

Understanding Strings and String Methods in Python

A COMPREHENSIVE GUIDE

What is a String in Python?

- A string is a sequence of characters enclosed within single, double, or triple quotes.
- Example: 'Hello, World!', "Python", """Multiline String""".
- Strings are immutable, meaning they cannot be changed after creation.

Creating Strings in Python

- Single quotes: 'Hello'
- Double quotes: "Python"
- Triple quotes for multiline: """This is a multiline string"""

```
python
```

```
single_quote_str = 'Hello'  
double_quote_str = "Python"  
multiline_str = '''This is a  
multiline string'''
```

Accessing Characters in a String

- Strings are indexed, allowing access to characters using indices.
- Index starts at 0 and go in both direction positive and negative.

```
my_str = "Python"  
print(my_str[0]) # Output: 'P'  
print(my_str[-1]) # Output: 'n'
```

Common String Methods in Python

- Introduce key methods: `len()`, `lower()`, `upper()`, `strip()`, `split()`, `replace()`, `find()`, `join()`, `startswith()`, `endswith()`, `count()`.
- Mention that these methods return new strings and do not modify the original string.

len() Method

- Returns the length of a string.

```
python
```

```
my_str = "Hello, World!"  
print(len(my_str)) # Output: 13
```

lower() and upper() Methods

- lower(): Converts all characters to lowercase.
- upper(): Converts all characters to uppercase.

```
my_str = "Python"  
print(my_str.lower()) # Output: 'python'  
print(my_str.upper()) # Output: 'PYTHON'
```

strip(), lstrip(), rstrip() Methods

- strip(): Removes leading and trailing whitespace.
- lstrip(): Removes leading whitespace.
- rstrip(): Removes trailing whitespace.

```
my_str = "  Hello, World!  "
print(my_str.strip()) # Output: 'Hello, World!'
print(my_str.lstrip()) # Output: 'Hello, World!  '
print(my_str.rstrip()) # Output: '  Hello, World!'
```


split() Method

- Splits a string into a list of substrings based on a delimiter.
- Default delimiter is space.

```
my_str = "Hello, World!"  
print(my_str.split()) # Output: ['Hello,', 'World!']  
print(my_str.split(',')) # Output: ['Hello', ' World!']
```

join() Method

- Joins elements of an iterable (e.g., list) into a single string with a specified separator.

```
words = ['Hello', 'World']  
print(' '.join(words)) # Output: 'Hello World'
```

replace() Method

- Replaces occurrences of a substring with another substring.

```
my_str = "Hello, World!"  
print(my_str.replace('World', 'Python')) # Output: 'Hello, Python!'
```

find() Method

- Returns the index of the first occurrence of a substring. Returns -1 if not found.

```
my_str = "Hello, World!"  
print(my_str.find('World')) # Output: 7  
print(my_str.find('Python')) # Output: -1
```

startswith() and endswith() Methods

- startswith(): Checks if a string starts with a specified prefix.
- endswith(): Checks if a string ends with a specified suffix.

```
my_str = "Hello, World!"  
print(my_str.startswith('Hello')) # Output: True  
print(my_str.endswith('World!'))  # Output: True
```

count() Method

- Counts the occurrences of a substring in a string.

```
my_str = "Hello, World!"  
print(my_str.count('l')) # Output: 3
```

String Slicing

- Extracts a substring using a range of indices.

```
my_str = "Hello, World!"  
print(my_str[0:5]) # Output: 'Hello'  
print(my_str[:5])  # Output: 'Hello'  
print(my_str[7:])  # Output: 'World!'
```

Business Use cases

- Use Case1: Data Cleaning and Preparation
- Scenario: Cleaning up customer data imported from different sources.
- Methods Used: strip(), lower(), replace()

- **Problem:** Customer names have extra spaces and inconsistent capitalization.

```
customer_name = "  John Doe  "
cleaned_name = customer_name.strip().lower().replace(' ', '_')
print(cleaned_name) # Output: 'john_doe'
```




THANK YOU

HAPPY LEARNING!