Practice work 5 - Working with Strings in Python

Objective: learn how to work with strings.

The student must:

Own:

Skills in drawing up linear algorithms in the Python programming language using string data;

Be able to:

Apply string functions and methods when processing string data;

Know:

Operations and methods for processing strings.

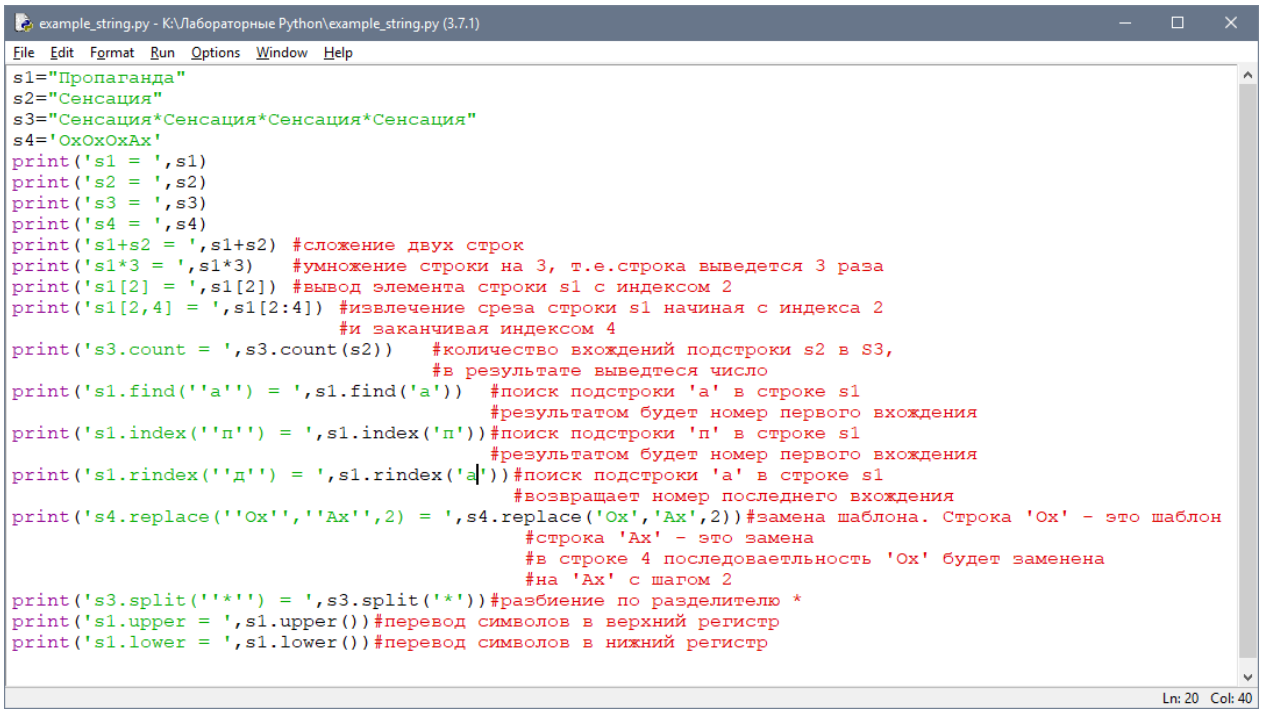
String - the base type, which is an immutable sequence of characters; str from "string" - "string".

