



Python-Loops, Functions

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Agenda

- Decision making
- Loops-while, for
- Strings
- Functions – arguments
- Call by reference/value

*One guiding principle of Python code is that
“explicit is better than implicit”*

Artificial Intelligence

Machine Learning

Deep Learning

*"Success is more a
function of consistent
common sense than it is
of genius"*

(An Wang, Computer engineer and
inventor, 1920 - 1990)



Decision making

```
x = int( input('enter marks'))  
if (x>50) : print('pass')  
else : print('fail')
```

Or

```
x = int( input('enter marks'))  
if (x>50) :  
    print('pass')  
else :  
    print('fail')
```

```
if expression1:  
    statement(s)  
    if expression2:  
        statement(s)  
    elif expression3:  
        statement(s)  
    elif expression4:  
        statement(s)  
    else:  
        statement(s)  
else:  
    statement(s)
```



Exercise

1. Write command to check whether input number is even or odd.
2. Write a command/program to accept marks from user and print the division.
3. Write command/s to return sum of digits of given number.



loops

while expression :
 statements()

```
i=0
while (i<5) :
    print (i, 'Jai Ho')
    i=i+1
```

```
0 Jai Ho
1 Jai Ho
2 Jai Ho
3 Jai Ho
4 Jai Ho
```

while expression :
 statements()
else :
 statements()

```
i=0
while (i<5) :
    print (i, 'Jai Ho')
    i=i+1
else :
    print (i, ' Its over now')
```

```
0 Jai Ho
1 Jai Ho
2 Jai Ho
3 Jai Ho
4 Jai Ho
5  Its over now
```



for loop

for iterating Variable in sequence
statement/s

```
In [3]: states=['J&K', 'HimachalPradesh', 'Punjab', 'Delhi']  
for st in states:  
    print (st)
```

```
J&K  
HimachalPradesh  
Punjab  
Delhi
```

```
In [4]: for st in range(len(states)):  
        print (states[st])
```

```
J&K  
HimachalPradesh  
Punjab  
Delhi
```

```
In [5]: for alpha in 'India':  
        print(alpha)
```

```
I  
n  
d  
i  
a
```

for iterating Variable in sequence
statement/s

else:

statement/s

```
In [7]: for st in range(len(states)):  
        print (states[st])  
else :  
        print('-----Its over ----- ')
```

```
J&K  
HimachalPradesh  
Punjab  
Delhi  
-----Its over -----
```



For loop: Example

```
1. for n in range(21, 0, -3):  
    print(n, ", end=")
```

Output: 21 18 15 12 9 6 3

```
2. for n in range(1000) :  
    print(n, end=' ')
```

Output: 0, 1, 2, . . . , 999.

```
3.     sum = 0  
    for i in range(1, 100):  
        sum += i  
    print(sum)
```

Output: adds nos from 1 to 99



Iteration : for

`range(10) → 0, 1, 2, 3, 4, 5, 6, 7, 8, 9`

`range(1, 10) → 1, 2, 3, 4, 5, 6, 7, 8, 9`

`range(1, 10, 2) → 1, 3, 5, 7, 9`

`range(10, 0, -1) → 10, 9, 8, 7, 6, 5, 4, 3, 2, 1`

`range(10, 0, -2) → 10, 8, 6, 4, 2`

`range(2, 11, 2) → 2, 4, 6, 8, 10`

`range(-5, 5) → -5, -4, -3, -2, -1, 0, 1, 2, 3, 4`

`range(1, 2) → 1`

`range(1, 1) → (empty)`

`range(1, -1) → (empty)`

`range(1, -1, -1) → 1, 0`

`range(0) → (empty)`



Exercise

1. Write program to check whether given number is prime or not
2. Write a program to find those numbers which are divisible by 7 and multiple of 5, between 1500 and 2700 (both included).
3. Write a Python program to get the Fibonacci series between 0 to 50.
4. Write a program to construct the pattern, using a nested for loop.

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
      *
     * *
    * * *
   * * * *
  * * * * *
 * * * * *
* * * * *
```

```
1
22
333
4444
55555
666666
7777777
88888888
999999999
```



Exercise

1. Write a program to print the table of given number entered by the user
2. Write a program which can compute the factorial of a given numbers.

$$5 * 1 = 5$$

$$5 * 2 = 10$$

$$5 * 3 = 15$$

$$5 * 4 = 20$$

$$5 * 5 = 25$$

$$5 * 6 = 30$$

$$5 * 7 = 35$$

$$5 * 8 = 40$$

$$5 * 9 = 45$$

$$5 * 10 = 50$$

Loop Control Statements

Break : Terminates loop statement

```
for alpha in 'Greatness':  
    if alpha == 'n':  
        break  
    print ('letter ', alpha)
```

```
letter G  
letter r  
letter e  
letter a  
letter t
```

continue : returns the control to the beginning of the while/for loop

```
for alpha in 'Greatness':  
    if alpha == 'n':  
        continue  
    print ('letter ', alpha)
```

```
letter G  
letter r  
letter e  
letter a  
letter t  
letter e  
letter s  
letter s
```

pass : is used when a statement is required syntactically but you do not want any command or code to execute

```
for alpha in 'Greatness':  
    if alpha == 'n':  
        pass  
    print ('Pass block')  
    print ('letter ', alpha)
```

```
letter G  
letter r  
letter e  
letter a  
letter t  
Pass block  
letter n  
letter e  
letter s  
letter s
```



String

- Strings Are Immutable : once created cannot be changed.

```
: #string concatenation
print (str + ' ' + str1)
#string slicing
print('str ',str)
print('str[1:3]',str[2:8] )
print('str[11:]',str[11:] )
print('str[:11]',str[:11] )
print('str[:-2]',str[:-2] )
print('str[-2]',str[-2] ) #second last str[len(str) -2]
```

```
Incredible India Great
str Incredible India
str[1:3] credib
str[11:] India
str[:11] Incredible
str[:-2] Incredible Ind
str[-2] i
```

```
print('str1 * 3 ',str1 * 3)
print('str1 * 3 ',str1 * 3)
print('str1 * 3 ',str1 * 3)
```

```
str1 * 3 GreatGreatGreat
```

```
#string length and index
for s in range(len(str1)):
    print(str1[s])
```

```
G
r
e
a
t
```

```
'e' in str1
```

```
True
```

```
for x in str1:
    print (x)
```

```
G
r
e
a
t
```



String methods

```
str.upper()
```

```
'INCREDIBLE INDIA'
```

```
str.capitalize()
```

```
'Incredible india'
```

```
#string.center(width[, fillchar])  
print(str.center(40))  
print(str.center(40, '-'))
```

```
                Incredible India  
-----Incredible India-----
```

```
#str.count(sub, start= 0,end=len(string))  
print(str.count('In'))
```

```
2
```

```
#str.find(str, beg=0, end=len(string))  
print(str.find('nd'))
```

```
12
```

```
str.join('*-*-*')
```

```
'-Incredible India*Incredible India-Incredible India*'
```

```
str.swapcase()
```

```
'iNCREDIBLE iNDIA'
```

```
str.title()
```

```
'Incredible India'
```

```
str.lower()
```

```
'incredible india'
```

```
about=''' This is multiline  
string and it can span across  
multiple lines'''
```

```
about
```

```
' This is multiline\nstring and it can span across\nmultiple lines'
```