■ Python Learning Notes

■ Chapter 3 – Strings in Python

Strings are one of the most important data types in Python. They represent text and allow us to store, modify, and analyze words, sentences, or even entire documents.

■ What is a String?

A string is a sequence of characters enclosed within single, double, or triple quotes.

```
name = 'Vishwas'
greeting = "Hello, World!"
paragraph = """This is a multi-line string."""
```

■ String Basics

Strings are immutable, meaning they cannot be changed once created. You can, however, access parts of them using indexing or slicing.

```
word = "Python"
print(word[0]) # P (first letter)
print(word[-1]) # n (last letter)
print(word[0:4]) # Pyth
```

■ Common String Operations

- 'Hello' + ' World' → Concatenation
- 'Hi! ' * 3 → Repetition
- len('Python') → Length
- 'a' in 'Data' → Membership check

■ Changing Case

```
text = "python is fun"
print(text.upper()) # PYTHON IS FUN
print(text.lower()) # python is fun
print(text.title()) # Python Is Fun
print(text.capitalize()) # Python is fun
```

✂■ Trimming and Replacing

```
msg = " Hello Python "
print(msg.strip()) # removes spaces
print(msg.replace("Hello", "Hi")) # replaces word
```

■ Searching in Strings

```
sentence = "Learning Python is easy"
```

```python
print(sentence.find("Python")) # 9
print(sentence.count("a")) # 2
print("Python" in sentence) # True
```

■ String Formatting

```python
name = "Vishwas"
age = 18
print(f"My name is {name} and I am {age} years old.")
print("My name is {} and I am {} years old.".format(name, age))
```

■ Looping Through a String

```python
for char in "Python":
print(char)
```

■ String Slicing Deep Dive

```python
text = "Python"
print(text[1:4]) # yth
print(text[:4]) # Pyth
print(text[::2]) # Pto
print(text[::-1]) # nohtyP (reversed)
```

■ Checking String Properties

```python
text = "Python123"
print(text.isalpha()) # False
print(text.isdigit()) # False
print(text.isalnum()) # True
print("python".islower()) # True
```

■ Real-Life Example

```python
name = input("Enter your name: ")
if name.startswith("A"):
print("Your name starts with A!")
else:
print("Nice name!")
```

■ Mini Challenge: String Analyzer

```python
sentence = input("Enter a sentence: ")
vowels = "aeiou"
for v in vowels:
print(v, ":", sentence.lower().count(v))
print("Reversed:", sentence[::-1])
```

■ Summary

- Strings store text data and are enclosed in quotes.
- They are immutable but can be sliced, formatted, and combined.
- Use f-strings for easy formatting.
- Mastering string functions makes data handling fun and easy!

■ "Mastering strings means you can talk to your computer fluently!" ■