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isupper(), islower(), lower(), upper() in Python and their applications

isupper()

In Python, isupper() is a built-in method used for string handling.

The isupper() methods returns "True" if all characters in the string are uppercase, Otherwise, It returns "False".

This function is used to check if the argument contains any uppercase characters such as :

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

Syntax :

```
string.isupper()
Parameters:
isupper() does not take any parameters
Returns :
1.True- If all characters in the string are uppercase.
2.False- If the string contains 1 or more non-uppercase characters.
```

Examples:

```
Input : string = 'GEEKSFORGEEKS'
Output : True

Input : string = 'GeeksforGeeks'
Output : False
```

Errors And Exceptions

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1. It returns "True" for whitespaces
2. It does not take any arguments, Therefore, It returns an error if a parameter is passed.
3. Digits and symbols return "True", Only an uppercase letter returns "false".

```python
# Python code for implementation of isupper()

# checking for uppercase characters
string = 'GEEKSFORGEEKS'
print(string.isupper())

string = 'GeeksforGeeks'
print(string.isupper())
```

Run on IDE

Output:

```
True
False
```

islower()

In Python, islower() is a built-in method used for string handling.

The islower() methods returns "True" if all characters in the string are lowercase, Otherwise, It returns "False".

This function is used to check if the argument contains any lowercase characters such as :

```
abcdefghijklmnopqrstuvwxyz
```

Syntax :

```
string.islower()
Parameters:
islower() does not take any parameters
Returns :
1.True- If all characters in the string are lower.
2.False- If the string contains 1 or more non-lowercase characters.
```

Examples:

```
Input : string = 'geeksforgeeks'
Output : True


Input : string = 'GeeksforGeeks'
Output : False
```

Errors And Exceptions

1. It returns "True" for whitespaces
2. It does not take any arguments, Therefore, It returns an error if a parameter is passed.
3. Digits and symbols return "True", Only a lowercase letter returns "false".

```python
# Python code for implementation of isupper()

# checking for lowercase characters
string = 'geeksforgeeks'
print(string.islower())

string = 'GeeksforGeeks'
print(string.islower())
```

Run on IDE

Output:

```
True
False
```

lower()

In Python, lower() is a built-in method used for string handling.
The lower() methods returns the lowercased string from the given string. It converts all uppercase characters to lowercase. If no uppercase characters exist, it returns the original string.

Syntax :

```
string.lower()
Parameters:
lower() does not take any parameters
Returns :
It converts the given string in into lowercase and returns the string.
```

Examples:

```
Input : string = 'GEEKSFORGEEKS'
Output : geeksforgeeks

Input : string = 'GeeksforGeeks'
Output : geeksforgeeks
```

Errors And Exceptions

1. It does not take any arguments, Therefore, It returns an error if a parameter is passed.

2. Digits and symbols return are returned as it is, Only an uppercase letter is returned after converting to lowercase.

```python
# Python code for implementation of lower()

# Checking for lowercase characters
string = 'GEEKSFORGEEKS'
print(string.lower())

string = 'GeeksforGeeks'
print(string.lower())
```

Run on IDE

Output:

```
geeksforgeeks
geeksforgeeks
```

upper()

In Python, upper() is a built-in method used for string handling.

The upper() methods returns the uppercased string from the given string. It converts all lowercase characters to uppercase.If no lowercase characters exist, it returns the original string.

Syntax :

```
string.upper()
Parameters:
upper() does not take any parameters
Returns :
It converts the given string in into uppercase and returns the string.
```

Examples:

```
Input : string = 'geeksforgeeks'
Output : GEEKSFORGEEKS

Input : string = 'My name is ayush'
Output : MY NAME IS AYUSH
```

Errors And Exceptions

1. It does not take any arguments, Therefore, It returns an error if a parameter is passed.

2. Digits and symbols return are returned as it is, Only a lowercase letter is returned after converting to uppercase.

```python
# Python code for implementation of upper()

# checking for uppercase characters
string = 'geeksforgeeks'
print(string.upper())

string = 'My name is ayush'
print(string.upper())
```

Run on IDE

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Output:

```
GEEKSFORGEEKS
MY NAME IS AYUSH
```

Application : Given a string in python, count number of uppercase letters, lowercase letters and spaces in a string and toggle case the given string (convert lowercase to uppercase and vice versa).

