

Teaching Samples Portfolio with Learner Questions

Juan Esteban Silva Romero

Sample 1: Python Loops – The Loop that Saves You Time

Learning Goal: Introduce the concept of loops in Python interactively.

Step 1: The Problem

Imagine you want to greet 5 friends. Writing one line per greeting is repetitive. How can we make Python do the work for us?

```
for i in range(5):  
    print("Hello, friend!")
```

Output:

```
Hello, friend!  
Hello, friend!  
Hello, friend!  
Hello, friend!  
Hello, friend!
```

Step 2: Personalizing the Loop

```
friends = ["Ana", "Luis", "Camila", "Mateo", "Sofia"]  
for name in friends:  
    print("Hello,", name + "!")
```

Output: Hello, Ana! ... Hello, Sofia!

Reflection: Loops save time, reduce repetition, and scale easily.

Possible Learner Questions & Answers

Q1: What does range(5) actually mean? Why does it start at 0 sometimes?

Answer: range(5) means: 0, 1, 2, 3, 4. It gives 5 numbers total, starting at 0 because computers count from 0.

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

Q2: Why do we write for i in range(5):? What does the i do?

Answer: i is a variable. Each time the loop runs, i takes a new value from the range.

```
for i in range(5):  
    print("This is round", i)
```

Q3: What happens if I change the number in range(5) to something else?

Answer: The number tells Python how many times to repeat. For example: range(3) runs 3 times, range(10) runs 10 times.

Q4: What happens if I forget the indentation (spaces before print)?

Answer: Indentation tells Python which code belongs to the loop. Without it, you get an error.

```
for i in range(5):  
print('Hello')    # Error!
```

Q5: Why are there different colors for different words and values?

Answer: That's called syntax highlighting. It makes code easier to read: keywords, strings, and numbers get different colors.

Sample 2: Banking, Percentages, and Probability

Learning Goal: Apply percentages and probability to a real-world financial decision.

Step 1: The Scenario




A credit card offers 2% cashback with a \$95 annual fee. Is it worth it?

Step 2: The Math Behind It

$$0.02 \times \text{Spending} = 95 \rightarrow \text{Spending} = 4,750$$

Step 3: Adding Probability

If 40% of customers spend \$2k–\$4k, 50% spend \$4k–\$8k, and 10% spend \$8k+:

- 40%  Won't break even
 - ~25%  Might break even
 - 10%  Definitely benefit
- Probability \approx 35% benefit.

Step 4: Reflection

Percentages show cost vs. benefit, probability shows who benefits most. Math & logic help make smart financial choices.

Learner Questions & Answers

Q1: Why do we divide \$95 by 0.02 to find the spending amount?

Answer: Because cashback is $0.02 \times \text{Spending} = 95$. To solve for Spending, divide $95 \div 0.02$.

Q2: Why do we say 40% of customers won't benefit? What if they spend close to \$4,750?

Answer: If spending is less than 4,750, they don't cover the fee, even if they are very close.

Q3: How do we estimate that ~25% of people in the 4k–8k group will break even?

Answer: Because about half of that group will spend above 4,750, assuming even distribution.

Q4: Why use probability at all? Isn't it enough to just say some customers benefit?

Answer: Probability gives a clear, numerical picture: about 35% benefit, instead of vague guesses.

Q5: Why do percentages and fees matter so much in banking?

Answer: Small numbers add up. 2% cashback can mean hundreds of dollars; fees can cancel the benefit.