Loops in Python

1. Introduction:

Loops are used to repeat a block of code as long as a condition is true. Python supports two main types of loops: for and while.

2. while Loop:

Executes a block as long as the condition is true.

Example:

```python
x = 0
while x < 5:
    print(x)
    x += 1
```

3. for Loop:

Used to iterate over a sequence (like list, string, etc.)

Example:

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

4. range():

Generates a sequence of numbers.

range(start, stop, step)

Example:

```python
for i in range(1, 10, 2):
    print(i)
```

5. Loop Control Statements:

- break: Exit the loop

- continue: Skip current iteration

- pass: Do nothing

Example:

```
for i in range(5):
    if i == 3:
        break
    print(i)
```

6. Nested Loops:

A loop inside another loop.

Example:

```
for i in range(3):
    for j in range(2):
        print(i, j)
```

7. Practice Questions:

1. Print numbers from 1 to 10 using a while loop.

2. Create a multiplication table for a number.

3. Print all even numbers from 1 to 50.

4. Print a pattern using nested loops.

5. Count the number of digits in a given number.

8. Summary:

Loops are essential to repeat tasks and automate repetitive processes. They make your code efficient and reduce redundancy.