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Introduction to Loops

by

C02: Fundamentals of Programming

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Loops

Need of Loops ?



Need of Loops ?



1. Khul Jaa Sim Sim!



Need of Loops ?



1. Khul Jaa Sim Sim!

2. Khul Jaa Sim Sim!



Need of Loops ?

1. Khul Jaa Sim Sim!

2. Khul Jaa Sim Sim!

3. Khul Jaa Sim Sim!



Need of Loops ?

1. Khul Jaa Sim Sim!
2. Khul Jaa Sim Sim!
3. Khul Jaa Sim Sim!
4. Khul Jaa Sim Sim!



Need of Loops ?

1. Khul Jaa Sim Sim!
2. Khul Jaa Sim Sim!
3. Khul Jaa Sim Sim!
4. Khul Jaa Sim Sim!
5. Khul Jaa Sim Sim!



Need of Loops ?



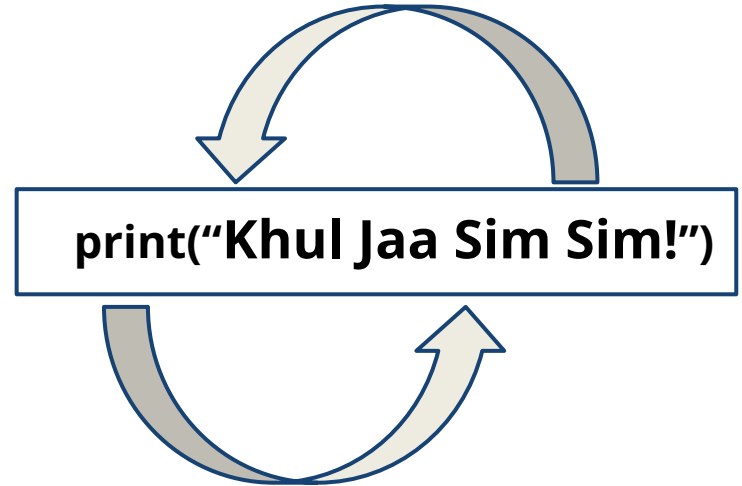
What are Loops ?

A loop is used to repeat an instruction or set of instructions multiple times until a condition goes wrong.

```
print("Khul Jaa Sim Sim!")
print("Khul Jaa Sim Sim!")
print("Khul Jaa Sim Sim!")
print("Khul Jaa Sim Sim!")
print("Khul Jaa Sim Sim!")
```

