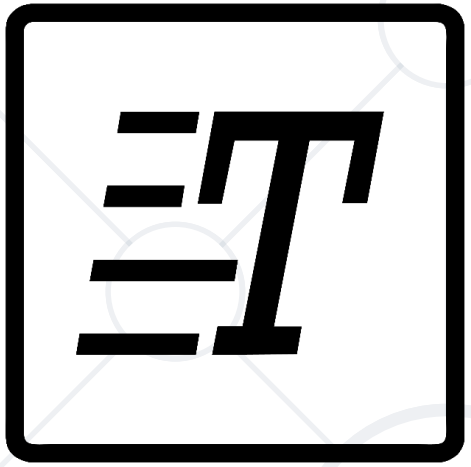
Text Processing



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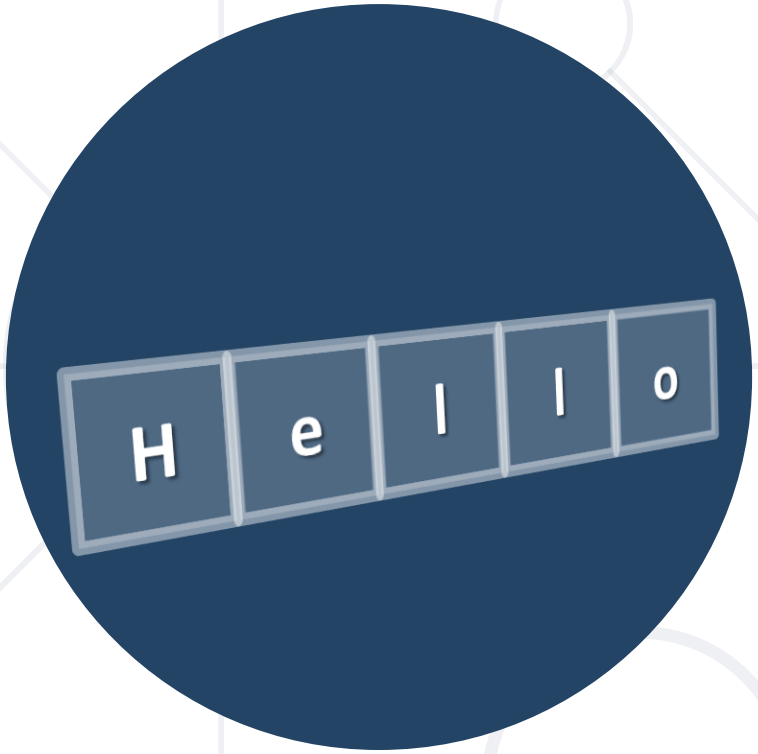


String Definition

What is a String?

- A string is a **sequence** of characters
- A character is simply a **symbol**
- Computers do not deal with characters, they deal with **numbers**
- A character is stored and manipulated as a combination of **0's** and **1's**
- In Python, a string is a sequence of **Unicode** characters

String Literals

- String literals are surrounded by either **single quotation** marks, or **double quotation** marks
- '**hello**' is the same as "**hello**"
- You can display a string literal with the **print()** function

```
print("Hello")
print('Hello')
```

Assign String to a Value

- Assigning a string to a variable is done with the variable **name** followed by an **equal sign** and the **string**

```
a = "Hello"
print(a)
```

- Assign a **multiline** string to a variable by using **three quotes**

```
a = """Lorem ipsum dolor sit amet,consectetur adipiscing
elit, sed do eiusmod tempor incididuntut labore et
dolore magna aliqua."""
print(a)
```

Methods str() and split()

- The `str()` function converts the specified value into a string

```
x = str(3.5)
print(x) # "3.5"
```

- The `split()` method splits a string into a list

```
txt = "hello, my name is Peter, I am 26 years old"
lst = txt.split(", ")
print(lst)
# ["hello", "my name is Peter", "I am 26 years old"]
```

