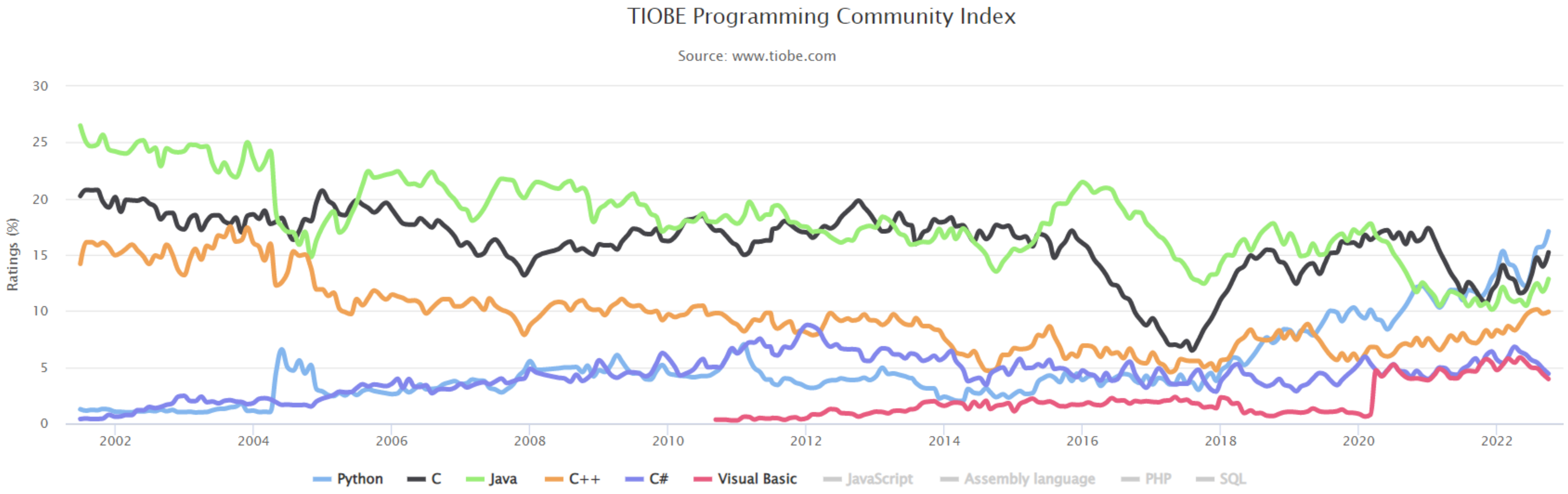
Статистика использования языков

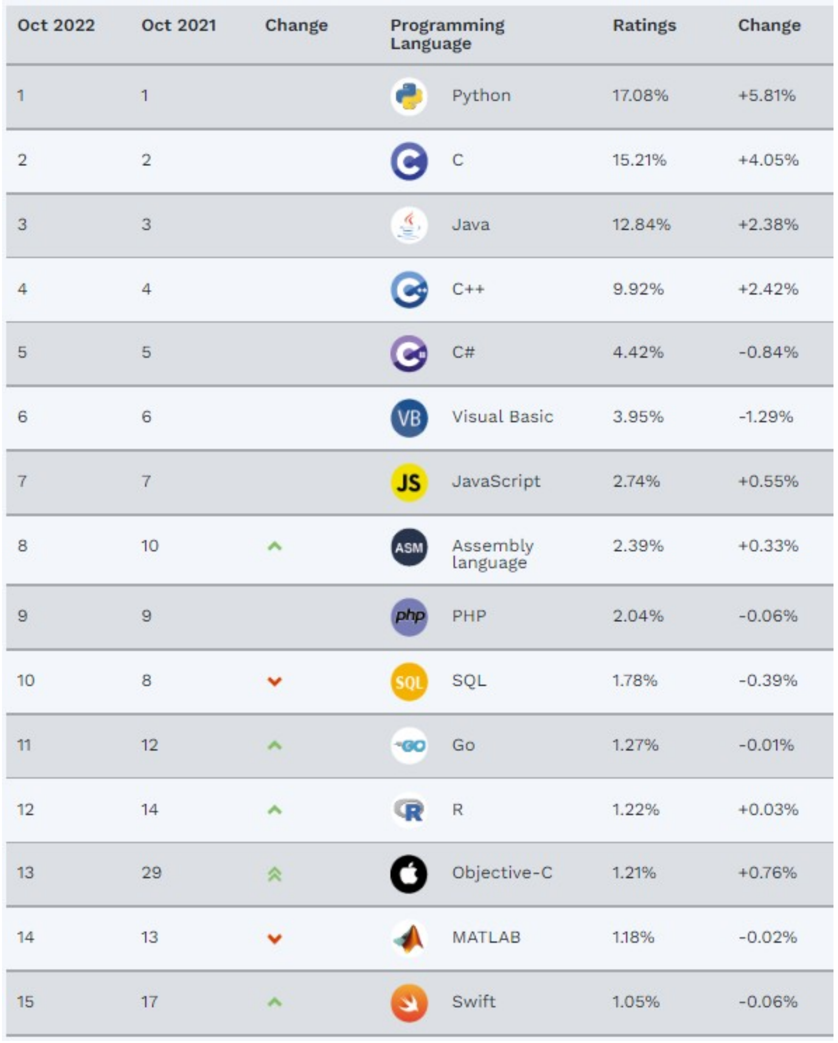


https://www.tiobe.com/tiobe-index/

Статистика использования языков (2)

