for loop

for loop is used in python to perform two operations.
1. Repeating one or more than one statement numbers of times
2. Reading values from collections/iterable

Syntax:

for variable in iterable/collection:
        statement-1
        statement-2

for loop repeat statement-1, statement-2 until all values read from collection.
for loop each time read one value from collection and assign to variable and execute statement-1,statement-2.

Example:
str1="PYTHON"
for a in str1:
    print(a)

Output:
P
Y
T
H
O
N

Example:
Write a program to count vowels of input string

str1=input("Enter any string") # java

c=0
for x in str1:
    if x in "aeiouAEIOU":
        c=c+1

```
print(f'Count of Vowels {c}')
```

Output:
Enter any stringjava
Count of Vowels 2

Enter any stringpython
Count of Vowels 1

Example:
```
# Write a program to convert input string into uppercase

str1=input("Enter any string") # Abc1$
str2=""
for ch in str1:
    if ch>='a' and ch<='z':
        str2=str2+chr(ord(ch)-32)
    else:
        str2=str2+ch

print(str1)
print(str2)
```

Output:
Enter any stringpython
python
PYTHON

Enter any stringPyThon
PyThon
PYTHON

range

range is a data type.
range sequence data type. Range is an immutable sequence data type.
Immutable data types does not allows changes (adding, updating or
deleting).

The range type represents an immutable sequence of numbers and is commonly used for looping a specific number of times in for loops.

Syntax1: range(stop)
Syntax2: range(start,stop,[step])

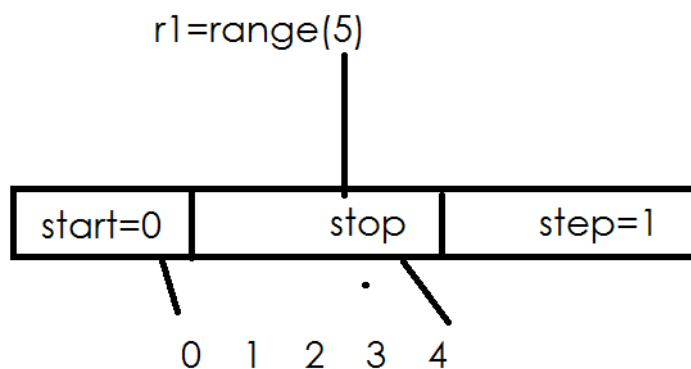**range object is having 3 attributes**
1. Start
2. Stop
3. Step

Range data type is used to generate sequence of numbers (integers) in increment order or decrement order.

1. Start : which represents starting value of range, which is included
2. Stop: which represents stop value of range, which is not included
3. Step: which represent difference between two values in range. It should be +ve or –ve but should not 0

Syntax-1: range(stop)
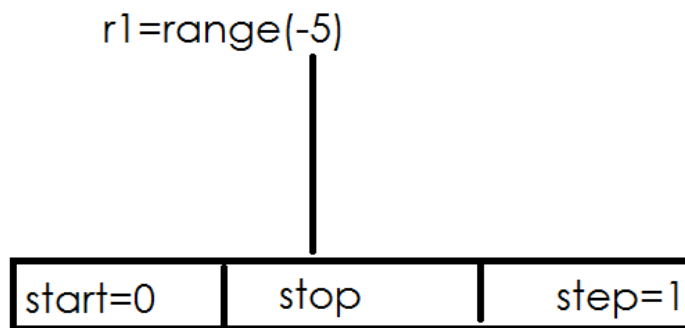This syntax is used to generate sequence of +ve integers in increment order.

r1=range(5)

start=0	stop	step=1

0 1 2 3 4

Example:
r1=range(10) # start=0,stop=10,step=1

for x in r1:
    print("Hello",x)

Output:
Hello 0
Hello 1
Hello 2
Hello 3
Hello 4
Hello 5
Hello 6
Hello 7
Hello 8
Hello 9

r1=range(-5)

start=0	stop	step=1

Example:
r1=range(-5)

for x in r1:
    print(x)

Output:
No output

Start,stop values of range is given based on step value.

Syntax2: range(start,stop,[step])

Default step value +1

If step is +ve, start

If step is –ve,start>stop

range(1,6,1)   1 2 3 4 5

start=1,stop=6,step=1

range(1,6,2)   1 3 5
start=1,stop=6,step=2

range(1,6,3)   1 4

start=1,stop=6,step=3

range(1,6,-1)

start=1,stop=6,step=-1

range(5,0,-1)

start=5,stop=0,step=-1

5 4 3 2 1

range(5,-5,-1)

start=5,stop=-5,step=-1

5 4 3 2 1 0 -1 -2 -3 -4

range(-5,5,1)

start=-5,stop=5,step=1

-5 -4 -3 -2 -1 0 1 2 3 4

Example:
```
for x in range(1,6):
    print(x,end=' ')

print()
for x in range(5,0,-1):
    print(x,end=' ')

print()
for x in range(1,11,2):
    print(x,end=' ')

print()
for x in range(2,11,2):
    print(x,end=' ')

print()
for x in range(5,0,-1):
```

```python
    print(x,end=' ')
print()

for x in range(5,-6,-1):
    print(x,end=' ')

print()
for x in range(10,0,-2):
    print(x,end=' ')
print()

for x in range(-1,-6,-1):
    print(x,end=' ')

print()
for x in range(-1,-6,-2):
    print(x,end=' ')

print()
for x in range(-6,-1):
    print(x,end=' ')

print()
for x in range(-6,6):
    print(x,end=' ')

print()
#for x in range(1.0,10.0):
#    print(x,end=' ')


for x in range(65,91):
    print(chr(x),end=' ')

print()
for x in range(97,123):
    print(chr(x),end=' ')
```

Output:
1 2 3 4 5

5 4 3 2 1
1 3 5 7 9
2 4 6 8 10
5 4 3 2 1
5 4 3 2 1 0 -1 -2 -3 -4 -5
10 8 6 4 2
-1 -2 -3 -4 -5
-1 -3 -5
-6 -5 -4 -3 -2
-6 -5 -4 -3 -2 -1 0 1 2 3 4 5
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z

Homework

1. Write a program to input string and count alphabets, digits and special characters
2. Write a program to input string convert into lowercase
3. Write a program to input string and capitalize string, convert first letter of string into uppercase and remaining in lowercase
4. Write a program to generate even number 2 to 100
5. Write a program to generate odd number 2 to 100
6. Write a program input number and generate table