



**Department of Computer Science and Engineering
PES University, Bangalore, India**

**Lecture Notes
Python for Computational Problem Solving
UE23CS151A**

***Lecture #42
String and it's Operations***

**By,
Prof. Sindhu R Pai,
Anchor, PCPS - 2023
Assistant Professor
Dept. of CSE, PESU**

**Verified by,
PCPS Team - 2023**

**Many Thanks to
Dr. Shylaja S S (Director, CCBD and CDSAML Research Centers, Former
Chairperson, CSE, PES University)
Prof. Chitra G M (Asst. Prof, Dept. of CSE, PCPS Anchor – 2022)**

Functions/Methods of Strings in Python

As string is immutable, applying any function on it always returns a new string or returns a Boolean value.

Specific functions of Strings:

Use `dir()` function to **display the list of functions a type supports**. Can use `help()` on any of these to know its job and its usage. Sample is shown below.

```
>>> dir(str)
['_add_', '__class__', '__contains__', '__delattr__', '__dir__', '__doc__', '__eq__', '__format__',
'_ge_', '__getattr__', '__getitem__', '__getnewargs__', '__getstate__', '__gt__', '__hash__',
'_init_', '__init_subclass__', '__iter__', '__le_', '__len__', '__lt__', '__mod__', '__mul__', '__ne
_', '__new__', '__reduce__', '__reduce_ex__', '__repr__', '__rmod__', '__rmul__', '__setattr__', '__s
izeof__', '__str__', '__subclasshook__', 'capitalize', 'casefold', 'center', 'count', 'encode', 'endsw
ith', 'expandtabs', 'find', 'format', 'format_map', 'index', 'isalnum', 'isalpha', 'isascii', 'isdecim
al', 'isdigit', 'isidentifier', 'islower', 'isnumeric', 'isprintable', 'isspace', 'istitle', 'isupper',
'join', 'ljust', 'lower', 'lstrip', 'maketrans', 'partition', 'removeprefix', 'removesuffix', 'repla
ce', 'rfind', 'rindex', 'rjust', 'rpartition', 'rsplit', 'rstrip', 'split', 'splitlines', 'startswith',
'strip', 'swapcase', 'title', 'translate', 'upper', 'zfill']
>>>
```

```
>>> help(str.capitalize)
Help on method_descriptor:

capitalize(self, /)
    Return a capitalized version of the string.

    More specifically, make the first character have upper case and the rest lower
    case.
>>> █
```

capitalize(): Returns a new string in which the first character will be upper case and all others will be in lowercase.

```
>>> s1 = "python ProgramMing class is from 2nd Sep, 2023"
>>> s2 = s1.capitalize()
>>> s1
'python ProgramMing class is from 2nd Sep, 2023'
>>> s2
'Python programming class is from 2nd sep, 2023'
>>>
```

title(): Returns a version of the string in which words start with uppercased characters and all remaining cased characters have lower case.

```
>>> s1
'python ProgramMing class is from 2nd Sep, 2023'
>>> s2 = s1.title()
>>> s2
'Python Programming Class Is From 2Nd Sep, 2023'
>>> s1
```

'python ProgramMing class is from 2nd Sep, 2023'

upper() and lower(): Returns a string in all uppercase and in all lower case respectively.

```
>>> s1
'python ProgramMing class is from 2nd Sep, 2023'
>>> s2 = s1.upper()
>>> s3 = s1.lower()
>>> s2
'PYTHON PROGRAMMING CLASS IS FROM 2ND SEP, 2023'
>>> s3
'python programming class is from 2nd sep, 2023'
>>>
```

swapcase(): Convert uppercase characters to lowercase and lowercase characters to uppercase and returns a new string.

```
>>> s1
'python ProgramMing class is from 2nd Sep, 2023'
>>> s2 = s1.swapcase()
>>> s2
'PYTHON pROGRAMmING CLASS IS FROM 2ND sEP, 2023'
>>> s1
'python ProgramMing class is from 2nd Sep, 2023'
>>>
```

isupper() and islower(): Returns a Boolean value based on whether all the cased characters in the string are in upper case or all in lower case respectively.

