WORKING WITH MATHEMATICAL FUNCTIONS IN THE PYTHON PROGRAMMING LANGUAGE

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Abstract. Python programming language is one of the most popular programs nowadays. This article is the basis for learning its for loop. From the Python programming language to the science of modern programming languages, its use in teaching is a scientific innovation, and a methodological guide in this regard is of great importance.
Key words: Python, programming language, function, for loop, range, structure, value.
Annotatsiya. Python dasturlash tili bugungi kunda eng mashhur dasturlardan biridir. Ushbu maqola for tsiklini o'rganish uchun asosdir. Python dasturlash tillari fanidan tortib, zamonaviy dasturlash tillari fanigacha uning o'qitishda qo'llanilishi ilmiy yangilik bo'lib, bu borada uslubiy qo'llanma katta ahamiyatga ega.
Kalit so'zlar: Python, dasturlash tili, funksiya, for loop, range, struktura, qiymat.
Аннотация: Язык программирования Python — одна из самых популярных программ сегодня. Эта статья представляет собой введение в изучение цикла for. От науки о языках программирования Python до науки о современных языках программирования его использование в обучении является научной инновацией, и методическое пособие имеет в этом отношении большое значение.
Ключевые слова. Python, язык программирования, функция, цикл for, диапазон, структура, значение.

Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation.

Python is dynamically typed and garbage-collected. It supports multiple programming paradigms, including structured (particularly procedural), object-oriented and functional programming. It is often described as a "batteries included" language due to its comprehensive standard library.

The *for* loop in the Python programming language is different from the way it is used in the C and Pascal programming languages. In Python, the for statement is a bit more complicated, but it executes much faster than the *while loop*.

The for...in operator iterates over a sequence of objects, that is, this loop passes through any iterable object (through a string or a list) and executes the loop body during each pass. A *for* loop is used for iterating over a sequence (that is either a list, a tuple, a dictionary, a set, or a string).

This is less like the *for* keyword in other programming languages, and works more like an iterator method as found in other object-orientated programming languages.

With the *for* loop we can execute a set of statements, once for each item in a list, tuple, set etc.

```
letters = ["a", "b", "c"]
for x in letters:
  print(x)
```
```
a
b
c
```

The *for* loop does not require an indexing variable to set beforehand. Even strings are iterable objects, they contain a sequence of characters:

```
for x in "letters":
  print(x)
```
```
l
e
t
t
e
r
s
```

To loop through a set of code a specified number of times, we can use the range() function.

break the loop with the break keyword, even if the loop has not stopped. For example, let's start a loop to print the letters of the word "computer" one by one, and stop the loop when we reach the letter "u":

```
A = "computer"
for x in A:
    print(x)
    if x == 'u':
        break
```
```
c
o
m
p
u
```

In the code above, we placed the print command before the break command. Therefore, first the letter "u" appeared on the screen, and then the cycle stopped. Now let's put the print command below. In this case, the letter "u" will not appear on the screen, because the cycle will stop before it.

```
A = "computer"
for x in A:
    if x == 'u':
        break
    print(x)
```
```
c
o
m
p
```

The sontinue keyword jumps through some parts of the loop. In other words, at certain points during the cycle, the specified action will not be performed.

For example, let's print the letters in the word "computer" and drop the letter "t":

```
A = "computer"
for x in A:
    if x == 't':
        continue
    print(x)
```
```
c
o
m
p
u
e
r
```

The *range()* function returns a sequence of numbers, starting from 0 by default, and increments by 1 (by default), and ends at a specified number.

```
for x in range(4):
  print(x)
```

```
0
1
2
3
```

Note that range(6) is not the values of 0 to 4, but the values 0 to 3.

The range() function defaults to 0 as a starting value, however it is possible to specify the starting value by adding a parameter: range(3, 8), which means values from 3 to 8 (but not including 8):

```
for x in range(3, 8):
  print(x)
```

```
3
4
5
6
7
```

The range() function defaults to increment the sequence by 1, however it is possible to specify the increment value by adding a third parameter: range(2, 30, 3):

```
for x in range(2, 30, 3):
  print(x)
```

```
2
5
8
11
14
17
20
23
26
29
```

The *else* keyword allows the loop to complete another action. It is usually used to indicate the end of a cycle.

For example, we want to print the word "computer" five times and report the end of the loop. Now notice that with the *range()* function, we're not printing the numbers to the screen based on the count, but we're doing the same thing over and over again:

```
word='computer'
for x in range(5):
    print(word)
else:
    print('\nThe End!')
```

```
computer
computer
computer
computer
computer

The End!
```

When a loop is used in a loop, the loop is executed once for each step of the outer loop. Now let's see how each color works with each machine:

```
colour = ["black", "white", "red"]
car = ["Spark", "Nexia", "Lacetti"]
for x in colour:
     for y in car:
         print(x,y)
```

```
black Spark
black Nexia
black Lacetti
white Spark
white Nexia
white Lacetti
red Spark
red Nexia
red Lacetti
```

A for loop, like a while loop, cannot be empty. That is during the cycle, we must include what actions will be performed. But if this action is not yet clear, we use the pass keyword to avoid errors in our code, and that part is ignored when the program starts. For example, we now enter the *pass* keyword without entering the action that should be performed during the loop. There is no error because the pass keyword is set. But the hash does not perform any action, because no action was ordered.

```
for x in range(5):
    pass
```

```
= RESTART: C:/Use
/Programs/Python/
```

Python programming language has its own environment. It is convenient to work and has a wide range of options. Including the possibilities of the for operator mentioned in this article. But in the article, only its main features and field of application were mentioned.

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