Problem: Reverse Strings

- You will be given a series of strings until you receive an "**end**" command
- Print each pair on separate line in format "**{word} = {reversed word}**"

```
helLo
Softuni
bottle
end
```

```
helLo = oLleh
Softuni = inutfoS
bottle = elttob
```

Solution: Reverse Strings

```
text = input()
while text != "end":
    text_reversed = ""
    for ch in reversed(text):
        text_reversed += ch
    print(text + " = " + text_reversed)
    text = input()
```

String Manipulation

Concatenation

- Use the "+" operator to merge strings

```
str1 = "Hello"
str2 = "World"
str3 = str1 + str2
# HelloWorld
```

- The "*" operator repeats the string

```
str1 = "red"
print(str1 * 3)
# redredred
```

String Formatting

- Formatting with the "%" operator

```
x = 'apples'
y = 'lemons'
z = "In the basket are %s and %s" % (x, y)
```

- Formatting with the "{}" operators

```
x = 'apples'
y = 'lemons'
z = "In the basket are {} and {}".format(x, y)
```

Formatting with F-String

- Python 3 introduced a new and simple way for string formatting called **"f-String"**
- Since Python 3 came out, it is the most used way for string formatting

```
x = 'apples'
y = 'lemons'
z = f"In the basket are {x} and {y}"
# In the basket are apples and lemons
```

Substring

- Python offers many ways to substring a string
- It is often called **"slicing"**
- Slicing can also be used with **lists**
- It is equivalent to the **`slice()`** method

```
text = "My name is Peter"
name = text[-5:]
# same as text[11:] or text[slice(-5, 16, 1)]
```

Problem: Repeat Strings

- Write a program that reads an array of strings
- Each string is repeated **N** times, where N is the **length** of the string
- Print the concatenated string

```
hi abc add
```

```
hihiabcabcabcaddaddadd
```

Solution: Repeat Strings

```
strings = input().split(" ")
result = ""
for word in strings:
    length = len(word)
    result += word * length
print(result)
```

String Methods

String Methods

- Check if a character is a digit: **`isdigit()`**

```
'1'.isdigit() # True
'p'.isdigit() # False
```

- Check if a character is upper/lower case: **`isupper()`** and **`islower()`**

```
'P'.isupper() # True
'P'.islower() # False
'u'.islower() # True
```

String Methods

- Convert to upper/lower case: **`upper()`** and **`lower()`**

```
"hello".upper() # "HELLO"
"HeLLo".lower() # "hello"
```

- Remove white spaces at start/end or both: **`strip()`**, **`rstrip()`**, **`lstrip()`**

```
" hello ".lstrip() # "hello "
" hello ".rstrip() # " hello"
" hello ".strip()  # "hello"
```

String Methods

- You can use the **`replace()`** method to replace all occurrences of a specified phrase with another specified phrase

```
txt = "I like bananas"
print(txt.replace("bananas", "apples")) # I like apples
```

- If you only want to replace a certain number of phrases, add a **count**

```
txt = "I like bananas bananas bananas"
x = txt.replace("bananas", "apples", 2)
print(x)
```

Problem: Substring

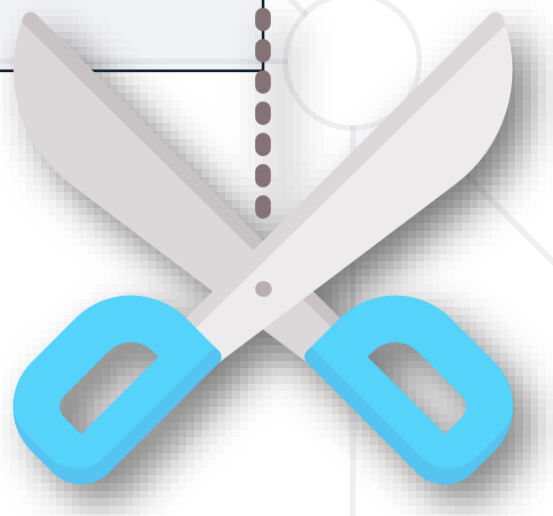
- You will receive **two strings**
- Write a program that removes all of the **occurrences of** the **first** string **in the second** until there is no match
- At the end print the **remaining** string

```
ice
kicegiciceeb
```

```
kgb
```