Python:

September 2017 = 2,98%
September 2018 = 7,65%
September 2019 = 9,88%
September 2020 = 10,47%
September 2021 = 11,67%
September 2022 = 15,74%



Oct 2022	Oct 2021	Change	Programming Language	Ratings	Change
1	1		Python	17.08%	+5.81%
2	2		C	15.21%	+4.05%
3	3		Java	12.84%	+2.38%
4	4		C++	9.92%	+2.42%
5	5		C#	4.42%	-0.84%
6	6		Visual Basic	3.95%	-1.29%
7	7		JavaScript	2.74%	+0.55%
8	10	↑	Assembly language	2.39%	+0.33%
9	9		PHP	2.04%	-0.06%
10	8	↓	SQL	1.78%	-0.39%
11	12	↑	Go	1.27%	-0.01%
12	14	↑	R	1.22%	+0.03%
13	29	⇈	Objective-C	1.21%	+0.76%
14	13	↓	MATLAB	1.18%	-0.02%
15	17	↑	Swift	1.05%	-0.06%

Языки программирования лидеров IT-рынка

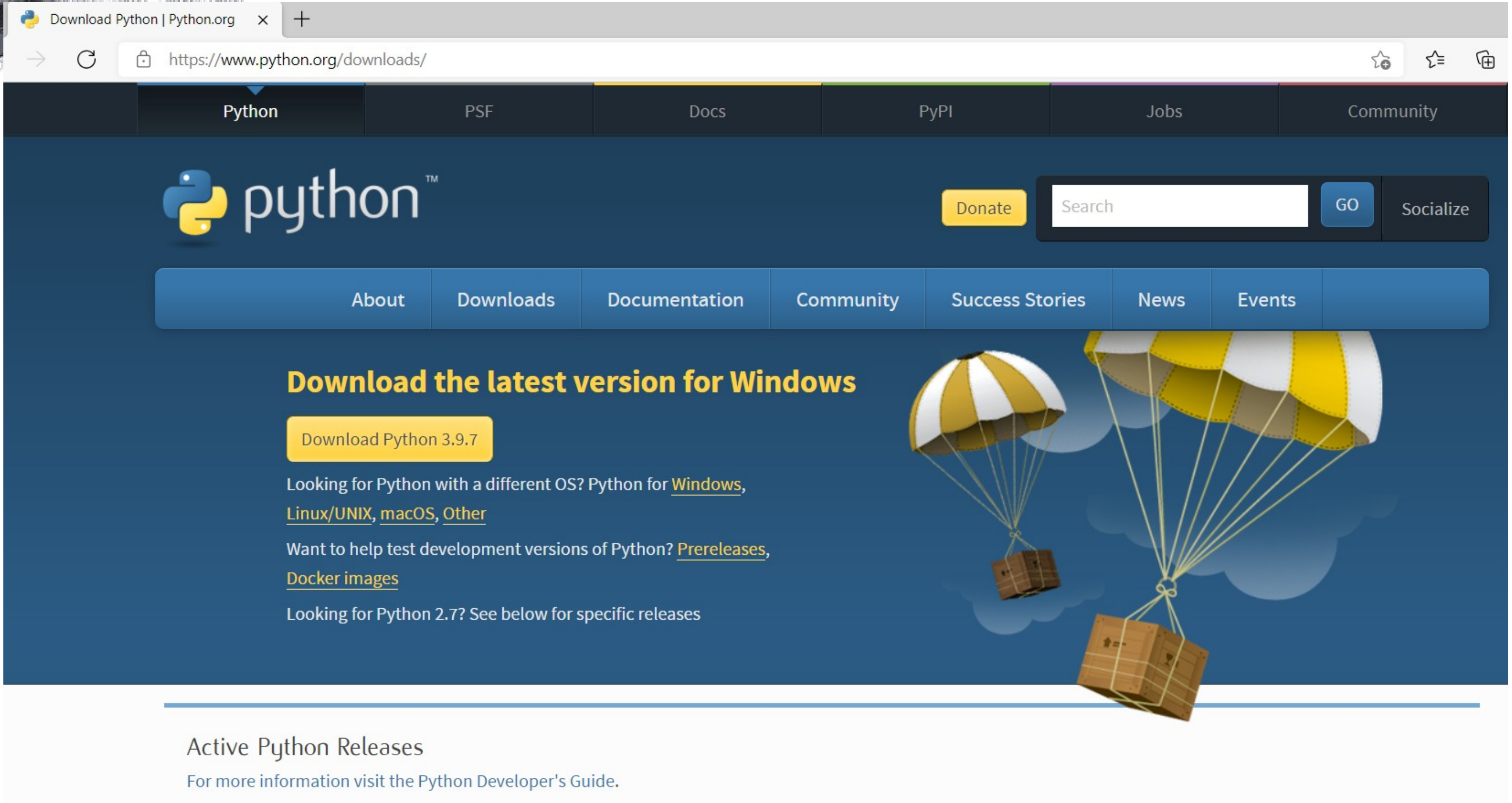
SAMSUNG	C, C++, Java, Python, JavaScript
Microsoft	C, C++, C#, HTML5/JavaScript
Google	C, C++, Java, Python, Go, HTML5/JavaScript
	Objective-C, Swift
facebook	PHP, HTML5/JavaScript, Hack
Интернет-стартапы	Python, Ruby

