Day 4 of 6 weeks Python course:

🕐 Time Breakdown (2 Hours)

Time Slot	Task
0:00 - 0:20	Introduction to Loops
0:20 - 0:50	`for` Loop with Examples
0:50 - 1:10	`while` Loop with Examples
1:10 - 1:30	Loop Control Statements (`break`, `continue`, `pass`)
1:30 - 2:00	Mini-Project: Multiplication Table Generator

1️⃣ What are Loops? ✅ Definition:Loops help execute a block of code multiple times, reducing redundancy. ✅ Types of Loops in Python: for loop → Used when the number of iterations is known. while loop → Used when the number of iterations is unknown. Loop Control Statements → break, continue, pass. ✅ Example Without Loops:

```
In [7]:  print("Python is fun!")
         print("Python is fun!")
         print("Python is fun!")
         print("Python is fun!")
         print("Python is fun!")
```

```
Python is fun!
Python is fun!
Python is fun!
Python is fun!
Python is fun!
```

✅ Example Using a Loop:

```
In [9]:  for i in range(5):
             print("Python is fun!")  # Prints 5 times
```

```
Python is fun!
Python is fun!
Python is fun!
Python is fun!
Python is fun!
```

```
In [ ]:  2️⃣ for Loop in Python:

         ✅ Syntax of a for Loop:
```

for variable in sequence: # Code block ✅ Example: Looping Through a Range

```
In [20]:  for i in range(7):
              print(i)  # Prints numbers from 0 to 6
```

```
0
1
2
3
4
5
6
```

💡 range(5) generates values 0, 1, 2, 3, 4, 5, 6(not 7) ✅ Looping Through a List

```
In [27]:  fruits = ["apple", "banana", "cherry", "watermelon"]

          for fruit in fruits:
              print(fruit)
```

```
apple
banana
cherry
watermelon
```

✅ Looping Through a String

```
In [31]:  for letter in "Python":
              print(letter)
```

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

✅ Using range(start, stop, step)

```
In [35]:  for num in range(1, 20, 3):  # Start=1, Stop=20, Step=3
              print(num)  # Output: 1, 4, 7, 10, 13, 16, 19
```

```
1
4
7
10
13
16
19
```

3️⃣ while Loop in Python ✅ Syntax of a while Loop: while condition: # Code block ✅ Example: Print Numbers Until 10

```
In [37]:  num = 1

          while num <= 10:
              print(num)
              num += 1
```

```
1
2
3
4
5
6
7
8
9
10
```

In [ ]: ✅ Example: Taking User Input Until Correct Answer

In [41]:
```python
password = ""

while password != "python123":
    password = input("Enter the password: ")

print("Access granted!")
```

```
Access granted!
```

4️⃣ Loop Control Statements (break, continue, pass) ✅ break → Stops the loop immediately

In [45]:
```python
for num in range(11):
    if num == 7:
        break    # Stops the loop at 4
    print(num)
```

```
0
1
2
3
4
5
6
```

💡 Output: 0 1 2 3 4 5 6 ✅ continue → Skips the current iteration and moves to the next one

In [51]:
```python
for num in range(11):
    if num == 5:
        continue    # Skips printing 2
    print(num)
```

```
0
1
2
3
4
6
7
8
9
10
```

💡 Output: 0 1 2 3 4 6 7 8 9 10 ✅ pass → Does nothing, used as a placeholder

In [69]:
```python
for num in range(5):
    if num == 3:
```

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```
        pass   # Placeholder
    print(num)
```

```
0
1
2
3
4
```

🎯 Mini-Project: Multiplication Table Generator

📌 Project Goal

- Ask the user for a **number**.

- Print the **multiplication table** for that number using a loop.

🖥️ Code Implementation

In [76]:
```python
# Step 1: Get user input
num = int(input("Enter a number: "))

# Step 2: Generate multiplication table
print(f"\nMultiplication Table for {num}:\n")
for i in range(1, 11):  # Loop from 1 to 10
    print(f"{num} x {i} = {num * i}")
```

```
Multiplication Table for 6:

6 x 1 = 6
6 x 2 = 12
6 x 3 = 18
6 x 4 = 24
6 x 5 = 30
6 x 6 = 36
6 x 7 = 42
6 x 8 = 48
6 x 9 = 54
6 x 10 = 60
```

🔍 Step-by-Step Explanation

📌 Step 1: Taking User Input

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```python
num = int(input("Enter a number: "))
```

- `input()` gets the number.

- `int()` converts it to an integer.

📌 **Step 2: Using a Loop for Multiplication**

python   Copy   Edit

```python
for i in range(1, 11):  # Loops from 1 to 10
    print(f"{num} x {i} = {num * i}")
```

- `range(1, 11)` generates numbers **1 to 10**.
- `num * i` calculates each multiplication step.

✅ **Example Output:**

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```
Enter a number: 5

Multiplication Table for 5:

5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
...
5 x 10 = 50
```

Summary of Day 4 ✔️ Learned for and while loops ✔️ Practiced loop control statements (break, continue, pass) ✔️ Completed a Mini-Project: Multiplication Table Generator