- Basic syntax
- conditional statements
- try-exception
- functions
- loop
    - for
    - while

$For\ loop$

- you will be in the loop
- when you will enter into the loop
- how much time you will stay in the loop
- how you will come out of the from the loop

- intialization
- increment/ decrement
- condition to stop the loop

In [ ]:
```
# I want to print fisrt 10 numbers
# intial point: 0
# increment
# cond=10
```

In [ ]:
```
i=0
i=1
i=2
i=3
i=4
```

$pattern - 1$

for i in range(stop):

- in the bracket if we have only single value that is consider as stop value
- the default start value is =0
- python index always start with :0
- if direction sign is not mentioned : increment (+) sign
- if direction is postive side then end=stop-1

In [4]:
```
for i in range(20):
    print(i)

# start=0
# direc=+
# end=stop-1=20-1=19
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
```

In [ ]:
```
for i in range(20):
    print(i)
```

In [5]:
```
print(0)
print(1)
print(2)

# generalised: print(i)
```

```
0
1
2
```

In [ ]:
```
- intial

- increment/decrement

- condition

for i in range(20)
```

In [ ]:

In [8]:
```
print(0,end=' ')
print(1,end=' ')
print(2)   # 0 1 2

#print(i,end=' ')
```

```
0 1 2
```

In [9]:
```
for i in range(20):
    print(i,end=' ')
```

```
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
```

$pattern-2$

for i in range(start,stop)

- start: start of the loop, intial point
- direction sign not mentioned: +ve direction i.e.increment
- end=stop-1

In [11]:
```
for i in range(2,7):
    print(i,end=' ')
# start=10  pos  end=20-1=19
```

```
2 3 4 5 6
```

$pattern-3$

for i in range(start,stop,step)

- start: start of the loop, intial point
- direction: what is sign of step value, that is the direction

```
- direction will not decide by start and stop value

- direction will provided by step value
```

- if step size is postive direction

```
  end= stop-1
```

- if step size is negative direction

```
 end=stop+1
```

In [12]:
```
for i in range(2,20,2):  # (start,stop,step)
    print(i,end=' ')

# start=2
# direction: step size=+2
# end=stop-1=20-1=19

# 2  4  6  8  10  12  14  16  18  <20>
```

```
2 4 6 8 10 12 14 16 18
```

In [13]:
```
for i in range(-1,-10,-1):
    print(i,end=' ')

# start= -1
# direction: step=-1    negative
# end= stop+1 = -10+1=-9
# is this possible or not?
```

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

In [14]:
```
for i in range(-1,-10,1):
    print(i,end=' ')

# start=-1
# direc= step=+1
# end=stop-1= -10-1=-11
# possible/np
```

In [15]:
```
for i in range(8,20,-2):
    print(i)

# start=8
# direc=step=-2  : -neg
# end=stop+1=20+1=21
```

In [ ]:
```
range(3,25,3)   # start=3  pos  end =25-1=24 p
range(3,25,-3)  # 3        neg  end=25+1=26 np
range(3,-25,3)  # np
range(3,-25,-3) # start=3   neg   end= -25+1=-24
range(-3,25,3)  # p
range(-3,-25,3) # np
range(-3,25,-3) # np
range(-3,-25,-3) # p
```

In [16]:
```
for i in range(3,-25,-3): print(i,end=' ')
```

```
3 0 -3 -6 -9 -12 -15 -18 -21 -24
```

In [1]:
```
#Wap print : hello  3 times/iteration ===== > loop for
print('hello')
print('hello')
print('hello')
print('hello') # generalised
```

```
hello
hello
hello
```

In [6]:
```
# first set up the loop
for i in range(3):
    print('hello')
```

```
hello
hello
hello
```

In [7]:
```
print('hai')
for i in range(3):
    print('hello')
print('how do yo do')
```

```
hai
hello
hello
hello
how do yo do
```

In [8]:
```
# A
# A
# A
# B
# B
# C
# C
# C

for i in range(3):
    print("A")
for i in range(2):
    print("B")
for i in range(3):
    print("C")
```

```
A
A
A
B
B
C
C
C
```