Особенности языка Python

```
In [6]:

for i in range(20):
print (i)

  File "<ipython-input-6-db022ee2e780>",
line 2
    print (i)
        ^

IndentationError: expected an indented b
lock
```

```
for i in range(20):
    print (i)
```

Установка



Download Python | Python.org

https://www.python.org/downloads/

Download the latest version for Windows

Download Python 3.9.7

Looking for Python with a different OS? Python for Windows, Linux/UNIX, macOS, Other

Want to help test development versions of Python? Prereleases, Docker images

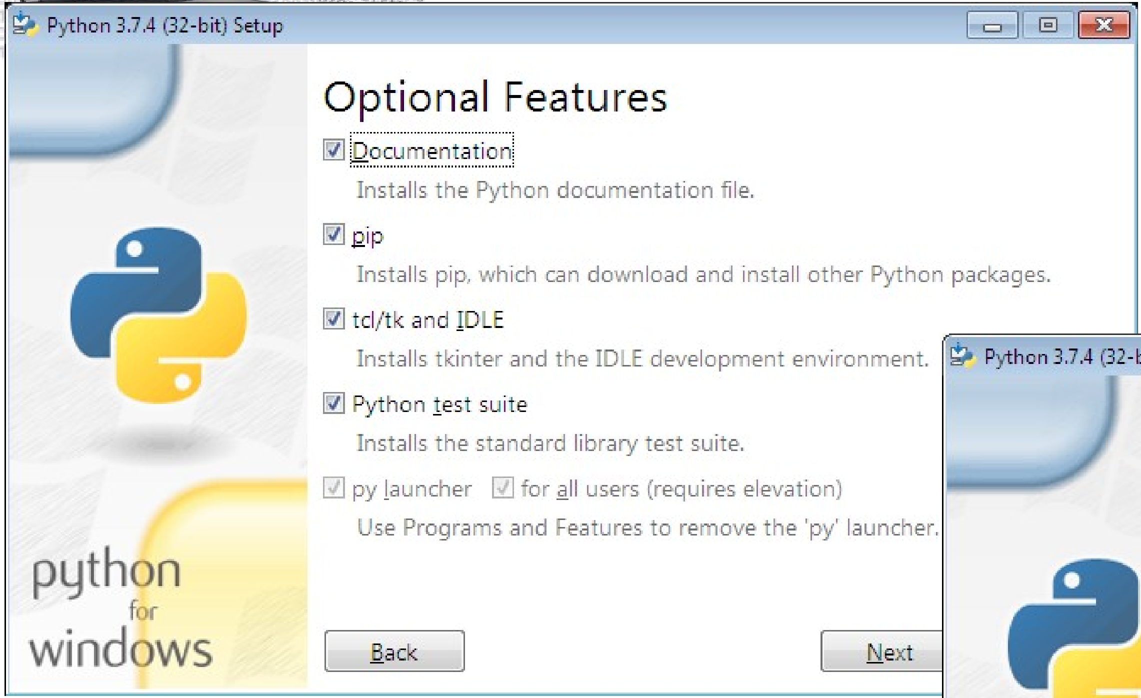
Looking for Python 2.7? See below for specific releases

Active Python Releases

For more information visit the Python Developer's Guide.

https://www.python.org/downloads/

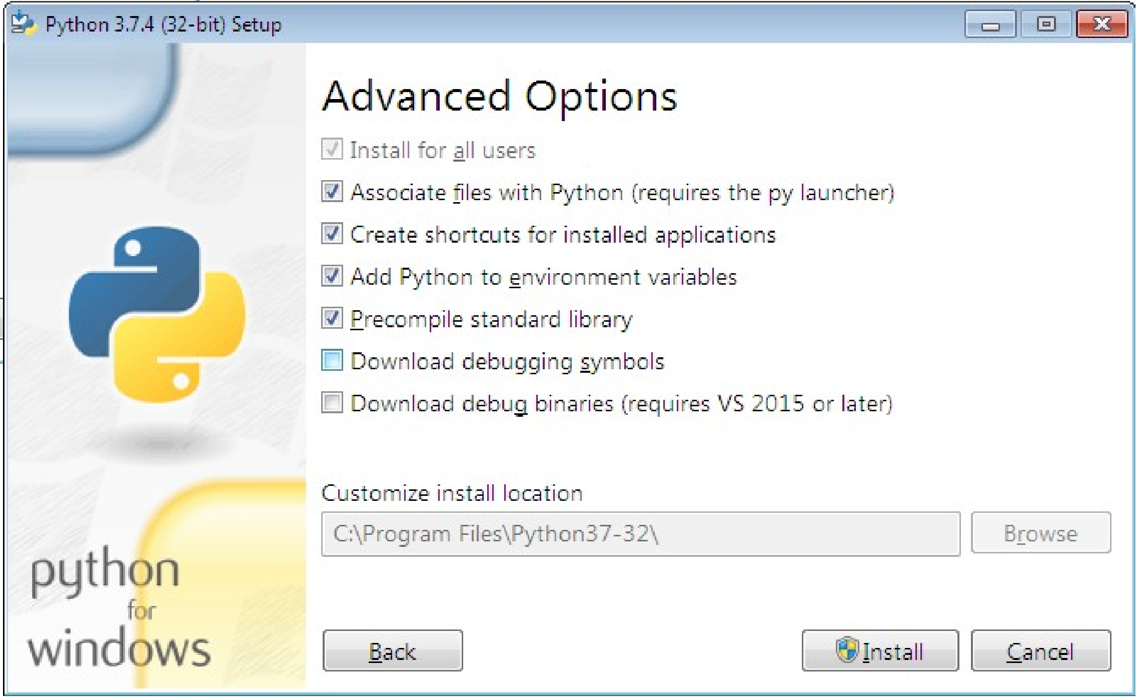
Установка(2)