Solution: Substring

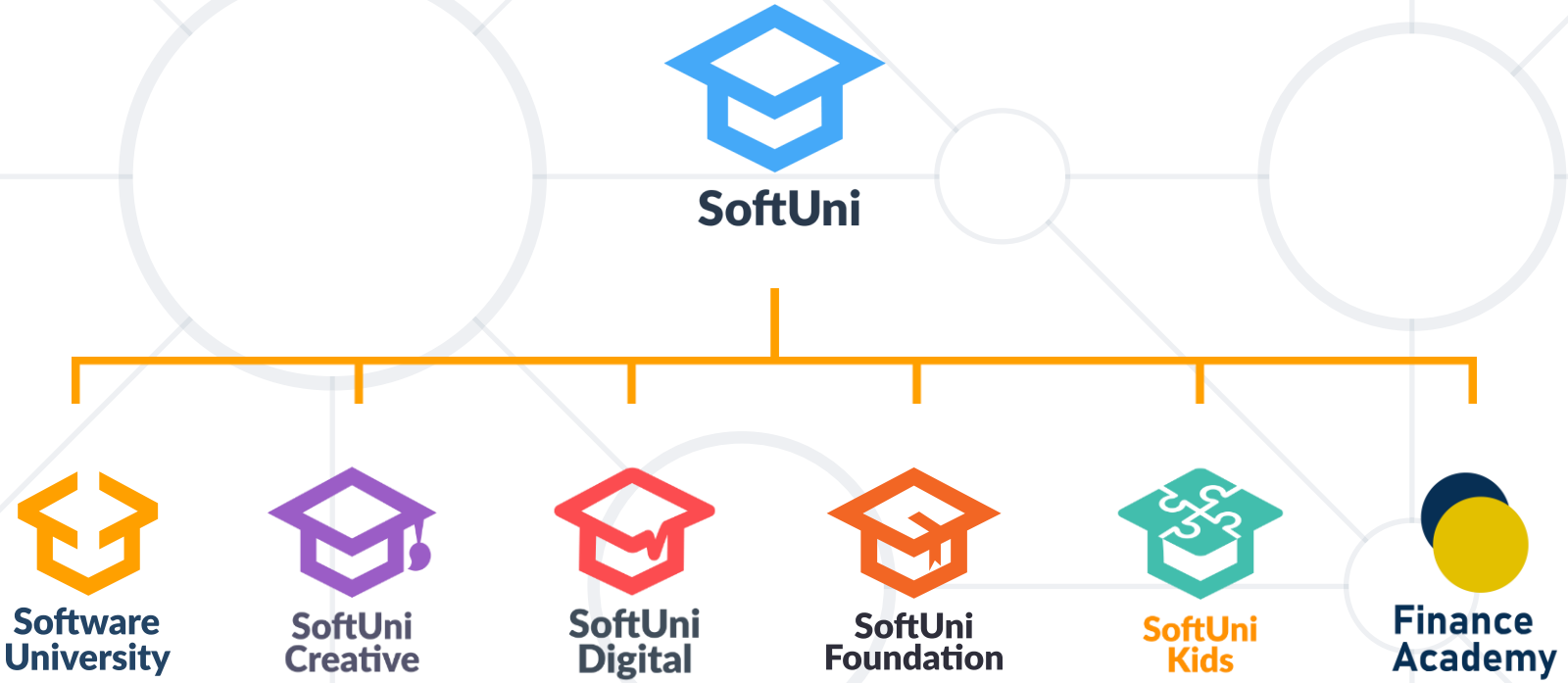
```
first = input()
second = input()
while first in second:
    second = second.replace(first, "")
print(second)
```



Summary

- A string is a **sequence** of characters
- A character is simply a **symbol**
- We can use "**+**" operator to merge strings
- We can use "*****" operator to repeat strings
- There are many methods we can use to manipulate strings: **upper()**, **lower()**, **split()**, etc.

Questions?



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