In [9]:
```
# A
# B
# A
# B
# A
# B
# C
# C
# C

for i in range(3):
    print("A")
    print('B')
for i in range(3):
    print("C")
```

```
A
B
A
B
A
B
C
C
C
```

In [11]:
```
# WAP ask the user to get the square of the numbers
# between 10 to 15
# square of 10 is 100
# square of 11 is 121
# square of 12 is 144

# first get the numbers from 10 to 15
for i in range(10,16):
    print("The square of {} is {}".format(i,i*i))
```

```
The square of 10 is 100
The square of 11 is 121
The square of 12 is 144
The square of 13 is 169
The square of 14 is 196
The square of 15 is 225
```

In [12]:
```
# the same above question
# take the numbers from keyboard
# num1=eval(input())   10
# num2=eval(input())   16
# replace 10,16 in for loop with variables num1,num2
num1=eval(input('enter start number:'))
num2=eval(input('enter stop number:'))

for i in range(num1,num2):
    print("The square of {} is {}".format(i,i*i))
```

```
enter start number:10
enter stop number:16
The square of 10 is 100
The square of 11 is 121
The square of 12 is 144
The square of 13 is 169
The square of 14 is 196
The square of 15 is 225
```

In [13]:
```
#num1=eval(input('enter start number:'))
#num2=eval(input('enter stop number:'))

for i in range(eval(input('enter start number:')),
               eval(input('enter stop number:'))):
    print("The square of {} is {}".format(i,i*i))
```

```
enter start number:10
enter stop number:16
The square of 10 is 100
The square of 11 is 121
The square of 12 is 144
The square of 13 is 169
The square of 14 is 196
The square of 15 is 225
```

In [14]:
```
num1=10
num2=16

for i in range(num1,num2):
    print("The square of {} is {}".format(i,i*i))
```

```
The square of 10 is 100
The square of 11 is 121
The square of 12 is 144
The square of 13 is 169
The square of 14 is 196
The square of 15 is 225
```

In [16]:
```
# Function with out arguments
def square1():

    num1=eval(input('enter start number:'))
    num2=eval(input('enter stop number:'))

    for i in range(num1,num2):
        print("The square of {} is {}".format(i,i*i))

square1()
```

```
enter start number:10
enter stop number:13
The square of 10 is 100
The square of 11 is 121
The square of 12 is 144
```

In [25]:
```
name='usha'
print('my name is',name)
print('my name is {}'.format(name))
print("the square of {} is {}".format(5,5*5))
```

```
my name is usha
my name is usha
the square of 5 is 25
```

In [27]:
```
# Function with arguments
def square1(num11,num22):

    for i in range(num11,num22):
        print("The square of {} is {}".format(i,i*i))

square1(10,13)
```

```
The square of 10 is 100
The square of 11 is 121
The square of 12 is 144
```

In [29]:
```
# Wap ask the user to print square of the five numbers
# and these five numbers you need ask user every time
for i in range(5):
    num=eval(input('enter a number:'))
    print("the square of {} is {}".format(num,num*num))
```

```
enter a number:10
the square of 10 is 100
enter a number:20
the square of 20 is 400
enter a number:30
the square of 30 is 900
enter a number:40
the square of 40 is 1600
enter a number:50
the square of 50 is 2500
```

In [30]:
```
for i in range(5):
    print("the square of {} is {}".format(i,i*i))
```

```
the square of 0 is 0
the square of 1 is 1
the square of 2 is 4
the square of 3 is 9
the square of 4 is 16
```

In [31]:
```
num=eval(input('enter a number:'))# 5
for i in range(5):
    print("the square of {} is {}".format(num,num*num)) # 25 25 25 25 25


for i in range(5):
    num=eval(input('enter a number:')) # 5 6
    print("the square of {} is {}".format(num,num*num)) # 25 36
```

```
enter a number:5
the square of 5 is 25
the square of 5 is 25
the square of 5 is 25
the square of 5 is 25
the square of 5 is 25
enter a number:5
the square of 5 is 25
enter a number:6
the square of 6 is 36
enter a number:7
the square of 7 is 49
enter a number:8
the square of 8 is 64
enter a number:9
the square of 9 is 81
```

