

What are Nested Loops?

- A **nested loop** means a loop inside another loop.
- The **outer loop** runs first → for each iteration of outer loop, the **inner loop** runs completely.
- Nested loops are used for **patterns, tables, and working with 2D data (like lists of lists)**.

Syntax:

```
for outer in range(x):  
    for inner in range(y):  
        # code block
```

Example: Number Pairs

```
for i in range(1, 4):           # outer loop  
    for j in range(1, 4):       # inner loop  
        print(i, j)
```

Key Points to Remember:

- Inner loop completes **fully** before outer loop moves to next value.
- Nested loops can be combined with **conditions (if/else)**.
- Most commonly used in **pattern printing** and **matrices (2D arrays)**.