
```

```
Enter a string: ABaBCbGc
2A
3B
2C
1G
```

Q6. Program to count number of unique words in a given sentence using sets.

```
sentence = input("Enter a sentence: ")

words = sentence.split()

unique_words = set(words)

print("Number of unique words:", len(unique_words))
```

```
Enter a sentence: hello world hello python
Number of unique words: 3
```

Q7. Create 2 sets s1 and s2 of n fruits each by taking input from user and find: a) Fruits which are in both sets s1 and s2 b) Fruits only in s1 but not in s2 c) Count of all fruits from s1 and s2

```
n = int(input("Enter the number of fruits in each set: "))

s1 = set()
print("Enter fruits for set s1:")
for _ in range(n):
    fruit = input().strip()
    s1.add(fruit)

s2 = set()
print("Enter fruits for set s2:")
for _ in range(n):
    fruit = input().strip()
    s2.add(fruit)

common_fruits = s1 & s2
print("Fruits in both sets:", common_fruits)

only_in_s1 = s1 - s2
print("Fruits only in s1:", only_in_s1)

all_fruits = s1 | s2
print("Total number of unique fruits from both sets:", len(all_fruits))
```

```

Enter the number of fruits in each set: 3
Enter fruits for set s1:
apple
banana
mango
Enter fruits for set s2:
banana
grape
mango
Fruits in both sets: {'mango', 'banana'}
Fruits only in s1: {'apple'}
Total number of unique fruits from both sets: 4

```

Q8.Take two sets and apply various set operations on them : S1 = {Red ,yellow, orange , blue } S2 = {violet, blue , purple}

```

S1 = {"Red", "yellow", "orange", "blue"}
S2 = {"violet", "blue", "purple"}

union_set = S1 | S2
print("Union:", union_set)

intersection_set = S1 & S2
print("Intersection:", intersection_set)

difference_set = S1 - S2
print("Difference (S1 - S2):", difference_set)

difference_set2 = S2 - S1
print("Difference (S2 - S1):", difference_set2)

symmetric_diff = S1 ^ S2
print("Symmetric Difference:", symmetric_diff)

print("Is S1 a subset of S2?", S1 <= S2)

print("Is S1 a superset of S2?", S1 >= S2)

Union: {'yellow', 'Red', 'purple', 'orange', 'violet', 'blue'}
Intersection: {'blue'}
Difference (S1 - S2): {'orange', 'Red', 'yellow'}
Difference (S2 - S1): {'violet', 'purple'}
Symmetric Difference: {'orange', 'yellow', 'purple', 'Red', 'violet'}
Is S1 a subset of S2? False
Is S1 a superset of S2? False

```

Github link = <https://github.com/pranavssinha11-glitch/Python.git>