**1. Numeric Types (int, float, complex)**

**Practice Questions:**

1. Write a Python program to:
   * Take two numbers as input.
   * Display their sum, difference, product, quotient, and power.
2. Create a complex number z = 4 + 5j.
   * Print its real and imaginary parts.
   * Find the conjugate using .conjugate().
3. Convert an integer to float and vice versa using float() and int().

💡 *Hint:*  
Use type() after each conversion to verify the type.

**📝 2. Text Type (str)**

**Practice Questions:**

1. Given text = "python programming", perform:
   * Convert to uppercase and lowercase.
   * Replace "python" with "Python".
   * Count occurrences of "p".
   * Print the first and last characters.
2. Write a program that takes a user’s full name and prints:
   * Their initials (e.g., Amit Kumar → A.K.)
   * The total number of characters excluding spaces.

💡 *Hint:*  
Use .split(), .replace(), and string slicing.

**📚 3. Sequence Types (List, Tuple, Range)**

**Practice Questions:**

1. Create a list of 5 fruits:
   * Add one more fruit at the end.
   * Remove the second fruit.
   * Sort the list alphabetically.
2. Create a tuple coordinates = (12.5, 45.8, 33.2)
   * Print the second value.
   * Try to modify one element (observe the error).
3. Use a range() to print all even numbers between 1 and 20.

💡 *Hint:*  
Remember — tuples are **immutable**, lists are **mutable**.

**🌳 4. Set Type**

**Practice Questions:**

1. Create two sets:  
   set1 = {1, 2, 3, 4, 5} and set2 = {4, 5, 6, 7, 8}
   * Find union, intersection, and difference.
2. Convert a list [1, 2, 2, 3, 4, 4, 5] into a set.
   * Print both and explain the difference.
3. Check if "apple" exists in fruits = {"apple", "banana", "cherry"}.

💡 *Hint:*  
Sets automatically remove duplicates.

**🧭 5. Mapping Type (map function)**

**Practice Questions:**

1. Use map() to:
   * Convert a list of integers [1, 2, 3, 4, 5] to their cubes.
2. Combine two lists:
3. a = [10, 20, 30]
4. b = [1, 2, 3]

Use map() and a lambda function to subtract elements of b from a.

1. Rewrite one of the above map() problems using **list comprehension**.

💡 *Hint:*  
Both map() and list comprehension can transform lists — try both ways.

**✅ 6. Boolean Type**

**Practice Questions:**

1. Write a program to:
   * Ask the user for their age.
   * Print True if age ≥ 18, else False.
2. Given x = 15 and y = 20, print the result of:
   * x > y
   * x == y
   * x != y
   * x <= y or y > 30
3. Create a boolean variable is\_logged\_in = False.  
   If it's False, print “Please log in.”

💡 *Hint:*  
Booleans often control **if-else** logic.

**🚫 7. None Type**

**Practice Questions:**

1. Write a function find\_max(lst) that returns:
   * The maximum number if the list is not empty.
   * None if the list is empty.  
     Then check using if result is None: to print a message.
2. Create a variable data = None and test:
   * if data: vs. if data is None:  
     Observe the difference.
3. Write a function that asks for a name input.
   * If no name is entered, return None.
   * Otherwise, greet the user.

💡 *Hint:*  
None represents *absence of value*, not False or 0.

**Section A: String Operations (1–5)**

**1.** Write a program to take a string from the user and:

* Print the first 3 and last 3 characters.
* Print the length of the string.

**2.** Given:

text = "Python is Fun"

Perform the following:

* Convert it to lowercase.
* Replace "Fun" with "Powerful".
* Check if "Python" exists in the string.

**3.** Concatenate the following:

first = "Good"

second = "Morning"

Output: "Good Morning!"  
Also repeat the string **3 times** using the \* operator.

**4.** Take a user input for their name and print:

Hello, <name>, your name has <length> characters.

**5.** Write a Python program to extract the word **“Programming”** from:

s = "I am learning Python Programming"

using slicing.

**💬 Section B: Input & Output Formatting (6–10)**

**6.** Write a Python program that asks the user to enter two numbers and prints:

* Their sum using an **f-string**.

Example Output:

Enter first number: 5

Enter second number: 8

The sum is 13.

**7.** Take inputs: name, course, and marks (float).  
Display:

Student <name> from <course> scored <marks> marks.

Use the .format() method for formatting.

**8.** Write a program to input an employee’s:

* Name
* Age
* Salary

Then print using **% formatting** like this:

Employee Name: Rahul, Age: 28, Salary: 55000.75

**9.** Ask the user for a number, then print:

* Double the number
* Square of the number  
  (use int(input()) to convert input)

**10.** Create a program that asks for a city and country, then prints:

I live in <City>, <Country>.

Use **f-strings** for this.

**➕ Section C: Operators (11–15)**

**11. Arithmetic Operators:**  
Take two numbers from the user and print their:

* Sum, Difference, Product, Division, Modulus, and Exponentiation.

**12. Comparison Operators:**  
Given x = 15, y = 20, print:

* Whether x is greater, equal, or smaller than y.

**13. Logical Operators:**  
Write a program that checks:

* If an entered number is between 10 and 50 (inclusive) using and.
* If it’s **outside** that range using or.

**14. Assignment Operators:**  
Initialize a = 5.  
Use each of the following operators sequentially and print the result after each step:  
+=, -=, \*=, /=

**15. Combine Concepts (Mini Challenge):**  
Take inputs:

* name
* age
* marks

Print a formatted message:

Hi <name>, your age is <age> and you have scored <marks> marks.

Then check if marks >= 50:

* If True → print "You passed!"
* Else → print "You failed!"