Python Basics Practice

Python Course · Module 2 Practice

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Module 2 Practice — Variables, Types & Operators

This practice module sits between Modules 2 and 3.

Goals:

- Get more **hands-on** with variables and types
- Become fluent with **input/output** and **type casting**
- Practice arithmetic, comparison, and logical operators
- Prepare your brain for data structures in Module 3

Use this as a **lab deck**: lots of short exercises, less theory.

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Warm-Up — Quick Questions

Without running code, guess the results:

```
1 + 2 * 3
(1 + 2) * 3
10 / 3
10 // 3
10 % 3
```

Then open a Python REPL or script file and **verify** your answers.

Why? Getting a "feel" for operator behavior makes later code easier to read.

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Practice 1 — Simple Calculator

Task:

Create calculator.py inside projects/module2_basics/ that:

1. Asks the user for two numbers.
2. Converts them to float.
3. Computes and prints:
   ◦ sum
   ◦ difference
   ◦ product
   ◦ quotient (second not zero)

Example interaction:

```
Enter first number: 10
Enter second number: 3
Sum: 13.0
Difference: 7.0
Product: 30.0
Quotient: 3.3333333333
```

Try adding **rounding** with round(value, 2).

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Practice 2 — BMI Calculator

Create bmi.py that:

1. Asks for weight in kg (float)
2. Asks for height in meters (float)
3. Computes BMI = weight / (height ** 2)
4. Prints BMI rounded to 1 decimal place

Add basic classification (just using if/elif):

- BMI < 18.5 → "Underweight"
- 18.5 ≤ BMI < 25 → "Normal"
- 25 ≤ BMI < 30 → "Overweight"
- ≥ 30 → "Obese"

This connects arithmetic, comparison operators, and string formatting.

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Practice 3 — String Playground

In `strings_play.py`:

1. Ask for the user's full name (one line of text).
2. Print:
   ◦ Length of the string
   ◦ Uppercase version
   ◦ Lowercase version
   ◦ First and last character (if not empty)
3. Create a **short username** suggestion:
   ◦ first 3 letters of the name (no spaces)
   ◦ plus the string length

Example:

```
Full name: Ada Lovelace
Length: 12
Upper: ADA LOVELACE
Lower: ada lovelace
Short username: Ada12
```

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Practice 4 — Truth Tables with and / or / not

In logic_table.py, without using user input:

    1. Create variables a = True, b = False.
    2. Print a simple truth table:

```
a       b       a and b    a or b    not a
True    False   False      True      False
...
```

Use **f-strings** for clean formatting.

Goal: see how logical operators behave for all combinations.

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Practice 5 — Age Gate

age_gate.py:

1. Ask user for age (convert to int).
2. Use comparisons and and/or to decide:
    ◦ < 13 → "Child account"
    ◦ 13–17 → "Teen account"
    ◦ 18+ → "Adult account"
3. Use a boolean variable has_parent_consent (True/False) and update messages:
    ◦ If < 18 and no consent → "Access denied"

This will warm you up for more structured if logic and loops later.

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Practice 6 — Simple Tip Calculator

tip.py:

1. Ask for bill amount (float).
2. Ask for desired tip percentage (e.g., 10, 15, 20).
3. Compute tip and total.
4. Print results with 2 decimal places.

Extra: allow the user to input tip as either 0.15 or 15, and handle both correctly.

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Mini Project — Profile Summary

Create profile.py that:

1. Asks for:
   ◦ name (str)
   ◦ age (int)
   ◦ city (str)
   ◦ favorite number (int)
2. Uses arithmetic and logic to compute:
   ◦ age next year
   ◦ whether the favorite number is even or odd
3. Prints a nicely formatted multi-line summary using an f-string.

Example output:

```
Hello, Ada!
You live in London and next year you will be 37.
Your favorite number 42 is even.
```

This project consolidates most of Module 2 concepts before you meet lists and dicts.

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