Topic 3.2: Python String

Python treats all user input as a String input (even when the user inputs a number), so the students should learn how to handle Strings, including how many characters form a String. A lot of String functions will be introduced.

The learners will be learning the following things in this topic:

- Python string
- Built-in functions in Python
- Length of a string
- Examples of string functions
- GrovePi kit for buttons and buzzers

WHAT IS A STRING

A string is a sequence of characters, or text in English language.

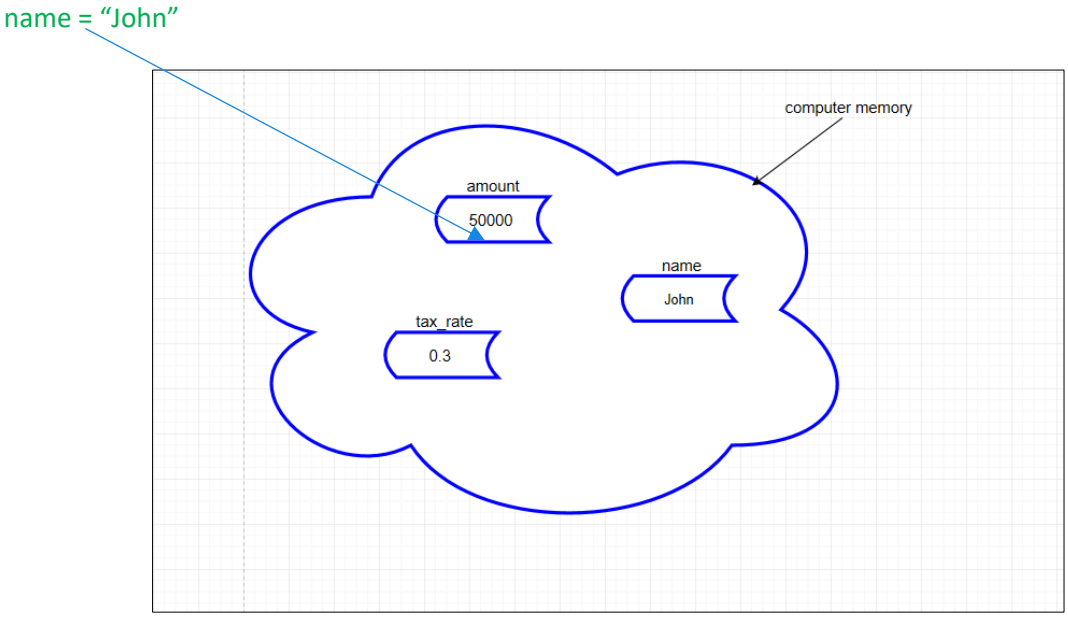
Computer uses number 0 and 1 instead of using characters even though you may see characters on your screen.

To convert a character to a number is called encoding, and reverse process is called decoding.

In Python, a String is a sequence of Unicode characters. Unicode was introduced to include every character in all languages and bring uniformity in encoding.

CREATE A STRING

A string must be “wrapped” in a pair of single or double quotation marks, for example



HOW TO ACCESS CHARACTERS IN A STRING

text = “HELLO WORLD” Here, text is a String and the value has been set to “HELLO WORLD”. When a String is created, an index number is automatically assigned to each character. The index number of the first character is **0,** the table below shows the index number of each character.

H	E	L	L	O		W	O	R	L	D
0	1	2	3	4	5	6	7	8	9	10
-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1

The first character can be presented by **text[0]**

text[5] is a space in the string above

The last character is **text[10]** or **text[-1]**

text[1:5] is a sub-string ‘ELLO’

text[5:-2] is a sub-string ‘ WOR’

STRING OPERATORS

str1 = 'Hello'

str2 ='World!'

```
# using + and , (this is used to connect text and variables)

print('str1 + str2 = ', str1 + str2)

# using *

print('str1 * 3 =', str1 * 3)
```

Output:

```
str1 + str2 =  HelloWorld!

str1 * 3 = HelloHelloHello
```

BUILT-IN STRING FUNCTIONSIN PYTHON

len(): An inbuilt function that returns the **length** of a **string**

```
my_str = 'Hello World‘
stringLength = len(my_str)
print(stringLength)
```

Output:

11

capitalize(): Capitalizes first letter of string

```
#String function example 1
my_str = 'this is a sentence'
#change the first letter to capital
my_str = my_str.capitalize()
print (my_str)
```

Output

This is a sentence

count(): Counts how many times my_str occurs in string or in a substring of string if starting index and ending index are given.

```
#String function example 2
my_str = 'this is a sentence'
sub = 'en'
endNumber = len(my_str)
howmanytimes = my_str.count(sub, 0, endNumber)
print (sub , "has been appear " , howmanytimes , " times")
```

Output

en has been appear 2 times

find(): It determines if string str occurs in string, or in a substring of string if starting index and ending index are given.

```
#String function example 3
my_str = 'Bing, Linda, Joe'
sub = 'Linda'
endNumber = len(my_str)
indexNumber= my_str.find(sub, 0, endNumber)
print (sub , " starts at index " , indexNumber)
```

Output

Linda starts at index 6

istitle(): Check the first character is capital or not

```
#String function example 4
str1 = "bing123"
str2 = "Bing123"
print (str1.istitle())
print (str2.istitle())
```

Output

false

true

isalpha(): checks whether the string consists of alphabetic characters **ONLY**

isdigit(): checks whether the string consists of numeric **ONLY**

```
#String function example 5
str1 = "this"; # No space & digit in this string
print (str1.isalpha())
str2 = “Hello World!";
print (str2.isalpha())
str3 = "12345";
print (str3.isalpha())
str4 = "12345";
print (str4.isdigit())
```

Output

True

False

False

True

RESOURCE ON MOODLE:

- Python Strings (ppt)

CLASS FILES

- The teacher will upload the class files onto Moodle

LINKS FOR STUDENTS

- https://www.w3schools.com/python/python_strings.asp
- https://www.youtube.com/watch?v=Ctqi5Y4X-jA