Python 3.7.4 (32-bit) Setup

Optional Features

- [✓] Documentation
  Installs the Python documentation file.
- [✓] pip
  Installs pip, which can download and install other Python packages.
- [✓] tcl/tk and IDLE
  Installs tkinter and the IDLE development environment.
- [✓] Python test suite
  Installs the standard library test suite.
- [✓] py launcher [✓] for all users (requires elevation)
  Use Programs and Features to remove the 'py' launcher.



Python 3.7.4 (32-bit) Setup

Advanced Options

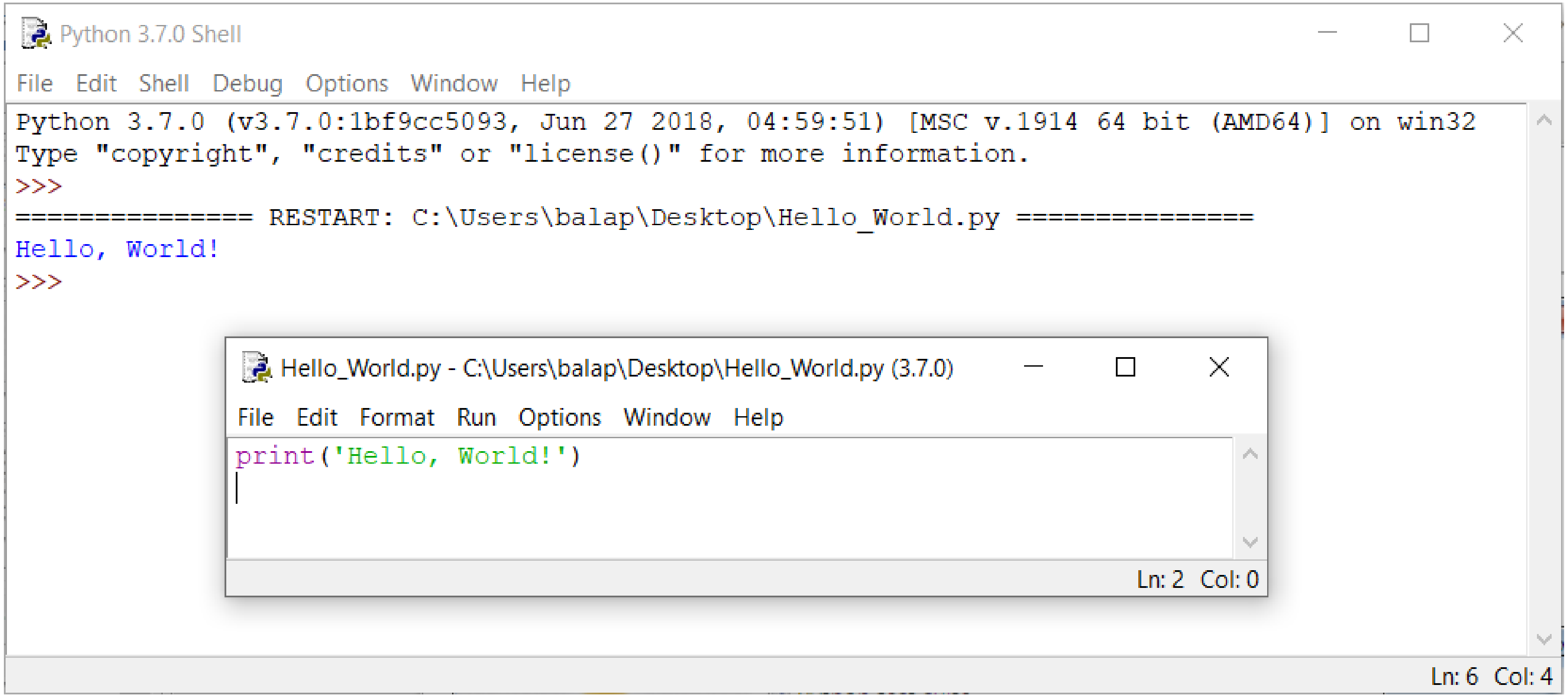
- [✓] Install for all users
- [✓] Associate files with Python (requires the py launcher)
- [✓] Create shortcuts for installed applications
- [✓] Add Python to environment variables
- [✓] Precompile standard library
- [ ] Download debugging symbols
- [ ] Download debug binaries (requires VS 2015 or later)

Customize install location

C:\Program Files\Python37-32\

Важно установить pip для дальнейшего подключения пакетов/библиотек

Hello, world!