Examples:

```
Input : string = 'GeeksforGeeks is a computer Science portal for Geeks'
Output : Uppercase - 4
         Lowercase - 41
         spaces - 7
         gEEKSFORGEEKS IS A COMPUTER sCIENCE PORTAL FOR gEEKS

Input : string = 'My name is Ayush'
Output : Uppercase - 2
         Lowercase - 11
         spaces - 3
         mY NAME IS aYUSH
```

Algorithm

1. Traverse the given string character by character upto its length, check if character is in lowercase or uppercase using built in methods.

2. If lowercase, increment its respective counter, convert it to uppercase using upper() function and add it to a new string, if uppercase, increment its respective counter, convert it to lowercase using lower() function and add it to the new string.

3. If space, increment its respective counter and add it to a new string

4. Print the new string.

```python
# Python code for implementation of upper()
# Given string and new string

string ='GeeksforGeeks is a computer Science portal for Geeks'
newstring =''
count1 = 0
count2 = 0
count3 = 0

for a in string:
# Checking for lowercase letter and converting to uppercase.
    if (a.isupper()) == True:
        count1+= 1
        newstring+=(a.lower())
# Checking for uppercase letter and converting to lowercase.
    elif (a.islower()) == True:
        count2+= 1
        newstring+=(a.upper())
# Checking for whitespace letter and adding it to the new string as it is.
    elif (a.isspace()) == True:
        count3+= 1
        newstring+= a
print("In original String : ")
print("Uppercase -", count1)
print("Lowercase -", count2)
```

```python
print("Spaces -", count3)

print("After changing cases:")
print(newstring)
```

Run on IDE

Output:

```
In original String :
Uppercase - 4
Lowercase - 41
Spaces - 7
After changing cases:
gEEKSFORgEEKS IS A COMPUTER sCIENCE PORTAL FOR gEEKS
```

AyushSaxena
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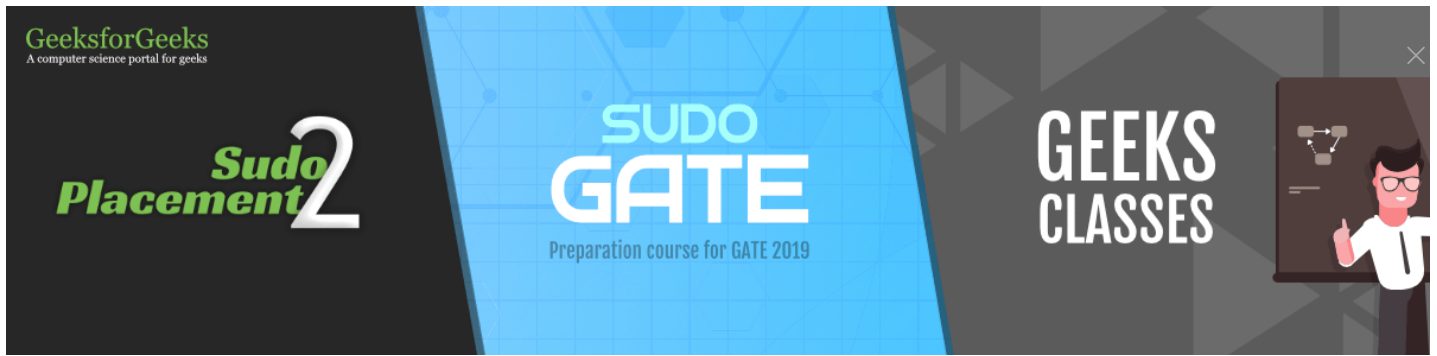
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