

# Practice

September 10, 2023

Q1) Write a function to count the number of characters, alphabets, digits, and spaces

```
[1]: def calc_stuff(string:str) -> dict[str, int]:
    res = {'char':0, 'alpha':0, 'digit':0, 'space':0}

    for c in string:
        res['char'] += 1
        # Check if it is an alphabet
        if c.isalpha(): res['alpha'] += 1
        # Check if it is a digit
        if c.isdigit(): res['digit'] += 1
        # Check if it is a whitespace
        if c.isspace(): res['space'] += 1

    return res

x = input('Enter a sentence: ')
x_data = calc_stuff(x)

print(f'Information about "{x}":')
print(f'Number of characters:  {x_data["char"]}')
print(f'Number of alphabets:   {x_data["alpha"]}')
print(f'Number of digits:      {x_data["digit"]}')
print(f'Number of whitespaces: {x_data["space"]}')
```

Enter a sentence: if the music is right 78

Information about "if the music is right 78":

Number of characters: 24

Number of alphabets: 17

Number of digits: 2

Number of whitespaces: 5

Q2) Write a menu driven program for the following: 1. Display average of all numbers entered by the user 2. Display the squares of 5 numbers entered by the user

```
[2]: def node_1() -> None:
    print('\n\n\n')
```

```

print('Enter the numbers separated by space: ')
nums = list(map( int , input().split(' ') ))
print(f'Average of the numbers {nums} is {sum(nums)/len(nums)}')
node_home()

def node_2() -> None:
    print('\n\n\n')
    print('Enter 5 numbers separated by space: ')
    nums = list(map( int , input().split(' ') ))
    print('The square of the given numbers is as follows: ')
    for num in nums:
        print(f'{num}^2 = {num**2}')
    node_home()

def node_home() -> None:
    print('\n\n\n' + '-'*100 + '\n\n\n')
    print('What would you like to do?')
    print('1) Display average of all numbers entered by the user')
    print('2) Display the squares of 5 numbers entered by the user')
    print('3) Exit')

    chc = int(input('Enter your choice: '))
    if chc == 1:    node_1()
    elif chc == 2:  node_2()

node_home()

```

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What would you like to do?

- 1) Display average of all numbers entered by the user
- 2) Display the squares of 5 numbers entered by the user
- 3) Exit

Enter your choice: 1

Enter the numbers separated by space:

3 4 5 1

Average of the numbers [3, 4, 5, 1] is 3.25

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What would you like to do?

- 1) Display average of all numbers entered by the user
- 2) Display the squares of 5 numbers entered by the user
- 3) Exit

Enter your choice: 2

Enter 5 numbers separated by space:

1 2 3 4 5

The square of the given numbers is as follows:

$1^2 = 1$

$2^2 = 4$

$3^2 = 9$

$4^2 = 16$

$5^2 = 25$

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What would you like to do?

- 1) Display average of all numbers entered by the user
- 2) Display the squares of 5 numbers entered by the user
- 3) Exit

Enter your choice: 3

**Q3) WAP to print factorial of n (to be input by user)**

```
[3]: n = int(input('Enter a number: '))

ans = 1
for i in range(1,n+1): ans *= i

print(f'Factorial of {n} is {ans}')
```

Enter a number: 5

Factorial of 5 is 120

**Q4) WAP to input n and print the square of numbers upto n**

```
[4]: # WAP to input n and print the square of numbers upto n
n = int(input('Enter a number: '))

for i in range(1,n+1):
    print(f'{i}^2 = {i**2}')
```

Enter a number: 10

1<sup>2</sup> = 1  
2<sup>2</sup> = 4  
3<sup>2</sup> = 9  
4<sup>2</sup> = 16  
5<sup>2</sup> = 25  
6<sup>2</sup> = 36  
7<sup>2</sup> = 49  
8<sup>2</sup> = 64  
9<sup>2</sup> = 81  
10<sup>2</sup> = 100

**Q5) WAP to print sum of first n natural numbers**

```
[5]: n = int(input('Enter a number: '))

nums = [i for i in range(1,n+1)]

print(f'Sum of the first {n} natural numbers is {sum(nums)}')
```

Enter a number: 10

Sum of the first 10 natural numbers is 55

**Q6) WAP to print the sum of even numbers from 1 to n**

```
[6]: n = int(input('Enter a number: '))

nums = [i for i in range(1,n+1) if i%2==0]

print(f'Sum of all even numbers from 1 to {n} is {sum(nums)}')
```

Enter a number: 10

Sum of all even numbers from 1 to 10 is 30

**Q7) WAP to sum of first 15 natural numbers and print the result of addition of every new number**

```
[7]: n = 15
nums = [i for i in range(1,n+1)]

for i in range(1, n):
    lis = nums[0:i+1]
    lis_str = map(str,lis)
    print(f'{" + ".join(lis_str)} = {sum(lis)}')
```

1 + 2 = 3

1 + 2 + 3 = 6

1 + 2 + 3 + 4 = 10

1 + 2 + 3 + 4 + 5 = 15

1 + 2 + 3 + 4 + 5 + 6 = 21

1 + 2 + 3 + 4 + 5 + 6 + 7 = 28

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 36

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = 45

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 = 66

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 = 78

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 = 91

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 = 105

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15 = 120

**Q8) WAP to print factorial of first 6 natural numbers**

```
[8]: def fact(x) -> int:
    if x == 1: return 1
    else:      return x * fact(x-1)

n = 6

for i in range(1, n+1):
    print(f'{i}! = {fact(i)}')
```

1! = 1

2! = 2

3! = 6

4! = 24

5! = 120

6! = 720