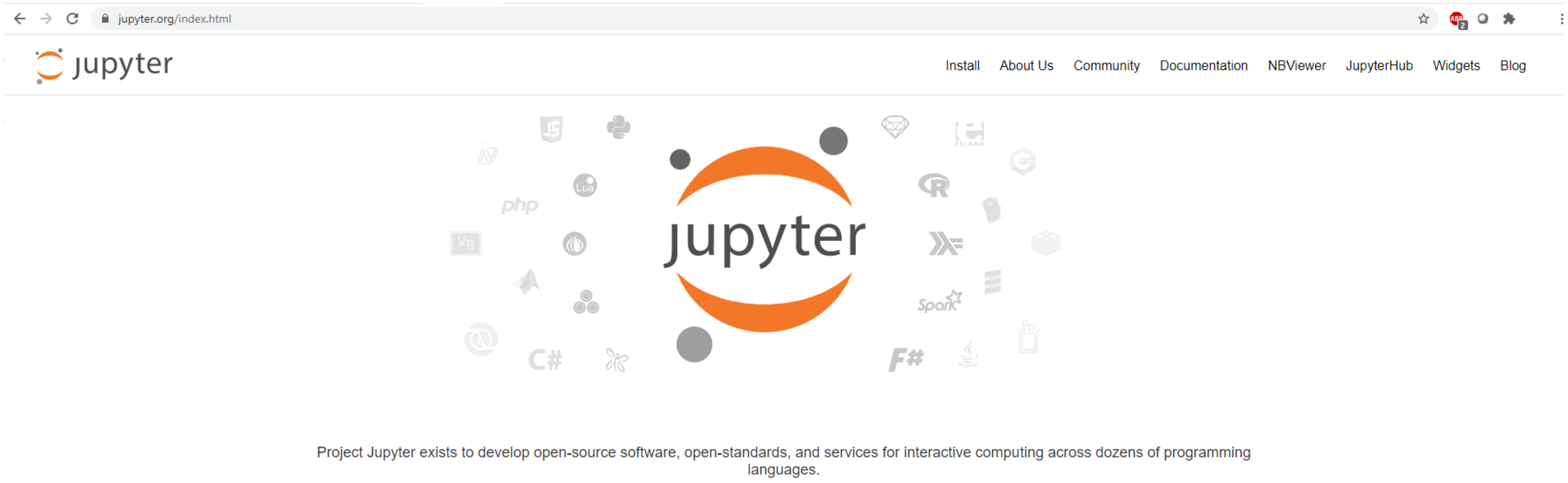

Python 3.7.0 Shell
File Edit Shell Debug Options Window Help

```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
=============== RESTART: C:\Users\balap\Desktop\Hello_World.py ===============
Hello, World!
>>>
```

Ln: 6 Col: 4
Hello_World.py - C:\Users\balap\Desktop\Hello_World.py (3.7.0)
File Edit Format Run Options Window Help

```python
print('Hello, World!')
```