>>> s1 = "pyth on"	s3 = "python 123"
>>> s1.upper()	>>> s3.islower()
'PYTH ON'	True
>>> s1.isupper()	>>> s4 = "pYThon 123"
False	>>> s4.islower()
>>> s1.islower()	False
True	>>> s4.isupper()
>>> s2 = "PY THON"	False
>>> s2.isupper()	>>>
True	
>>> s2.islower()	
False	
>>>	

isdigit(): Returns True if all the characters in str are digits. Else returns False.

```
>>> s3
'python 123'
>>> s3.isdigit()
False
>>> s4 = "92345"
>>> s4.isdigit()
True
>>> s5 = "92 345"
>>> s5.isdigit()
False
>>>
```

isalpha(): Returns True if all characters in str are alphabetic, Else returns False.

```
>>> s1
'pyth on'
>>> s1.isalpha()
False
>>> s2 = "pythON"
>>> s2.isalpha()
True
>>> s3 = 'python123'
>>> s3.isalpha()
False
>>> s3 = 'python on'
>>> s3.isalpha()
False
>>>
```

isalnum(): Returns True if the string is an alpha-numeric string, False otherwise. A string is alpha-numeric if all characters in the string are either alphabets or numeric values.

```
>>> s1
'pyth on'
>>> s1.isalnum()
False
>>> s2 = 'python'
>>> s2.isalnum()
True
>>> s3 = "python123"
>>> s3.isalnum()
True
>>>
>>> s4 = "123"
>>> s4.alnum()
True
>>> s4 = "123 "
>>> s4.isalnum()
False
>>>
```

strip(): Returns a copy of the string with leading and trailing whitespace removed. Very useful when you are reading the data from the file using functions.

```
>>> s1 = "I love python      " #2 tabs were given at the end
>>> len(s1)
15
>>> s2 = s1.strip()
>>> s2
'I love python'
>>> len(s2)
13
>>>
Try variations of it - > lstrip() and rstrip()
```

split(): Returns a list of the substrings in the string, using white space as the delimiter.

White space character includes `\n` `\r` `\t` `\f` and spaces.

```
>>> s1 = "here is an example for splitting the given string"
>>> s1.split()
['here', 'is', 'an', 'example', 'for', 'splitting', 'the', 'given', 'string']
>>> s1
'here is an example for splitting the given string'
>>> s1.split("p") # can you pass "\n"?
['here is an exam', 'le for s', 'litting the given string']
>>>
```

splitlines(): Returns a list of lines in the string, breaking at line boundaries.

```
>>> s1 = """here is an
... example for
... splittling"""
>>> s1
'here is an\nexample for\nsplittling'
>>> s1.splitlines()
['here is an', 'example for', 'splittling']
>>> s1
'here is an\nexample for\nsplittling'
>>>
```

join(): This function can take any iterable which has string elements. Concatenates the string elements from the iterable with the string with which the function join is called as shown here - > Example: `'.'.join(['ab', 'pq', 'rs'])` -> `'ab.pq.rs'`

```
>>> s1 = {'1','3','2','8'}
>>> s1
{'8', '1', '3', '2'}
>>> "abc".join(s1)
'8abc1abc3abc2'
>>> "abc".join("pqr")
'pabcqabcr'
>>> ".join(["sindhu","r","pai"])
'sindhu r pai'
>>>
```

startswith() and endswith(): Return True if string starts/ends with the specified prefix in the argument, False otherwise

```
>>> s1 = "great job"
>>> s1.startswith("g")
True
>>> s1.startswith("G")
False
>>> s1.startswith(s1[0].upper())
False
>>> s1.endswith("b")
True
>>> s1.endswith("ob")
True
>>> s1.endswith("jb")
False
>>>
```

Few points to think!

- Can you convert the string to lowercase and assign it to the same variable?
- How do you split the given string into exactly 4 words?
- If you pass the dictionary to join function, how does it handle concatenation?
- Once you read all the data from the file, how will you find out the number of characters in each line?
- Think about copying only the numbers from one string to another.
- Try these functions - >find, rfind, count, index

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