🧮 Assignment: String in Python

🎯 **Objective:**
Develop a strong understanding of how strings work in Python, including their immutability, and practice manipulating string data using built-in functions and operations.

🟢 Level 1: Beginner – String Basics

✅ Task 1: String Creation & Printing

- Create three different types of strings:
  - A single-line string
  - A multi-line string
  - A string with both single and double quotes

✅ Task 2: Basic String Operations

- Concatenate two strings
- Repeat a string 3 times
- Print the length of a string using `len()`

✅ Task 3: String Indexing & Slicing

Given `text = "PythonProgramming"`

- Print the first 6 characters
- Print the last 3 characters
- Reverse the string using slicing
- Print every second character

✅ Task 4: String Input

- Ask the user to input their name and print a greeting using that name (e.g., "Hello, John!")

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🟡 Level 2: Intermediate – Manipulation & Formatting

✅ Task 5: Case Manipulation

s = "Python is Amazing"

Convert to all uppercase

Convert to all lowercase

Capitalize the first letter

Title case the string

Swap the case of each character

✅ Task 6: String Search & Replace

- Find the index of the word `"is"` in the string
- Replace `"Amazing"` with `"awesome"`

✅ Task 7: String Split and Join

data = "apple,banana,cherry"

Split the string into a list

Join the list using a semicolon `;`

✅ Task 8: Count and EndsWith

- Count how many times `"a"` appears
- Check if the string ends with `"ing"`
- Check if the string starts with `“Py"`

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🔵 Level 3: Advanced – Real-World Scenarios

✅ Task 9: Email Validator

Write a function to validate whether a given string is a valid email address (basic check: contains `@` and `.` and ends with `.com`).

✅ Task 10: Word Frequency Counter

Given a paragraph, count how many times each word occurs. Ignore case and punctuation.

Example:

text = "Python is easy. Python is powerful. Python is fun!"

{'python': 3, 'is': 3, 'easy': 1, 'powerful': 1, 'fun': 1}

✅ Task 11: Palindrome Checker

Write a function that checks whether a given string is a palindrome (ignoring spaces, punctuation, and case).

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🔴 Level 4: Expert – Algorithmic & Interview Style Challenges

✅ Task 12: Longest Word Finder

Write a function that takes a string and returns the longest word in it.

✅ Task 13: Anagram Checker

Write a function that checks if two strings are anagrams of each other.

✅ Task 14: Compress Repeating Characters

Given a string, compress it by replacing repeating characters with the character followed by the count.

Example
"aaabbbbcc" → “a3b4c2"

✅ Task 15: Custom Implementation – `replace()`

Write your own version of the `replace()` function without using built-in `str.replace()`.

✅ Task 16: Find First Non-Repeating Character

Write a function that finds the first character in a string that does not repeat.