**Basic Arithmetic and Type Identification**

* Create three variables: one integer, one float, and one complex number.
* Print each variable and use the type() function to confirm their data types.

**Arithmetic with Mixed Types**

* Create one int variable (a) and one float variable (b).
* Print the sum, difference, product, and quotient of a and b.
* Print the type() of each result (notice how types may change).

**Comparison Operators**

* Let x = 10 and y = 7.
* Print the results of x > y, x < y, x == y, and x != y.
* After observing the output, explain why each result is True or False in comments.

**Boolean Variables**

* Define a variable status = True.
* Print the value of status and confirm it is a boolean using type(status).
* Reassign status to False and confirm its type again.

**String Creation and Length**

* Create a string variable, for example text = "Hello World".
* Use len(text) to print its length.
* Use type(text) to verify it is a string.

**String Indexing**

* With the string s = "Python", print each character. Then print just the first and last characters using negative indexing.

**String Slicing**

* Let lang = "Programming".
* Print the substring from index 0 to index 4.
* Print the substring from index 3 to the end.
* Print the substring that omits the first 2 and last 2 characters.

**Exploring len() on Slices**

* Continue using lang = "Programming".
* Slice lang to get "Program" and store it in a variable part1.
* Print len(part1) and comment how it differs from len(lang).

**String Methods – Case Conversion**

* Let phrase = "Hello, Python!".
* Print phrase.upper() and phrase.lower().
* Print the original phrase to show it remains unchanged (strings are immutable).

**Combining Strings**

* Create two strings, str1 = "Data" and str2 = "Science".
* Combine them into a single string with a space in between and print it.
* Print the length of the combined string.

**In-Place vs. Reassignment with String Methods**

* Let word = "example".
* Call word.upper() but do not store it, then print word.
* Now set word = word.upper(), then print word.
* Comment on why the second print is different from the first.

**Arithmetic Operator Precedence**

* Define a = 5, b = 3, c = 2.
* Print the result of the expression a + b \* c.
* Print the result of (a + b) \* c.
* In comments, explain how operator precedence affects the outcome.

**String Index Out of Range**

* Let text = "Hello".
* Attempt to access an index that doesn’t exist, like text[10].
* Observe the error message (IndexError) and explain why it happens in comments.

**Equality vs. Identity Check (Conceptual Explanation)**

* Create two variables with the same string value, s1 = "test" and s2 = "test".
* Use the == operator to compare them, then use the is operator.
* Explain in comments what each comparison checks.

**Creating and Checking a Complex Number**

* Define z = 3 + 4j.
* Print the real part (z.real) and the imaginary part (z.imag).
* Confirm that its type is complex using type(z).

**Comparisons with Floats**

* Let f1 = 0.1 + 0.2 and f2 = 0.3.
* Print f1 == f2.
* Print the actual values of f1 and f2 to explain any difference in the comparison outcome (floating-point precision).