DAY 1: Python basics

1. What is Python?

- High-level, interpreted programming language
- Renowned for user-friendliness, clarity, and versatility
- Extensive applications:
  - Web development
  - Data analysis
  - Artificial intelligence
  - Scientific computing
  - Automation
- Favored choice among developers and data scientists
- Comprehensive standard library
- A rich ecosystem of third-party packages
- Facilitates rapid development and prototyping
- Strong community support and thorough documentation
- Accessible to beginners; powerful for advanced users
- Compatible with multiple platforms
- Integrates well with other languages and tools
- Appeals to diverse programming environments

2. Data Types

Python includes several built-in data types:

1. **Integer (int):**
   - Whole numbers, such as 10 or -3.
2. **Float (float):**
   - Numbers that contain decimals, like 3.14 or -0.5.
3. **String (str):**
   - A sequence of characters, for instance, "Hello" or 'Python'.
4. **Boolean (bool):**
   - Represents values of True or False.
5. **None:**
   - Indicates the absence of a value, represented as None.

3. Variables

- Variables store data in memory
- Example:

```
age = 24
name = "Thapelo"
is_student = True
```

Rules for Naming Variables:

- It must start with a letter or an underscore.
- You cannot start with a number.
- It can only contain letters, numbers, and underscores.
- Case-sensitive (e.g., Name and name are different).

4. Printing Output

Use the print() function to display text or values:

```
print("Hello, Python!")  # Prints a string
print(5 + 3)             # Prints the result of a math operation
```

5. Checking Data Types

Use the type() function to find the data type of a variable:

```
x = 10
print(type(x))  # Output: <class 'int'>
```

Exercises for Day 1

Exercise 1: Storing and Printing Data

1. Create variables to store:
   - Your name
   - Your age
   - Whether you like Python (True or False)
2. Print the variables in a sentence.

Exercise 2: Basic Math with Variables

1. Create two variables x and y with values of your choice.
2. Perform the following operations:
   - Addition
   - Subtraction
   - Multiplication
   - Division

- Modulus (remainder of division)

Exercise 3: Exploring Data Types

1. Assign a value of each data type to a variable (e.g., int, float, str, bool, None).
2. Print the variable along with its data type.

Exercise 4: Swapping Variables

Write a program to swap the values of two variables.

Exercise 5: Simple User Input

1. Ask the user for their name and age.
2. Print a greeting message using their input.

Exercise 6: Arithmetic Operations with User Input

Write a program that:

1. Asks the user to input two numbers.
2. Performs and prints the results of addition, subtraction, multiplication, division, and modulus.

Exercise 7: Area and Perimeter of a Rectangle

Write a program that:

1. Prompts the user to input the length and width of a rectangle.
2. Calculates and prints the area and perimeter.

Formulae:

- Area = length × width
- Perimeter = 2 × (length + width)

Exercise 8: Temperature Conversion

Create a program that:

1. Accepts a temperature in Celsius from the user.
2. Converts it to Fahrenheit using the formula: