# STRING MANIPULATION

Strings are characters enclosed in quotes of any type—single quotation marks(‘ ‘),double quotation marks(“ “) and triple quotation marks(‘’’ ‘’’ “”” “”””)

OR

String is a sequence of characters,which is enclosed between either single (' ') or double quotes (" "), python treats both single and double quotes same.

## Triple Quotes- basically used in function to show the description related to the function

It is used to create string with multiple lines.

e.g.

**Str1 = “””This course will introduce the learner to text  mining and text manipulation basics.**
**The course begins  with an understanding of how text is handled by python”””**

## Features of String Data Type:

1. It is used to store text type of data.
2. Strings are immutable( no change of value in place)
3. Empty string has zero characters.
4. In string each character has a unique position id/index.

**Syntax to declare empty string:**

**variable _name= quotation marks**

**example:**

**str=‘ ‘**

**OR**

**str=“ “**

# Access values from a string

String items can be accessed using its index position.

e.g.

s =“who”

print(“positive indexing”)

- print(s[0]) #w
- print(s[1]) #h
- print(s[2]) #o

print('Negative indexing')

- print(s[-1]) #o
- print(s[-2]) #h
- print(s[-3]) #w

# Slicing in String

To extract limited information from a **string** .

Or

To access a range of characters in a **string**

**syntax :** **string_name[ : : ]**

**string_name[start:stop :step]**

# Iterating/Traversing through string

**Each character of the string can be accessed sequentially using for loop.**

**e.g**

```
str='Computer Sciene‘
for i in str:
    print(i)
```

**OR**

```
str='Computer Sciene‘
for i in range(len(str)):
    print(str[i])
```

**OUTPUT**

C
o
m
p
u
t
e
r

S
c
i
e
n
c
e

# Write a code to display the character and its position

**e.g**

```
str='COMPUTER SCIENCE'
for i in range(len(str)):
    print(i , str[i])
```

**OUTPUT**

```
0 C
1 O
2 M
3 P
4 U
5 T
6 E
7 R
8
9 S
10 C
11 I
12 E
13 N
14 C
15 E
```

## String comparison

**We can use ( > , ==,< , <= , <=, != ) to compare two strings.**

**String compares lexicographically it means using ASCII value of the characters.**

**Suppose you have str1 as "Reena" and str2 as "Reeta" .**
**The first two characters from str1 and str2 ( R and R ) are compared.**
**As they are equal,**
**the second and third characters are compared.**
**they are also equal,**
**the fourth two characters ( n and t ) are compared. And because 't' has greater ASCII value than 'n' , str2 is greater than str1 .**

```
print(" Reena " == " Reeta ")
print(" Reena " != " Reeta ")
print(" Reena " > " Reeta ")
print(" Reena " >= " Reeta ")
print(" Reena " < " Reeta ")
print(" Reena " <= " Reeta ")
print(" Reena " > "")
```

**ord() is used to find the ordinal Unicode (ASCII) value.**

syntax

ord('single character')

e.g.

ord('A')

## Updating Strings- String are immutable but

String value can be updated by reassigning another value in it.(by using concatenation operator (+))

e.g.

```
a = 'Hello World'
a = a[:7] + ' with file'
print ("updated string :- ",a )
```

OUTPUT

```
('updated string :- ', Hello with file')
```

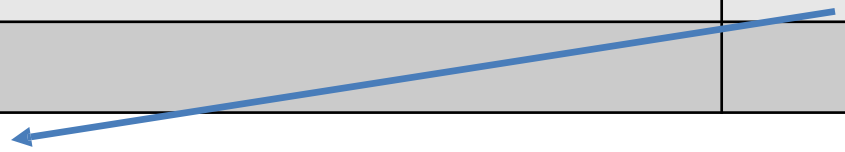
# String Special Basic Operators

e.g.

a="comp"

b="sc"

| Operator | Description | Example |
|---|---|---|
| + | Concatenation – to add two strings | a + b = compsc |
| * | Replicate same string multiple times (Replication) | a*2 = compcomp |
| [] | Character of the string (**position id/index)** | a[1] will give o |
| [ : ] | **Slice** –Range string | a[1:4] will give omp |
| in | Membership operator check | p in a will give True |
| not in | Membership check for non availability | M not in a will give False |
| % | Format the string **(placeholder)** | |



print ("my file name is %s and location is  %d" % ('story', 10))

# String functions and methods

a="comp"

b="my comp"

| Method | Result | Example |
|---|---|---|
| len() | Returns the length of the string | r=len(a) will be 4 |
| str.capitalize() | To capitalize the string | r=a.capitalize() will be "Comp" |
| str.title() | Will return title case string | r=b.title() will be "My Comp" |
| str.upper() | Will return string in upper case | r=a.upper() will be "COMP" |
| str.lower() | Will return string in lower case | r=a.upper() will be "comp" |
| str.count() | will return the total count of a given element in a string | r=a.count('o') will be 1 |
| str.find(sub) | To find the substring position(starts from 0 index) | r=a.find ('m') will be 2 |
| str.replace() | Return the string with replaced sub strings | r=b.replace('my','your') will be 'your comp' |

# String functions and methods

a="comp"

| Method | Result | Example |
|---|---|---|
| str.index() | Returns index position of substring | r=a.index('om') will be 1 |
| str.isalnum() | String consists of only alphanumeric characters (no symbols no spaces) | r=a.isalnum() will return True |
| str.isalpha() | String consists of only alphabetic characters (no symbols no spaces) | |
| str.islower() | String's alphabetic characters are all lower case | |
| str.isnumeric() | String consists of only numeric characters | |
| str.isspace() | String consists of only whitespace characters | |
| str.istitle() | String is in title case | |
| str.isupper() | String's alphabetic characters are all upper case | |

# String functions and methods

| Method | Result | Example |
|---|---|---|
| str.lstrip(char)<br>str.rstrip(char) | Returns a copy of the string with leading/trailing characters removed | b=‘ comp’;<br>r=b.lstrip() will be ‘comp’ |
| str.strip(char) | Removes specific character from leading and trailing position | b=‘ comp ’;<br>b.strip() …output will be ‘comp’ |

More examples related to strip function

```
>>> a='this is my file'
>>> a.strip('t')
'his is my file'
>>> a='coronovirus disease'
>>> a.strip('covid')
'ronovirus disease'
>>> a.strip('sea')
'coronovirus di'
```

# String functions and methods

| Method | Result | Example |
|---|---|---|
| str.split() | Returns list of strings as splitted | b='my comp'; r=b.split() will be ['my','comp'] |
| | | More examples<br>>>> a='this is my file'<br>>>> a.split('i',2)<br>['th', 's ', 's my file']<br>>>> a='Internationnal'<br>>>> a.split('n')<br>['I', 'ter', '', 'atio', '', 'al']<br>>>> a.split('n',3)<br>['I', 'ter', '', 'ationnal'] |
| str.partition() | Partition the string on first occurrence of substring | b='my comp';<br>r=b.partition('comp')<br>Output will be ['my','comp']<br>More examples<br>>>> a='this is my file'<br>>>> a.partition('i')<br>('th', 'i', 's is my file')<br>>>> a='Internationnal'<br>>>> a.partition('i')<br>('Internnat', 'i', 'onnal')<br>>>> a.partition('n')<br>('I', 'n', 'ternnationnal') |

# String functions and methods

| Method | Result | Example |
|---|---|---|
| endswith(s1: str): bool | Returns True if strings ends with substring s1 | |
| startswith(s1: str): bool | Returns True if strings starts with substring s1 | |
| count(substring): int | Returns number of occurrences of substring the string | |
| find(s1): int | Returns index from where s1 starts in the string, if string not found returns -1 | |
| index: int | Returns highest index from where s1 starts in the string, if string not found returns value error | Stringname.index(char)<br>e.g.<br>>>> a='this is my file'<br>>>> a.index('i')<br>2<br>>>> a.index('i',3)<br>5<br>>>> a.index('i',6,11)<br>Traceback (most recent call last):<br>File "<pyshell#19>", line 1, in <module><br>a.index('i',6,11)<br>ValueError: substring not found |

# Searching for Substrings

E.g. program

```
s = "welcome to python"
print(s.endswith("thon"))
print(s.startswith("good"))
print(s.find("come"))
print(s.find("become"))
print(s.rfind("o"))
print(s.count("o"))
```

OUTPUT

```
True
False
3
-1
15
3
```

## # Program to calculate the number of digits

```
string=input("Enter string:")
c=0
for i in string:
    if(i.isdigit()):  # or   if i>='0' and i<='9':
        c=c+1
print("The number of digits is:", c)
```

# Format Symbol

| |
|---|
| %s -string conversion via str() prior to formatting |
| %i -signed decimal integer |
| %d -signed decimal integer |
| %u -unsigned decimal integer |
| %o -octal integer |
| %x -hexadecimal integer (lowercase letters) |
| %X -hexadecimal integer (UPPERcase letters) |
| %e -exponential notation (with lowercase 'e') |
| %E -exponential notation (with UPPERcase 'E') |
| %f -floating point real number |
| %c -character |
| %G -the shorter of %f and %E |