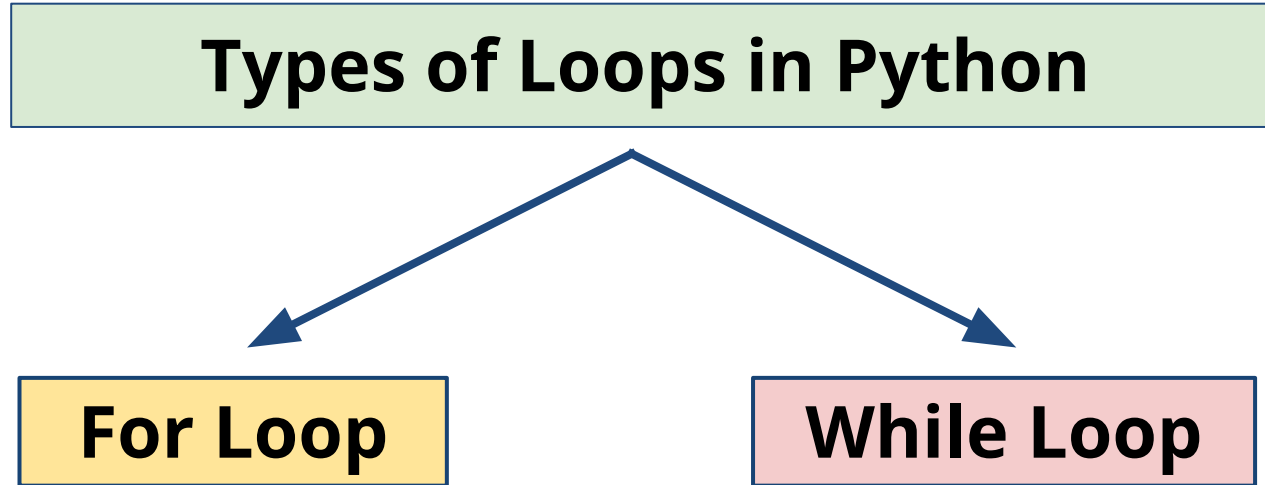
Redundant code

OR



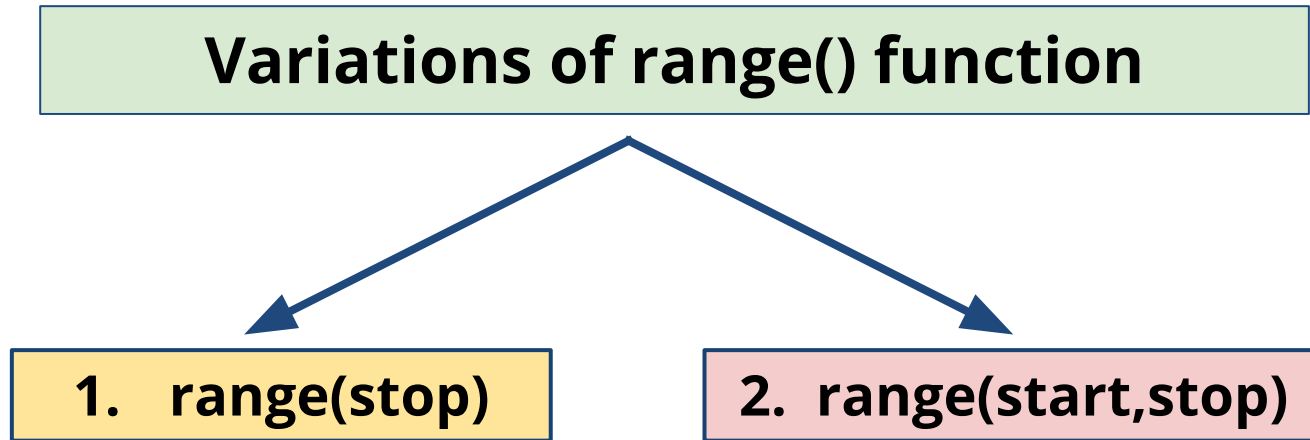
control repetition via loop

Types of Loops :

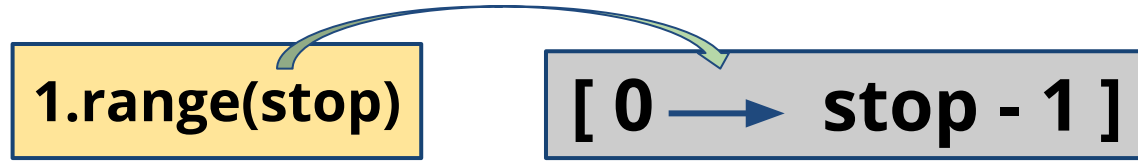


range() Function :

range() is a **built-in Python function** that generates a **sequence of numbers**.



Variations of range() function :



Generates a sequence of numbers starting from 0 up to, but not including, the stop value.

Syntax :-

`range(stop)`

Variations of range() function :

Example :

range(5) will create a list



[0, 1, 2, 3, 4]



Start



Stop - 1

range(9) will create a list



[0, 1, 2, 3, 4, 5, 6, 7, 8]

