EXPERIMENT NO. - 07

AIM: Edit/compile/run a program to read a string and display the total number of uppercase and lowercase letters.

THOERY:
Problem Description

The program takes a string and counts the number of lowercase letters and uppercase letters in the string.

Problem Solution

1. Take a string from the user and store it in a variable.
2. Initialize the two count variables to 0.
3. Use a for loop to traverse through the characters in the string and increment the first count variable each time a lowercase character is encountered and increment the second count variable each time a uppercase character is encountered.
4. Print the total count of both the variables.
5. Exit.

Program/Source Code

Here is source code of the Python Program to count the number of lowercase characters and uppercase characters in a string. The program output is also shown below.

```python
string=raw_input("Enter string:")
count1=0
count2=0
for i in string:
      if(i.islower()):
            count1=count1+1
      elif(i.isupper()):
            count2=count2+1
print("The number of lowercase characters is:")
print(count1)
print("The number of uppercase characters is:")
print(count2)
```

Program Explanation

1. User must enter a string and store it in a variable.
2. Both the count variables are initialized to zero.
3. The for loop is used to traverse through the characters in the string.
4. The first count variable is incremented each time a lowercase character is encountered and the second count variable is incremented each time a uppercase character is encountered.
5. The total count of lowercase characters and uppercase characters in the string are printed.

Runtime Test Cases

```
Case 1:
Enter string:HeLLo
The number of lowercase characters is:
2
The number of uppercase characters is:
3


Case 2:
Enter string: San Francisco
The number of lowercase characters is:
10
The number of uppercase characters is:
3
```

PROGRAM A)

Method 1: Using the built-in methods

```
Str="InformationTechnology"

lower=0

upper=0

for i in Str:

    if(i.islower()):

            lower+=1

    else:

            upper+=1

print("The number of lowercase characters is:",lower)

print("The number of uppercase characters is:",upper)
```

Output

```
The number of lowercase characters is: 19

The number of uppercase characters is: 2
```

Explanation:
Here we are simply using the built-in method islower() and checking for lower case characters and counting them and in the else condition we are counting the number of upper case characters provided that the string only consists of alphabets.

PROGRAM B)
Method 2: Using the ascii values, Naive Method

```
# Python3 program to count upper and

# lower case characters without using

# inbuilt functions
```

```python
def upperlower(string):


    upper = 0

    lower = 0



    for i in range(len(string)):



        # For lower letters

        if (ord(string[i]) >= 97 and

            ord(string[i]) <= 122):

            lower += 1



        # For upper letters

        elif (ord(string[i]) >= 65 and

            ord(string[i]) <= 90):

            upper += 1



    print('Lower case characters = %s' %lower,

        'Upper case characters = %s' %upper)



# Driver Code

string = 'Google Classroom for Python is a Study-portal for Students'

upperlower(string)
```

Output

Lower case characters = 44 Upper case characters = 5

Explanation:
Here we are using the ord() method to get the ascii value of that particular character and then calculating it in the particular range.

PROGRAM C)

Method 3: Calculating the characters within the given range of ascii code

```python
s = "The Knowledge King"

l,u = 0,0

for i in s:

    if (i>='a'and i<='z'):



        # counting lower case

        l=l+1

    if (i>='A'and i<='Z'):



        #counting upper case

        u=u+1


print('Lower case characters: ',l)

print('Upper case characters: ',u)
```

Output

Lower case characters: 13

Upper case characters: 3

Explanation:

Here we are iterating through the string and calculating upper and lower case characters using the ascii code range.

PROGRAM D)
Method 4: Using 'in' keyword

```python
# Python3 program to count upper and

# lower case characters without using

# inbuilt functions

string = 'Google Classroom for Python is a Study-portal for Students'

upper = 0

lower = 0

up="ABCDEFGHIJKLMNOPQRSTUVWXYZ"

lo="abcdefghijklmnopqrstuvwxyz"

for i in string:

    if i in up:

        upper+=1

    elif i in lo:

        lower+=1

print('Lower case characters = %s' %lower)

print('Upper case characters = %s' %upper)
```

Output
```
Lower case characters = 44

Upper case characters = 5
```

Explanation:
Here we have taken all the upper and lower case characters in separate strings and then count how many characters are present in individual strings.

PROGRAM E)
Method #5 : Using operator.countOf() method

```python
import operator as op

Str = "ConsistencyIsNewGrowth"

lower = "abcdefghijklmnopqrstuvwxyz"

l = 0

u = 0

for i in Str:

    if op.countOf(lower, i) > 0:

        l += 1

    else:

        u += 1

print("The number of lowercase characters is:", l)

print("The number of uppercase characters is:", u)
```

Output
```
The number of lowercase characters is: 18
The number of uppercase characters is: 4
```

Conclusion: Hence, we have successfully studied executing the program to read a string and display the total number of uppercase and lowercase letters.