String Functions and Methods

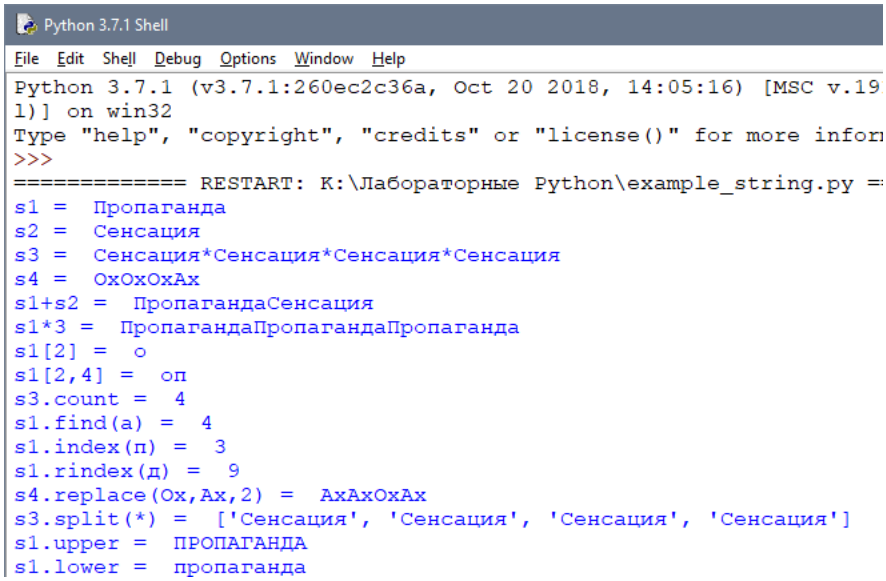
function or method	**Purpose**
S1+S2	Concatenation (string addition)
S1*3	Line repetition
S[i]	Referencing by index
S[i:j:step]	Slice extraction
len(S)	Line length
S.join(list)	Joining strings from sequence str via delimiter given by string
S1.count(S[, i, j])	the number of occurrences of the substring s in the string s1. The result is a number. You can specify the position of the start of the search i and the end of the search j
S.find(str, [start],[end])	Search for a substring in a string. Returns the number of the first occurrence, or -1
S.index(str, [start],[end])	Search for a substring in a string. Returns the number of the first occurrence or raises a ValueError
S.rindex(str, [start],[end])	Search for a substring in a string. Returns the number of the last occurrence or raises a ValueError
S.replace(sample,replacement)	Template Replacement
S.split(symbol)	Splitting a string by delimiter

S.upper()	Convert string to upper case
S.lower()	Convert string to lower case

The following is a program that demonstrates the use of string manipulation functions and methods.



Python Program Example



The result of executing a program using functions and methods for working with string

Example

Task 0

Check if the string will be read the same way from right to left and from left to right (i.e., is it a palindrome).

Solution

First, enter a string with the command: s=input('Enter a string ').

Then we define the boolean variable flag and assign the value 1 to it: flag=1.

First, you need to remove the spaces in the entered string. To do this, we use the cyclic for construct, which will be executed as many times as the length of the string. The length of the string is determined by the function len(s).

In the loop body, we will check the following condition: s[i]!=' '. This logical expression will be true if the i-th element of the string is not equal to a space, then the command following after the colon will be executed: string+=s[i].

To the term string, which was declared at the beginning of the program, the string s will be added character by character, but without spaces.

To test a string for "palindrome", we use the cyclic for construct.

The length of half of the string is found by dividing by 2. If the number of characters is odd, then the one in the middle is not taken into account, because his compared pair is himself.

The number of iterations of the loop is equal to the length of half the string. The length of the string is determined by the function len(s), where the argument is the string we entered s. Knowing the length of the string, you can calculate the number of repetitions of the loop. To do this, we divide the length of the string by 2 as an integer: len(s)//2.

To set the range for the loop, use the range() function, in which the argument will be half the length of the string: range(len(s//2)).

for i in range(len(s//2)).

If the character at index i is not equal to the "symmetric" character from the end of the string (which is found by indexing from the end)

if s[i] != s[-1-i],

then the flag variable is assigned the value 0 and the loop exits with the break command.

Further, using the if-else conditional construction, depending on the value of flag, either - 0 or -1, a message is displayed that the string is a palindrome or not.

Python Program Example

```
Введите строку
а роза упала на лапу азора
арозаупаланалапуазора
Палиндром
```

The result of the program execution

Tasks for independent work

Task 1

Given a string containing Russian text. Find the number of words beginning with the letter "e".

Task 2

In the string, replace all colons (:) with a percent sign (%). Count the number of replacements.

Task 3

Delete the dot (.) character in the string and count the number of characters removed.

Task 4

In the string, replace the letter (a) with the letter (o). Count the number of replacements. Count how many characters are in a string.

Task 5

Change all uppercase letters to lowercase in a string.

Task 6

Delete all the letters "a" in the string and count the number of characters removed.

Task 7

Given a line. Convert it by replacing with asterisks all the letters "n" that occur among the first n/2 characters. Here n is the length of the string.

Task 8

Given a string that ends with a dot. Count how many words are in a line.

Task 9

Determine how many times the given word occurs in the text.

Task 10

The sentence string is given in English. Convert the string so that each word starts with a capital letter.

Task 11

Given a line. Count the longest sequence of consecutive letters "n". Convert it by replacing all exclamation points with dots.

Task 12

Given a line. Print all words ending with the letter "I".

Task 13

Given a string of characters, among which there is one opening and one closing brackets. Display all the characters inside those brackets.

Task 14

Given a line. Print all words that start with the letter "a" and words that end with the letter "i".

Task 15

Given a line of text. Count the number of "t"s in the string.