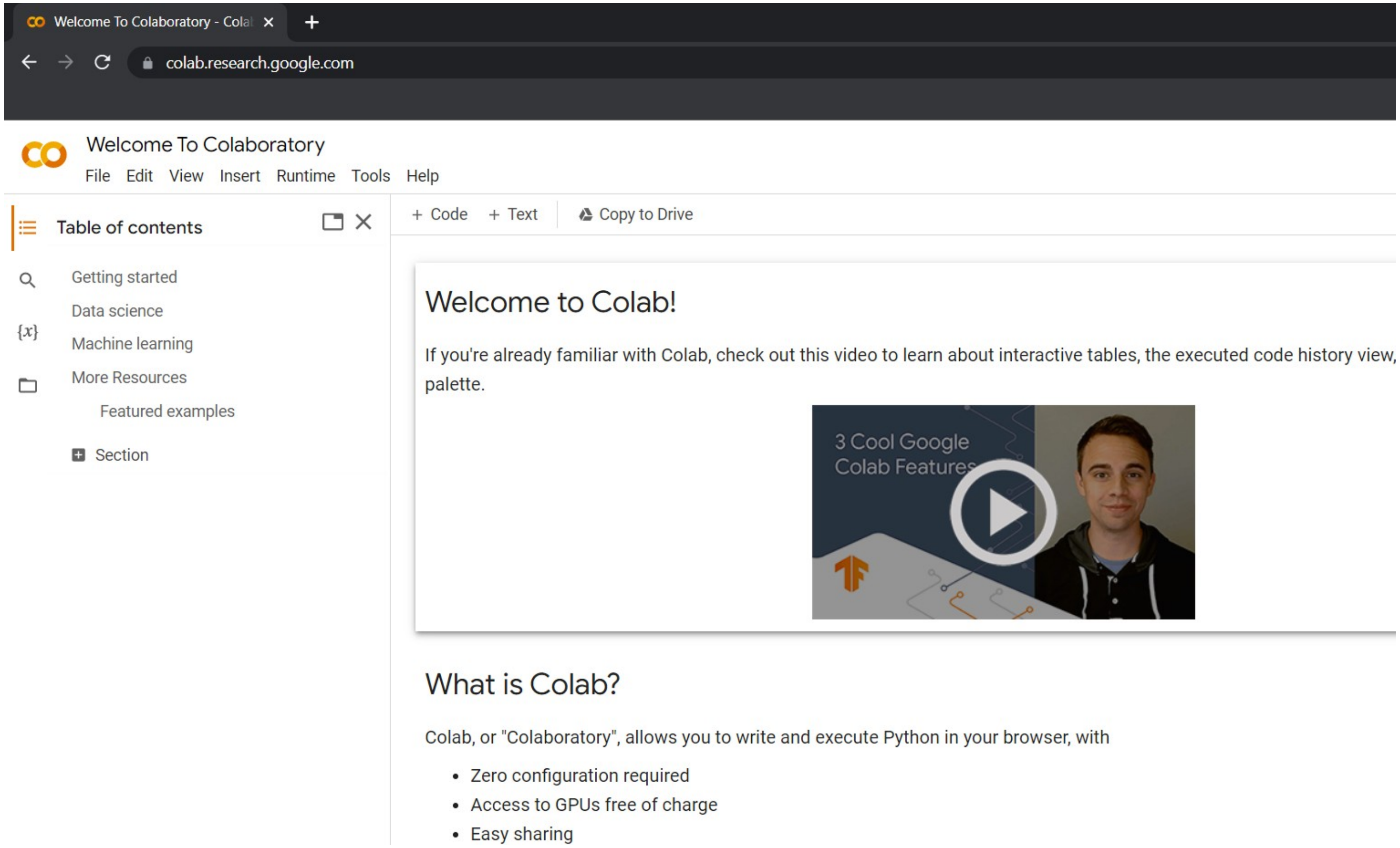
Environmnet Jupyter



Project Jupyter exists to develop open-source software, open-standards, and services for interactive computing across dozens of programming languages.

Environmnet Colab

Онлайн Jupiter для целей ML&DS



Welcome To Colaboratory - Colab

colab.research.google.com

Welcome To Colaboratory

Table of contents

- Getting started
- Data science
- Machine learning
- More Resources
  - Featured examples
- Section

Welcome to Colab!

If you're already familiar with Colab, check out this video to learn about interactive tables, the executed code history view, palette.

What is Colab?

Colab, or "Colaboratory", allows you to write and execute Python in your browser, with