In [33]:
```
# Wap ask the user to print square of the five numbers
# and these five numbers you need ask user every time
#for i in range(5):
    #num=eval(input('enter a number:'))
    #print("the square of {} is {}".format(num,num*num))


# WAP ask the user to print five times square of a number
# this time you need to take every time a random number between 1 to 20
import random
for i in range(5):
    num=random.randint(1,20)
    print("the square of {} is {}".format(num,num*num))
```

```
the square of 12 is 144
the square of 3 is 9
the square of 6 is 36
the square of 18 is 324
the square of 9 is 81
```

In [38]:
```
# WAP ask the user print the given number is even or odd
# you need to take the number between 10 30

# iterate the loop between 10 and 30
# every time apply if i%2==0: print even
#                  else : print odd

for num in range(10,31):
    if num%2==0:
        print("the given {} is even".format(num))
    else:
        print("the given {} is odd".format(num))
```

```
the given 10 is even
the given 11 is odd
the given 12 is even
the given 13 is odd
the given 14 is even
the given 15 is odd
the given 16 is even
the given 17 is odd
the given 18 is even
the given 19 is odd
the given 20 is even
the given 21 is odd
the given 22 is even
the given 23 is odd
the given 24 is even
the given 25 is odd
the given 26 is even
the given 27 is odd
the given 28 is even
the given 29 is odd
the given 30 is even
```

In [40]:
```
# WAP ask the user print the given number is even or odd
# you need to take the number between randomly between 10 and 30
# this process you need to 5 times

# create a for loop to run 5 times
# every time get the random number
# finally apply if-else condition : it is an even and odd

import random
for i in range(5):
    num=random.randint(10,30)
    if num%2==0:
        print("the given {} is even".format(num))
    else:
        print("the given {} is odd".format(num))
```

```
the given 13 is odd
the given 12 is even
the given 28 is even
the given 26 is even
the given 24 is even
```

In [41]:
```
def even_odd(num):
    if num%2==0:
        print("the given {} is even".format(num))
    else:
        print("the given {} is odd".format(num))

import random
for i in range(5):
    num=random.randint(10,30)
    even_odd(num)
```

```
the given 30 is even
the given 14 is even
the given 23 is odd
the given 15 is odd
the given 20 is even
```

In [52]:
```
# 5 lines
# take a random number from random package between 1 to 10

# ========= you need to repat 3 times============
# ask the user enter a number between 1 to 10
# if the number == random number:
#        print('you won')
# else:
#     print('you lost')

import random
random_num=random.randint(1,10)
print(random_num)
for i in range(3):
    user_num=eval(input("enter number between 1 and 10:"))
    if user_num==random_num:
        print("you won")
        break
    else:
        print("you lost")
```

```
4
enter number between 1 and 10:5
you lost
the number of chances left is: 2
enter number between 1 and 10:4
you won
```

In [ ]:

```
# 5 lines
# take a random number from random package between 1 to 10

# ========= you need to repat 3 times============
# ask the user enter a number between 1 to 10
# if the number == random number:
#        print('you won')
# else:
#     print('you lost')

import random
random_num=random.randint(1,10)
print(random_num)
for i in range(3):
    user_num=eval(input("enter number between 1 and 10:"))
    if user_num==random_num:
        print("you won")
        break
    else:
        print("you lost")
        print("the number of chances left is:",3-1-i)
```

In [55]:
```python
# Improvise above code
# you need to mention number of chances left
# the user whenever he fail/losr


import random
random_num=random.randint(1,10)
print(random_num)
chances=eval(input("enter how many chances you want:"))
for i in range(chances):
    user_num=eval(input("enter number between 1 and 10:"))
    if user_num==random_num:
        print("you won")
        break
    else:
        print("you lost")
        print("the number of chances left is:",chances-1-i)
```

```
8
enter how many chances you want:7
enter number between 1 and 10:9
you lost
the number of chances left is: 6
enter number between 1 and 10:3
you lost
the number of chances left is: 5
enter number between 1 and 10:6
you lost
the number of chances left is: 4
enter number between 1 and 10:6
you lost
the number of chances left is: 3
enter number between 1 and 10:6
you lost
the number of chances left is: 2
enter number between 1 and 10:6
you lost
the number of chances left is: 1
enter number between 1 and 10:6
you lost
the number of chances left is: 0
```

