Python Basics

1. Integer/Float

In [1]:

```
a = 100.199
print(f"The data type of a is '{type(a)}' and the value is '{a}'")
a = int(a)
print(f"after type casting data type of a is '{type(a)}' and the value is '{a}'")
a = str(a)
print(f"Now data type of a is '{type(a)}' and the value is '{a}'")
```

```
The data type of a is '<class 'float'>' and the value is '100.199'
after type casting data type of a is '<class 'int'>' and the value is '100'
Now data type of a is '<class 'str'>' and the value is '100'
```

2. List

Lists are used to store multiple items in a single variable.

In [2]:

```
# List can contain multiple data types
a = [1,1,2,3,4,'abc', 1.43]
print(a)

# Adding and deleting data from list

a.append(123)
print(a)
a.remove(1)
print(a)
# List Slicing
# list[start:end:steps]
a[:6:2]

# For loop in list
for i in a:
    print(a)
```

```
[1, 1, 2, 3, 4, 'abc', 1.43]
[1, 1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
[1, 2, 3, 4, 'abc', 1.43, 123]
```

3. Dictionaries

Dictionaries are used to store data values in key:value pairs.

In [3]:

```
d = {
    "40110122": {
            "name": "Aryan Amish",
            "roll": "20S115893",
            "branch": "CSE",
            "batch": "2020-2024",
    },
        "40110123": {
            "name": "xyz",
            "roll": "13314212",
            "branch": "CSE",
            "batch": "2020-2024",
    }
}

# Acessing a Value in Dict
d["40110122"]["name"]

# For Loop in dict
for i, j in d.items():
    print(f"Key: {i}, \n\tValue: {j}")
```

```
Key: 40110122,
        Value: {'name': 'Aryan Amish', 'roll': '20S115893', 'branch': 'CSE',
'batch': '2020-2024'}
Key: 40110123,
        Value: {'name': 'xyz', 'roll': '13314212', 'branch': 'CSE', 'batch':
'2020-2024'}
```

4. Sets

Sets are used to store multiple items in a single variable. It has O(1) search time complexity

In [4]:

```
s = {1,2,3,4,"hi there", 12.4}
print(s)
# adding items in sets
s.add("hello")
# removing item in sets
s.remove("hi there")
print(s)

# Search Items in sets
print(1 in s)
print('hello' in s)
print(12341 in s)
```

```
{1, 2, 3, 4, 12.4, 'hi there'}
{1, 2, 3, 4, 12.4, 'hello'}
True
True
False
```

5. Bool

bool is a data type which stores only True and False value

In [5]:

```
b = False
print(b)
```

```
False
```

6. Tuple

Tuple is just like list but you cannot change the value of tupe once it is defined

In [6]:

```
t = (1,2,34)
print(t)
```

```
(1, 2, 34)
```

7. For Loop

For Loop is used for Looping over some data type or looping over a interval

In [7]:

```
# this will print the number from 0-9
for i in range(10):
    print(i)

# this will print the items of the list
for i in [1,2,3,4,5]:
    print(i)
print()
# this will print each character of the string
for i in "hi there":
    print(i)
```

```
0
1
2
3
4
5
6
7
8
9
1
2
3
4
5

h
i
 
t
h
e
r
e
```

8. While Loop

With the while loop we can execute a set of statements as long as a condition is true.

In [8]:

```
# this loop will print from 0 to 10
a = 0
while a<=10:
    print(a)
    a += 1
```

```
0
1
2
3
4
5
6
7
8
9
10
```

9. Input from User

In [9]:

```
l = list(map(int, input().split()))
print(l)
```

```
1 2 3 4 5 6
[1, 2, 3, 4, 5, 6]
```

Q. Check if a number is Prime or not

In [10]:

```
def prime_number(n=None):
    n = int(input("Enter a Number to check if it is Prime: ")) if n is None else n
    is_prime = True
    for i in range(2, n//2):
        if n%i == 0:
            is_prime = False
            break
    print(f"{n} is Prime" if is_prime is True else f"{n} is not Prime")

prime_number()
prime_number()
```

```
Enter a Number to check if it is Prime: 54
54 is not Prime
Enter a Number to check if it is Prime: 23
23 is Prime
```

Q. Find the Factorial of a number

In [11]:

```
def factorial(n=None):
    n = int(input("Enter a number to find the Factorial : ")) if n is None else n
    ans = 1
    for i in range(2, n+1):
        ans *= i
    print(ans)
factorial()
factorial()
```

```
Enter a number to find the Factorial : 5
120
Enter a number to find the Factorial : 8
40320
```

Q. sum of first and last digits of the number

In [12]:

```
def sum_first_last_digit():
    n = input("Enter a number: ")
    print(int(n[0])+int(n[-1]))
sum_first_last_digit()
sum_first_last_digit()
```

```
Enter a number: 124
5
Enter a number: 654
10
```

Q. Palindrome

In [13]:

```
def palindrome(orignal=None):
    orignal = list(input("Enter any thing: ")) if orignal is None else orignal
    reverse = orignal.copy()
    reverse.reverse()
    if orignal == reverse:
        print("It is a Plindrome")
    else:
        print("It is not a Plindrome")
palindrome()
palindrome()
```

```
Enter any thing: racecar
It is a Plindrome
Enter any thing: hello
It is not a Plindrome
```

Q. Count the numbers of digit in a number

In [14]:

```
def no_of_digits():
    n = input("Enter any number: ")
    print(len(n))
no_of_digits()
no_of_digits()
```

```
Enter any number: 324135
6
Enter any number: 1435133513
10
```

In [15]:

```
def armstrong(n=None):
    num = int(input("Enter a Number: ")) if n is None else n
    sums = 0

    temp = num
    while temp > 0:
       digit = temp % 10
       sums += digit ** 3
       temp //= 10

    if num == sums:
       print(num,"is an Armstrong number")
    else:
       print(num,"is not an Armstrong number")
armstrong()
armstrong()
```

```
Enter a Number: 153
153 is an Armstrong number
Enter a Number: 442
442 is not an Armstrong number
```

Q. nCr nPr

In [16]:

```
def npr():
    n, r = list(map(int, input("Enter a Number to calculate ncr: ").split()))
    print(n,r)
    print(factorial(n)/factorial(n-r))
```

In [17]:

```
import numpy as np
```

In [34]:

```
a = np.array([6,7,8])
b = np.array([1,2,3])
c = np.array([4,5,6])
abc = np.array([a,b,c])
print(abc)
```

```
[[6 7 8]
 [1 2 3]
 [4 5 6]]
```

In [35]:

```
print("Shape: ",abc.shape)
print("Size is: ", abc.size)
```

```
Shape:  (3, 3)
Size is:  9
```