- Zero configuration required
- Access to GPUs free of charge
- Easy sharing

!pip — для установки библиотек

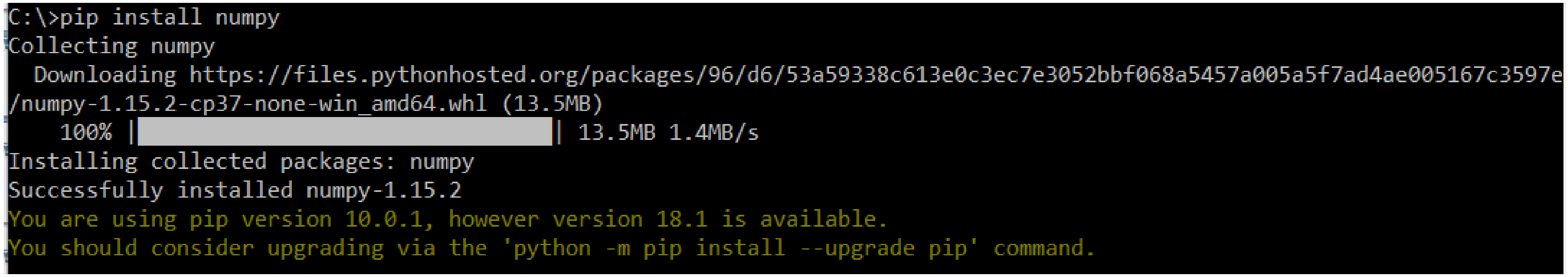
! — при использовании bash-скриптов

Примеры команд

pip install --upgrade ipython jupyter
pip install jupyterlab

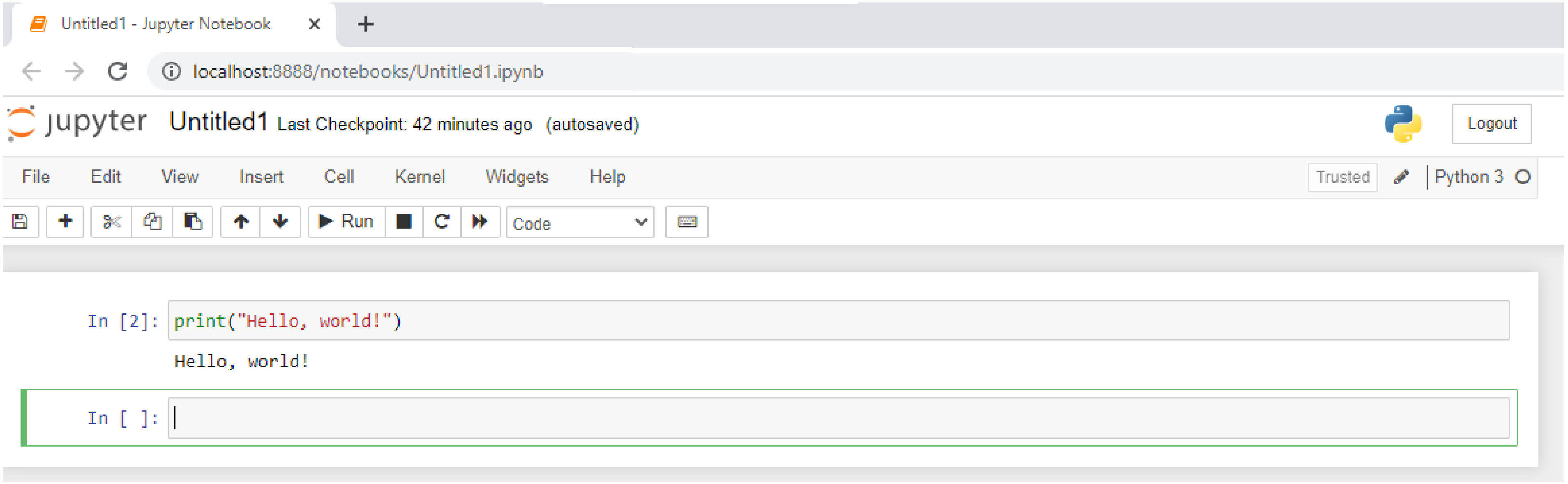
cd C:\Users\<USER_NAME>\AppData\Local\Programs\Python\Python37\Scripts

jupyter-notebook.exe



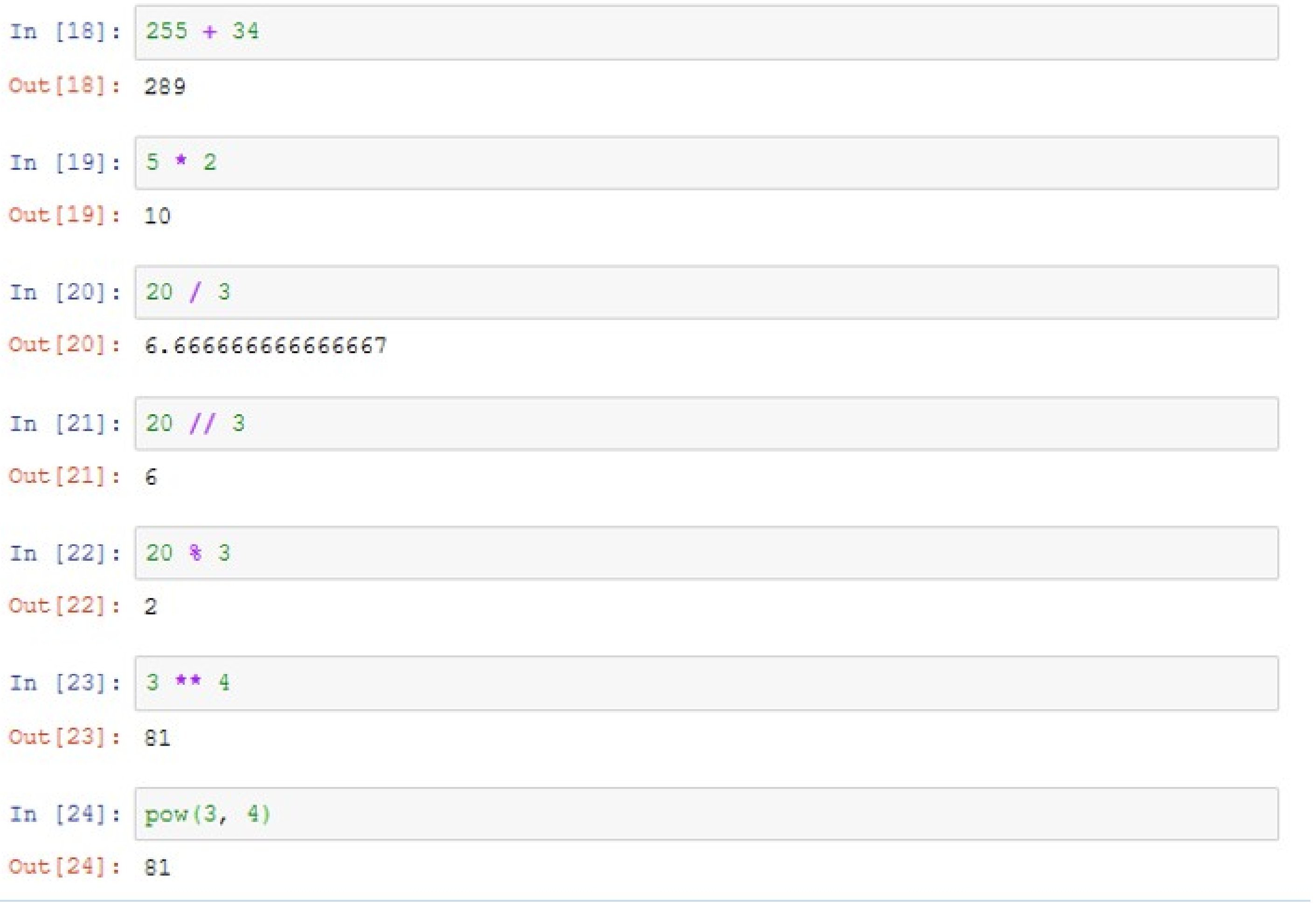
```
C:\>pip install numpy
Collecting numpy
  Downloading https://files.pythonhosted.org/packages/96/d6/53a59338c613e0c3ec7e3052bbf068a5457a005a5f7ad4ae005167c3597e
/numpy-1.15.2-cp37-none-win_amd64.whl (13.5MB)
    100% |████████████████████████████████| 13.5MB 1.4MB/s
Installing collected packages: numpy
Successfully installed numpy-1.15.2
You are using pip version 10.0.1, however version 18.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
```

