

Python for Loops – Detailed Notes

1. Introduction

- The `for` loop in Python is used to **iterate over a sequence** (like a list, tuple, string, or range).
 - Executes a block of code **for each item in the sequence**.
-

2. Basic `for` Loop

```
fruits = ["apple", "banana", "cherry"]
for fruit in fruits:
    print(fruit)
```

Output:

```
apple
banana
cherry
```

3. Using `range()` with `for` Loop

```
for i in range(5):
    print(i)
```

Output:

```
0
1
2
3
4
```

4. `for` Loop with Step Value

```
for i in range(2, 11, 2):  
    print(i)
```

Output:

```
2  
4  
6  
8  
10
```

5. Nested `for` Loops

```
for i in range(1, 4):  
    for j in range(1, 4):  
        print(i, "x", j, "=", i*j)  
    print("----")
```

Output:

```
1 x 1 = 1  
1 x 2 = 2  
1 x 3 = 3  
----  
2 x 1 = 2  
2 x 2 = 4  
2 x 3 = 6  
----  
3 x 1 = 3  
3 x 2 = 6  
3 x 3 = 9  
----
```

6. Using `break` in `for` Loop

```
for i in range(1, 6):  
    if i == 3:
```

```
        break
    print(i)
```

Output:

```
1
2
```

7. Using `continue` in `for` Loop

```
for i in range(1, 6):
    if i == 3:
        continue
    print(i)
```

Output:

```
1
2
4
5
```

8. Using `else` with `for` Loop

```
for i in range(1, 4):
    print(i)
else:
    print("Loop Completed")
```

Output:

```
1
2
3
Loop Completed
```

9. Iterating Over a String

```
word = "Python"  
for letter in word:  
    print(letter)
```

Output:

```
P  
y  
t  
h  
o  
n
```

10. Real-Life Example: Shopping Cart

```
cart = ["apple", "banana", "orange"]  
total_items = 0  
for item in cart:  
    print("Item:", item)  
    total_items += 1  
print("Total items:", total_items)
```

Output:

```
Item: apple  
Item: banana  
Item: orange  
Total items: 3
```

Summary

- **for loop** → Iterate over sequences
- **range()** → Generate numbers
- **break** → Exit loop early
- **continue** → Skip current iteration
- **else** → Runs if loop completes normally
- Can loop **over lists, tuples, strings, or ranges**



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