

## Chapter 3: Control Flow and Loops

### Lesson 3 & 4: Loops & Combining Loops and Conditionals

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#### For Loops

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

```
# Basic for loop with a list
fruits = ["apple", "banana", "cherry"]
for fruit in fruits:
    print(fruit)

# Using range()
for i in range(5): # Prints 0 to 4
    print(i)
```

#### While Loops

Repeats as long as a condition is true.

```
# Basic while loop
count = 0
while count < 5:
    print(count)
    count += 1 # Increment to avoid infinite loop
```

#### Key Controls

- **break**: Exit the loop early.
- **continue**: Skip to the next iteration.

```
for i in range(10):
    if i == 3:
        continue # Skips 3
    if i == 7:
        break # Stops at 7
    print(i)
```

#### Exercises for practice

##### 1. Sum of Sales

**Task:** Calculate the total of a list of sales amounts.

**Input:** [25.50, 14.99, 33.25, 9.75]

**Expected Output:** Total: \$83.49

**Hint:** Use a `for` loop to iterate over the list and add each amount to a running total.

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## 2. Even Number Printer

**Task:** Print all even numbers from 1 to 20.

**Expected Output:** 2 4 6 8 10 12 14 16 18 20

**Hint:** Use a `for` loop with `range()` and check if each number is even using `%`.

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## 3. Password Retry Limit

**Task:** Ask the user for a password until they enter "secret" or reach 3 attempts.

**Expected Output:**

- If correct: Access granted!
- If 3 attempts fail: Locked out!

**Hint:** Use a `while` loop with a counter and `input()`.

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## 4. Inventory Cleanup

**Task:** From a list of stock quantities, print only items with more than 0 in stock, stopping if a negative value is found.

**Input:** [5, 12, 0, 8, -1, 10]

**Expected Output:** In stock: 5 In stock: 12 In stock: 8 Negative stock detected!

**Hint:** Use a `for` loop with `continue` and `break`.

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## 5. Email Validator

**Task:** Check a list of emails and print "Valid" if they contain "@", otherwise skip them.

**Input:** ["user@domain.com", "no-at-sign", "test@site.org", "plain"]

**Expected Output:** Valid: user@domain.com Valid: test@site.org

**Hint:** Use a `for` loop and `continue` to skip invalid emails.

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## 5. Countdown Timer

**Task:** Simulate a countdown from 10 to 1, printing each number, then "Liftoff!" at the end.

**Expected Output:** 10 9 8 7 6 5 4 3 2 1 Liftoff!

**Hint:** Use a `while` loop with a decreasing counter.

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