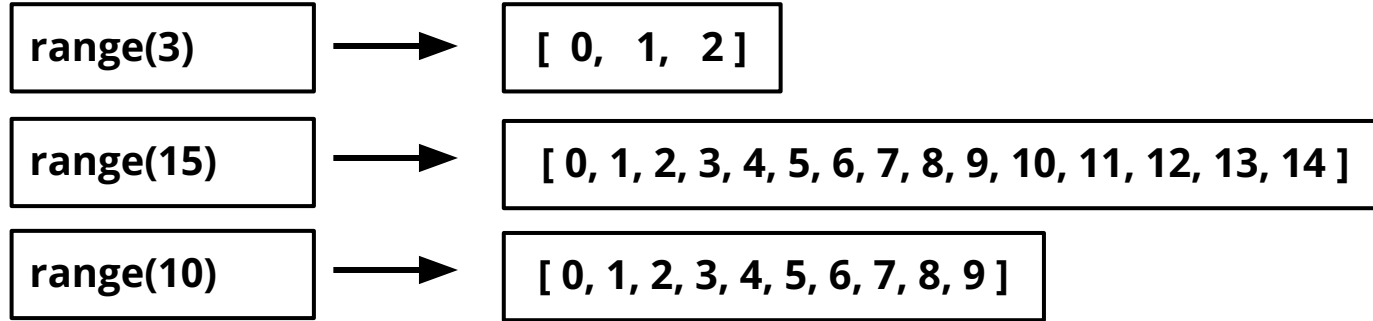


Start



Stop - 1

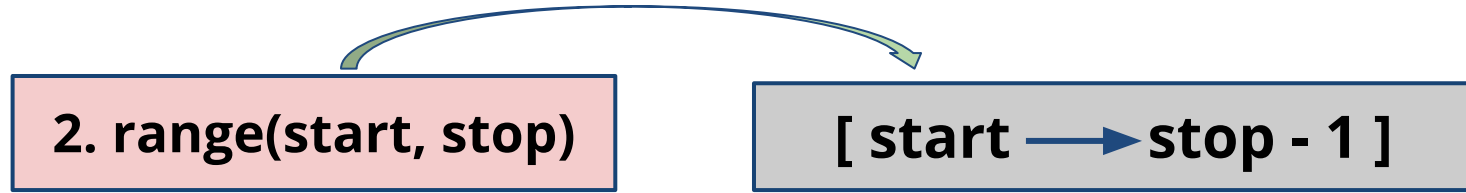
Valid range() Expressions That Generate a positive number Sequence :



Valid range() Expressions That Generate empty Sequence :



Variations of range() function :



Generates a sequence of numbers from start up to, but not including, the stop value.

Syntax :-

range(start, stop)

Variations of range() function :

Example :

range(0,5) will create a list

[0, 1, 2, 3, 4]



Start



Stop - 1

range(3, 12) will create a list

[3, 4, 5, 6, 7, 8, 9, 10, 11]



Start



Stop - 1

Valid range() Expressions that Generate a positive number Sequence

range(0,3)

[0, 1, 2]

range(5,20)

[5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]

range(42,53)

[42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52]

Valid range() Expression that Generate a number Sequence

range(-5,3)

[-5, -4, -3, -2, -1, 0, 1, 2]

Valid range() Expressions that do not Generate a number Sequence

range(3,-5)

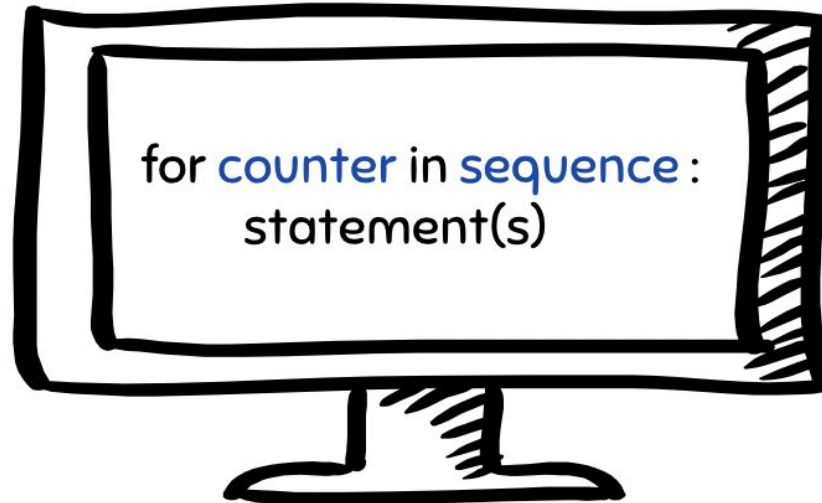
[]

