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Chapter 2.3 Strings

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Introduction to Strings

Strings are iterable set of characters enclosed within single-quotation marks `' '` or double-quotation marks `" "`. Multiline strings are enclosed with triple single-quotation marks `'''` or triple double-quotation marks `"""`. Strings are generally immutable, but when we try to change the value of string to a variable, a completely new object is created and assigned to the variable. With strings created with single quotes `' '`, we can use double quotes `"""` inside it without any escape characters. Some of the examples of strings are as follows:

```
name = 'John Doe'           # String with single quotation marks
full_name = "I am John Doe" # String with double quotation marks

desc = 'He said, "I am John Doe".'
```



```
# Multi line strings
essay = '''Strings are iterable set of characters enclosed within
single-quotation marks or double-quotation marks.
'''
```

If we want to have single quote inside a single quoted string and a double quote inside a double quoted string then, we need to escape the characters with backslash `\`.

Escape Characters

Escape character is a character, that invokes the alternative interpretation of some of the characters that we can not directly type inside the string. For example if we want to add a new line inside a string of python, pressing the `Enter` key for new line tries to terminate the statement so we need to type `\n` as the escape character for `Enter`. Some of the escape characters and their meanings are as follows:

Escape Character	Expected Behavior
<code>\t</code>	Tabs
<code>\n</code>	New Line
<code>\"</code>	Double quotation Mark
<code>\'</code>	Single Quotation Mark
<code>\\</code>	Backslash
<code>\a</code>	Ascii Bell
<code>\b</code>	Backspace
<code>\r</code>	Carriage Return
<code>\v</code>	Vertical Tab

for more detail about escape characters, please see <https://docs.python.org>

Examples:

```
content_1 = 'This is the first line.\nThis is the second line.'
print(content_1)

content_2 = 'John said, "I\'m a good student".'
print(content_2)
```

Output:

```
This is the first line.
This is the second line.
John said, "I'm a good student".
```

String Concatenation

Concatenation is the process of merging 2 or more strings. We generally use `+` operator to merge 2 strings.

```
first_name = 'John'
last_name = 'Lennon'
full_name = first_name + last_name    # 'JohnLennon'
```

Finding out the length of the string

We can find out the length of the string by 2 different ways which are as follows:

- `str.__len__()` method

- `len()` function

```
paragraph = 'A quick brown fox jumps over the lazy dog.'  
print(paragraph.__len__())    # 42  
print(len(paragraph))        # 42
```

Capitalization, Upper Case and Lower Case conversion

python has plenty of options in changing the case of the string. Capitalization is the process of capitalizing the first character of the string. Upper and Lower case conversion just converts the string to its respective cases.

```
'john'.capitalize()    # John  
'john'.upper()         # JOHN  
'JOHN'.lower()         # john  
  
text = 'A quick brown fox jumps over the lazy dog.'  
print(text.upper())     # A QUICK BROWN FOX JUMPS OVER THE LAZY DOG
```

Finding out the index of a sub-string

We can use `str.index()` method to find out the index of the sub-string. If a string contains more than one substring of same value, it returns the index of the first substring.

```
data = "My name is John."  
print(data.index('John'))    # 11
```

The above code finds out the index from where the sub-string `John` starts from.

```
data = 'He is John. John is a programmer.'  
print(data.index('John'))    # 6  
print(data.index('John', 8)) # 12
```