In [58]:
```
# Improvise above code
# whenever the user lost all the chances
# it should print all the chances are over
# print('pls try again after 10mins')

# Hint:
# you need to provide one more condtion

import random
random_num=random.randint(1,10)
print(random_num)
chances=eval(input("enter how many chances you want:"))
for i in range(chances):
    user_num=eval(input("enter number between 1 and 10:"))
    if user_num==random_num:
        print("you won")
        break

    elif chances-1-i==0:
        print("you lost")
        print("all chances are over")
        print("pls try again")
    else:
        print("you lost")
        print("the number of chances left is:",chances-1-i)
        print("----------------------------------------")

# Chances=3
# i=0    2    10   if 2==10 F ====> elif 3-1-0: 2==0 F ====> else: 2
# i=1    2    10   if 2==10 F ====> elif 3-1-1: 1==0 F ====> else:1
# i=2   2     10   if 2==10 F =====> elif 3-1-2:0==0 T
```

```
4
enter how many chances you want:3
enter number between 1 and 10:2
you lost
the number of chances left is: 2
----------------------------------------
enter number between 1 and 10:2
you lost
the number of chances left is: 1
----------------------------------------
enter number between 1 and 10:2
you lost
all chances are over
pls try again
```

In [5]:
```
# WAP ask the user get the sum of 10 natural nunbers
# 1+2+3+4+5+6+7+8+10=55

summ=0
for i in range(1,11):
    print("{}+{} is:".format(summ,i))
    summ=summ+i    # 1+2=1
    print(summ)    # in this loop the last value is 55

print("The sum of first 10 natural numbers is:",summ)

#0+1=1
#1+2=3
#3+3=6
#6+4=10
#10+5=15
#15+6=21
#(21)+(7)=28
#(sum)+(i)
```

```
0+1 is:
1
1+2 is:
3
3+3 is:
6
6+4 is:
10
10+5 is:
15
15+6 is:
21
21+7 is:
28
28+8 is:
36
36+9 is:
45
45+10 is:
55
The sum of first 10 natural numbers is: 55
```

In [6]:
```
for i in range(10):
    num=i
    print(i)  # 9

num
```

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

Out[6]: 9

- whenever if you want implement counter program
- summ program
- intialize the variable with zero
- like: summ=0 or count=0
- inside the loop based on the problem update the variable
- like: summ=summ+i or count=count+i

- `    : summ+=i      or  count+=i`

In [10]:
```
# WAP ask the user print the given number is even or odd
# you need to take the number between randomly between 10 and 30
# this process you need to 5 times

# create a for loop to run 5 times
# every time get the random number
# finally apply if-else condition : it is an even and odd

# Improvise this problem
# by count the number of even and number odds you are getting
even_count=0
odd_count=0
import random
for i in range(5):
    num=random.randint(10,30)
    if num%2==0:
        print('when is even:',i)
        print("the given {} is even".format(num))
        even_count=even_count+1
    else:
        print('when is odd:',i)
        print("the given {} is odd".format(num))
        odd_count=odd_count+1

print(even_count,odd_count)

# i=0  =1  =4
# even_count=0
# even_count=even_count+i  ==== > 0+0=0
# 0+1=1
# 1+4=5
```

```
when is odd: 0
the given 27 is odd
when is odd: 1
the given 25 is odd
when is odd: 2
the given 27 is odd
when is odd: 3
the given 11 is odd
when is odd: 4
the given 29 is odd
0 5
```

In [ ]:
```
ypur loop should run 3 time
even=0
i=0      24     one even
i=1      22     two
i=3      19
```

