

# Loops in Python

A loop is used for iterating over a sequence (like a list, tuple, dictionary, string, or range). This allows you to execute a block of code repeatedly.





# Types Of Loop

1 For Loop

2 While Loop

# For Loop

A for loop is used for iterating over a sequence .



# Iterating Over a String

## Example - 1

```
name = "Hello"  
for i in name:  
    print(i)
```

## Example - 2

```
name = "Hello"  
for i in name:  
    if i == 'b':  
        print("Special character found!")  
    else:  
        print(i)
```

# Iterating Over a List

## Example - 1

```
colors = ["Red", "Green", "Blue", "hh"]
for color in colors:
    print(color) # Print the full color name
```

## Output

```
Red
Green
Blue
hh
```



# Range() Function

- A range() function generates a sequence of a numbers
- range(start, stop, step)

■ Start: The starting number (default is 0).

■ Stop: The number where the range ends (exclusive).

■ Step: The interval between numbers (default is 1).

# The if-else Statement

## Syntax

```
if condition:  
    # Code to execute if condition is True  
else:  
    # Code to execute if condition is False
```

## Example

```
number = 3  
if number > 5:  
    print("The number is greater than 5")  
else:  
    print("The number is less than or equal to  
5")
```

# Example

```
# Example 1: Range with a single argument
for k in range(5): # Generates numbers from 0 to 4
    print(k)

# Example 2: Range with start and stop
for k in range(0, 5): # Generates numbers from 0 to 4
    print(k)

# Example 3: Range with start, stop, and step
for k in range(0, 5, 2): # Generates numbers: 0, 2, 4
    print(k)

# Example 4: Reverse range with a negative step
for k in range(5, 0, -2): # Generates numbers: 5, 3, 1
    print(k)
```

# Nested Loops

## Definition

A loop inside another loop is called a nested loop. The inner loop runs completely for every single iteration of the outer loop.

## Example

```
colors = ["Red", "Green", "Blue", "hh"]
for color in colors:
    print(color) # Outer loop iterates through
colors
    for i in color:
        print(i) # Inner loop iterates through
characters in each color name
```