String in Python

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1. Definition of String

A string is a sequence of characters enclosed in single or double quotes.
Strings are used to store text data in Python. You can perform various operations and methods on them.

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2. String Operations

2.1. Concatenation

Concatenation means joining strings together using the + operator.

```
first_name = "Sara"
family_name = "Ibrahimi"
full_name = first_name + " " + family_name
print(full_name)
# Output: Sara Ibrahimi
```

2.2. Repetition

Repetition uses the * operator to repeat the string several times.

```
print(first_name * 3)
# Output: SaraSaraSara
```

2.3. The len() Function

The len() function returns the number of characters in a string.

```
print(len(full_name))
# Output: 12
```

2.4. Indexing

Each character in a string has an index (position number).
Indexing starts from 0 for the first character.

```
first_name = "Sara"
print(first_name[0]) # S
print(first_name[1]) # a
print(first_name[len(first_name) - 1]) # a (last character)
```

💡 Note:
The last index is always len(string) - 1.

2.5. Slicing

Slicing is used to get a part (substring) of the string.
Syntax: string[start:end]

```
print(first_name[0:2]) # Sa
print(family_name[2:6]) # rahi
```

The slice starts from the start index (included).
It ends before the end index (excluded).

```
print(family_name[3:])   # ahimi
print(family_name[:4])   # Ibra
```

Let's use this text for the examples:

```
text = "Programming with Python"
```

2.6. find()

Finds the position of a substring inside the text.

```
print(text.find("Python"))
# Output: 18
```

2.7. replace()

Replaces one substring with another.

```
print(text.replace("Python", "Java"))
# Output: Programming with Java
```

2.8. count()

Counts how many times a character or substring appears.

```
print(text.count("m"))
# Output: 2
```

2.9. upper()

Converts all characters to uppercase.

```
print(text.upper())
# Output: PROGRAMMING WITH PYTHON
```

2.10. lower()

Converts all characters to lowercase.

```
print(text.lower())
# Output: programming with python
```

2.11. title()

Converts the first letter of each word to uppercase.

```
print(text.title())
# Output: Programming With Python
```

2.12. Membership Operators: in and not in

These operators check whether a substring exists in another string.

```
text = "Programming with Python"
print("Python" in text) # True
print("Java" not in text) # True
```

Explanation:

- "Python" in text → checks if “Python” exists in text.
- "Java" not in text → checks if “Java” does not exist in text.
