Darshan UNIVERSITY

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Python Programming - 2301CS404

Lab - 5

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1) Character Category Counter

Problem: Count uppercase, lowercase, digits, and special characters in a string.

Sample Inputs & Outputs:

- Input: `Python3@Lab` → Uppercase: 2, Lowercase: 7, Digits: 1, Special: 1
- Input: `HELLO123` → Uppercase: 5, Lowercase: 0, Digits: 3, Special: 0
- Input: `hi@#9` → Uppercase: 0, Lowercase: 2, Digits: 1, Special: 2

In [4]:
```
string = input('Enter String:')
upperCount = 0; lowerCount = 0; digitCount = 0; specialCount = 0;
for i in string:
    if i.isupper():
        upperCount += 1
    elif i.islower():
        lowerCount += 1
    elif i.isdigit():
        digitCount += 1
    else:
        specialCount += 1
else:
    print(f"Uppercase:{upperCount}, Lowercase:{lowerCount}, Digits:{digitCount},
```

```
Uppercase:2, Lowercase:7, Digits:1, Special:1
```

2) Reverse Each Word

- Input: `Python is Easy` → `nohtyP si ysaE`
- Input: `Hello World` → `olleH dlroW`
- Input: `Learn Python Fast` → `nraeL nohtyP tsaF`

Using Slicing Reverse

In [12]:
```
string = input('Enter String:')
separate = string.split(" ")
reverse = ''
for i in separate:
    rev = i[::-1]
    reverse += (rev) + ' '
else:
    print(reverse)
```

```
nohtyP si ysaE
```

List Comprehension

In [15]:
```
string = input('Enter String:')
separate = string.split(" ")
ans=" ".join([i[::-1] for i in separate])
print(ans)
```

```
nohtyP si ysaE
```

3) Case Pattern Identifier

- `PYTHON` → Uppercase
- `python` → Lowercase
- `Python Programming` → Title Case

In [19]:
```
string = input('Enter String:')
if string.isupper():
    print('Upper Case')
elif string.islower():
    print('Lower Case')
elif string.istitle():
    print('Title Case')
```

```
Title Case
```

4) First and Last Occurrence Finder

- `programming` , `g` → First:3 Last:10
- `banana` , `a` → First:1 Last:5
- `hello` , `z` → Not found

In [26]:
```
string = input('Enter String:')
letter = input('Enter letter:')
if letter in string:
    print(f'{letter}-> First Occurrence: {string.index(letter)} and Last Occurre
else:
    print('Not found')
```

```
Not found
```

5) Word Frequency Counter (ignore the case)

- `Python is easy and Python is powerful` → python: 2
- `Java is popular but java is verbose` → java: 2
- `C is fast` → c:1

In [28]:
```
string = input('Enter String:')
word = input('Enter word:')
print(f'{word}: {string.count(word)}')
```

```
C: 1
```

6) Remove Extra Spaces

- `  Python   is   fun  ` → `Python is fun`
- `  Hello   World` → `Hello World`
- `NoExtraSpace` → `NoExtraSpace`

In [38]:
```
string = input('Enter String:')
string = string.strip()
l1 = string.split(" ")
print(f'{string}: {" ".join([i for i in l1 if i != ""])}')
```

```
Hello    World: Hello World
```

7) Prefix and Suffix Removal

- `unhappy.txt` → `happy`
- `pretest.py` → `test`
- `unwanted.doc` → `wanted`

In [40]:
```
string = input('Enter String:')
prefix = input('Enter prefix:')
suffix = input('Enter suffix:')
string = string.lstrip(prefix)
string = string.rstrip(suffix)
print(string)
```

```
happy
```

8) Replace Vowels

- `Programming` → `Pr*gr*mm*ng`
- `Education` → `*d*c*t**n`
- `Sky` → `Sky`

In [44]:
```
string = input('Enter String:')
# result = ''
# for i in string:
#     if i == 'a' or i == 'e' or i == 'i' or i == 'o' or i == 'u' or i == 'A' or
#         result += '*'
#     else:
#         result += i
# else:
#     print(result)
```

```
for i in string:
    if i == 'a' or i == 'e' or i == 'i' or i == 'o' or i == 'u' or i == 'A' or i
        string = string.replace(i,'*')
else:
    print(string)
```

```
Pr*gr*mm*ng
```

9) String Compression

- `aaabbcccc` → `a3b2c4`
- `xxxyyyz` → `x3y3z1`
- `abcd` → `a1b1c1d1`

In [12]:
```
string = input('Enter String: ')
result = ''
count = 1

for i in range(len(string)):
    if i < len(string) - 1 and string[i] == string[i + 1]:
        count += 1
    else:
        result += string[i] + str(count)
        count = 1

print(f"{string}: {result}")
```

```
aaabbcccc: a3b2c4
```

10) Toggle Case (without using str.swapcase())

- `PyThOn` → `pYtHoN`
- `HELlo` → `helLO`
- `Python` → `pYTHON`

In [8]:
```
string = input("Enter string: ")
result = ""

for char in string:
    if char.isupper():
        result += char.lower()
    elif char.islower():
        result += char.upper()
    else:
        result += char

print(f"Toggled: {result}")
```

```
Toggled: pYtHoN
```

11) Username Validation

valid username rules:

1. only alphabets and digits
2. does not start with a digit

3. length ≥ 6

- `User123` → Valid
- `123User` → Invalid
- `Us@12` → Invalid

In [1]:
```
username = input('Enter Username:')
if len(username) >= 6 and username[0].isalpha() and username.isalnum():
    print(f"{username} is Valid")
else:
    print(f"{username} is Invalid")
```

```
User123 is Valid
```

12) Palindrome Checker (ignore the case)

- `Madam` → Palindrome
- `Level` → Palindrome
- `Python` → Not Palindrome

In [59]:
```
string = input('Enter String:')
string = string.lower()
result = 'Palindrome' if string == string[::-1] else 'Not Palindrome'
print(result)
```

```
Palindrome
```

13) Longest Word Finder

- `Python programming is interesting` → programming
- `I love coding` → coding
- `Data structures and algorithms` → structures

In [50]:
```
string = input('Enter String:')
max_length = 0; ans = ''
str_split = string.split(' ')
for i in str_split:
    if len(i) > max_length:
        max_length = len(i)
        ans = i
print(f'{string}: {ans}')
```

```
I love coding: coding
```

14) Case Conversion

- `python programming`
  - Upper: PYTHON PROGRAMMING
  - Lower: python programming
  - Title: Python Programming
  - Capitalize: Python programming

In [45]:
```
string = input('Enter String:')
print(f'Upper: {string.upper()}')
```

```
print(f'Lower: {string.lower()}')
print(f'Title: {string.title()}')
print(f'Capitalize: {string.capitalize()}')
```

```
Upper: PYTHON PROGRAMMING
Lower: python programming
Title: Python Programming
Capitalize: Python programming
```

15) Custom Split

- `apple,banana,grape`
- `10|20|30`
- `A-B-C-D`

In [47]:
```
string = input('Enter String:')
custom_split = input('split:')
print(f'Custom Split: {string.split(custom_split)}')
```

```
Custom Split: ['10', '20', '30']
```