In [16]:
```
# WAP ask the user take a random number between 1 to 99
# iterate the loop 10 times
# count how many times a number is coming and greater than 50

import random
count=0
for i in range(10):
    num=random.randint(1,99)
    if num>50:
        print(num)
        count+=1

print("the number of values more than 50 is:",count)
```

```
90
95
62
60
the number of values more than 50 is: 4
```

In [24]:
```
# Number of divisiors program
# 10 is divisible by what numbers
# 10/1  10/2  10/3 10/4 10/5 10/6 10/7 10/8 10/9 10/10
# (num/i)%2==0
# 5 divisiors :   1 to 5

d_count=0
nd_count=0
num=eval(input("enter which number divsiors want to know:"))
for i in range(1,num+1):
    if num%i==0:
        print("{} is divisible by {}".format(num,i))
        d_count=d_count+1

    else:
        nd_count=nd_count+1


print("The number of divisors are:",d_count)
print("the number of non divisors count is:",nd_count)
```

```
enter which number divsiors want to know:10
10 is divisible by 1
10 is divisible by 2
10 is divisible by 5
10 is divisible by 10
The number of divisors are: 4
the number of non divisors count is: 6
```

In [29]:
```
num=eval(input("enter which number divsiors want to know:"))

def counter():
    d_count=0
    nd_count=0
    for i in range(1,num+1):
        if num%i==0:
            print("{} is divisible by {}".format(num,i))
            d_count=d_count+1

        else:
            nd_count=nd_count+1
    return(d_count,nd_count)

val1,val2=counter()
print(val1,val2)
```

```
enter which number divsiors want to know:10
10 is divisible by 1
10 is divisible by 2
10 is divisible by 5
10 is divisible by 10
4 6
```

In [27]:
```
def counter2():
    d_count=0
    nd_count=0
    num=eval(input("enter which number divsiors want to know:"))
    for i in range(1,num+1):
        if num%i==0:
            print("{} is divisible by {}".format(num,i))
            d_count=d_count+1

        else:
            nd_count=nd_count+1

    return(d_count,nd_count)

val1,val2=counter2()
print(val1,val2)
```

```
enter which number divsiors want to know:10
10 is divisible by 1
10 is divisible by 2
10 is divisible by 5
10 is divisible by 10
4 6
```

- whenever if you want implement counter program
- intialise counter inside the function only

In [ ]:
```
#def counter2():
    #========
    #======
    #return()
```

In [31]:
```
def condition(num,i,d_count,nd_count):
    if num%i==0:
        print("{} is divisible by {}".format(num,i))
        d_count=d_count+1

    else:
        nd_count=nd_count+1

    return(d_count,nd_count)

condition(10,5,0,0)
```

```
10 is divisible by 5
```

Out[31]:
```
(1, 0)
```

In [32]:
```
def counter2():
    d_count=0
    nd_count=0
    num=eval(input("enter which number divsiors want to know:"))
    for i in range(1,num+1):
        d_count,nd_count=condition(num,i,d_count,nd_count)

    return(d_count,nd_count)

val1,val2=counter2()
print(val1,val2)
```

```
enter which number divsiors want to know:10
10 is divisible by 1
10 is divisible by 2
10 is divisible by 5
10 is divisible by 10
4 6
```

In [30]:
```
def condition(num,
              d_count,
              nd_count,
              i):
    if num%i==0:
        print("{} is divisible by {}".format(num,i))
        d_count=d_count+1
    else:
        nd_count=nd_count+1
    return(d_count,nd_count)
```

In [ ]:

```
def condition(num,
              d_count,
              nd_count,
              i):
    if num%i==0:
        print("{} is divisible by {}".format(num,i))
        d_count=d_count+1
    else:
        nd_count=nd_count+1
    return(d_count,nd_count)


def counter2():
    d_count=0
    nd_count=0
    num=eval(input("enter which number divsiors want to know:"))
    for i in range(1,num+1):
        d_count,nd_count=condition(num,d_count,nd_count,i)

    return(d_count,nd_count)

val1,val2=counter2()
print(val1,val2)
```