For Loop

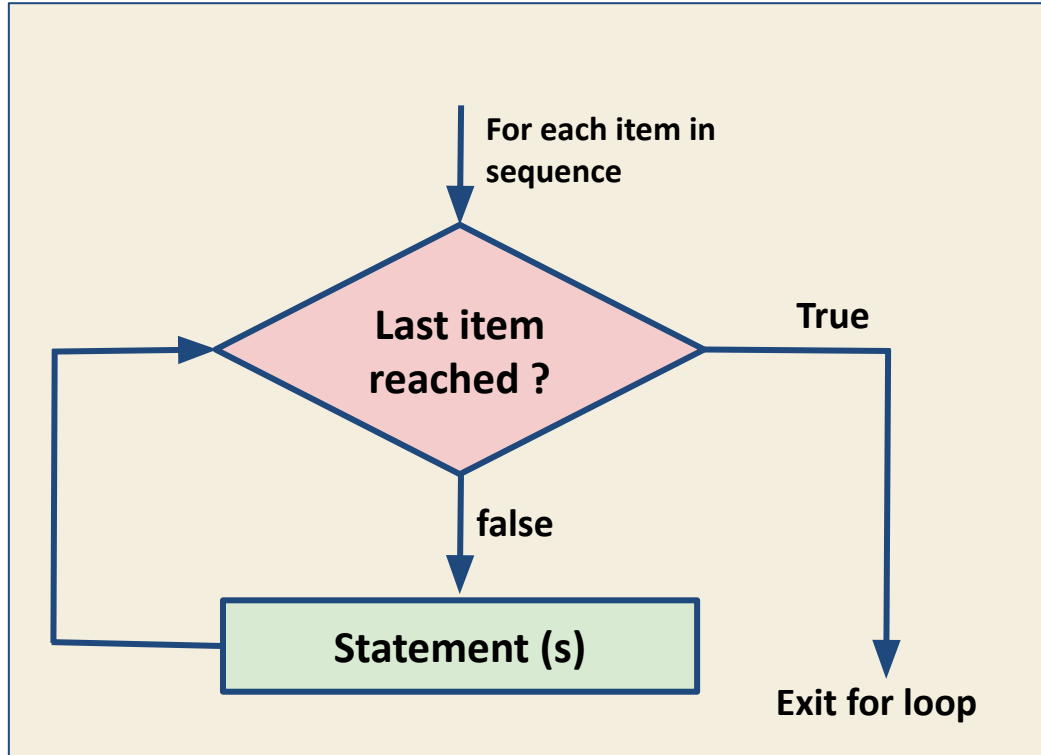
For Loop :

A **for** loop is used for iterating over a sequence.

Syntax :-



Flowchart – For Loop :



Let's Practice on the Playground!

Coding Assignment!

Question - 1 : Print the Line 5 Times

Write a program that prints the following line exactly 5 times, each on a new line: **"Khul Jaa Sim Sim!"**

Output :

```
Khul Jaa Sim Sim!  
Khul Jaa Sim Sim!  
Khul Jaa Sim Sim!  
Khul Jaa Sim Sim!  
Khul Jaa Sim Sim!
```

Question - 2 : Print 1 to N using Loop

Write a Python program to print all numbers from 1 to N.

Example 1 : Input N = 3

Output :

1 2 3

Example 2 : Input N = 5

Output :

1 2 3 4 5

Question – 3 : Print Odd Numbers in Range 1 to N

Write a program that takes a positive integer N as input and print all odd numbers from 1 to N (inclusive).

Example 1 : Input N = 5

Output :

1 3 5

Example 2 : Input N = 11

Output :

1 3 5 7 9

References :

Book_1 : Intro to Python for Computer Science and Data Science (Paul Deitel, Harvey Deitel)

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Quiz Time!



Please fill the feedback!



Thank You!