Hello, world! (2)


Untitled1 - Jupyter Notebook
localhost:8888/notebooks/Untitled1.ipynb
jupyter
Untitled1 Last Checkpoint: 42 minutes ago (autosaved)
Logout
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Trusted
Python 3
Run
Code

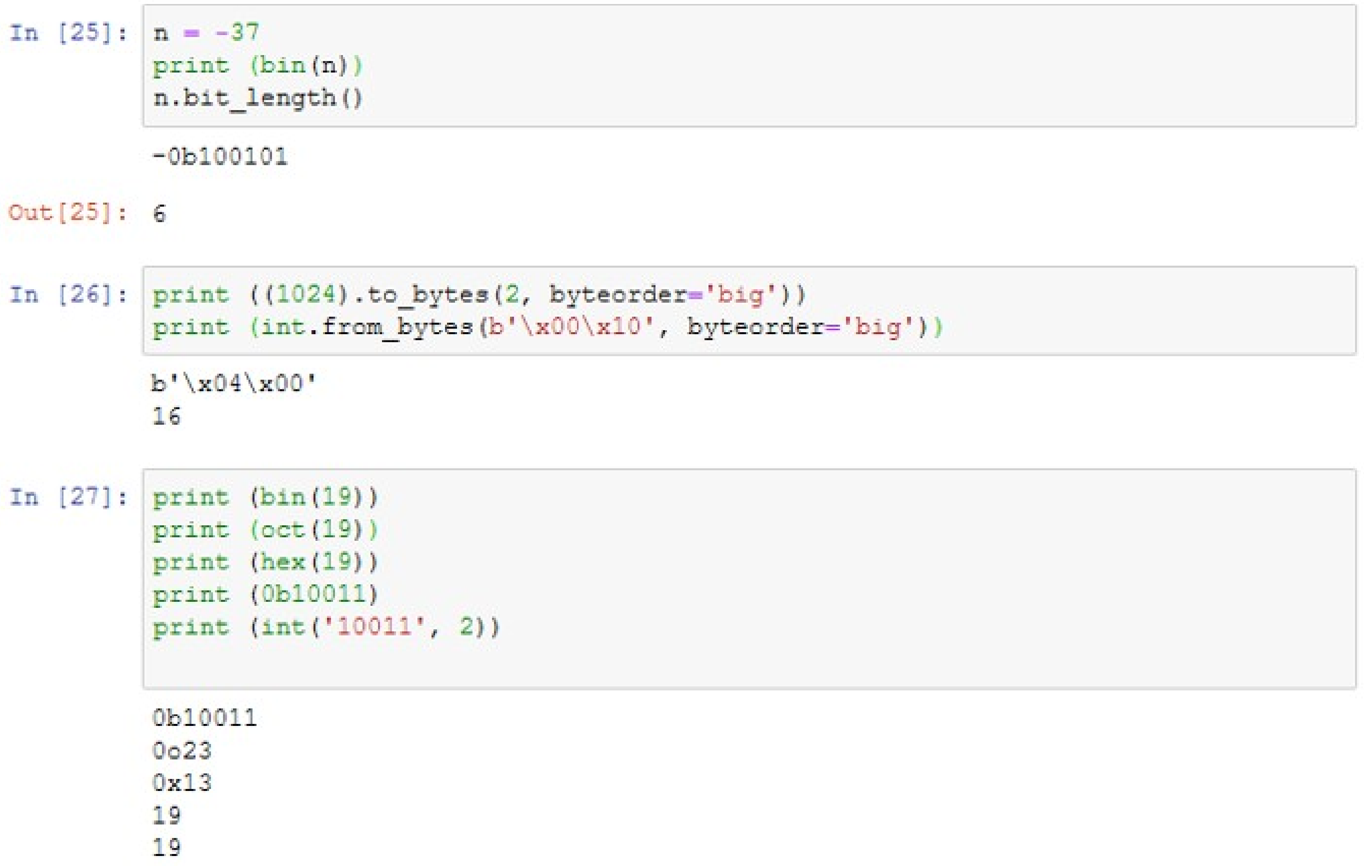
```
In [2]: print("Hello, world!")

        Hello, world!

In [ ]:
```

Функции в Python



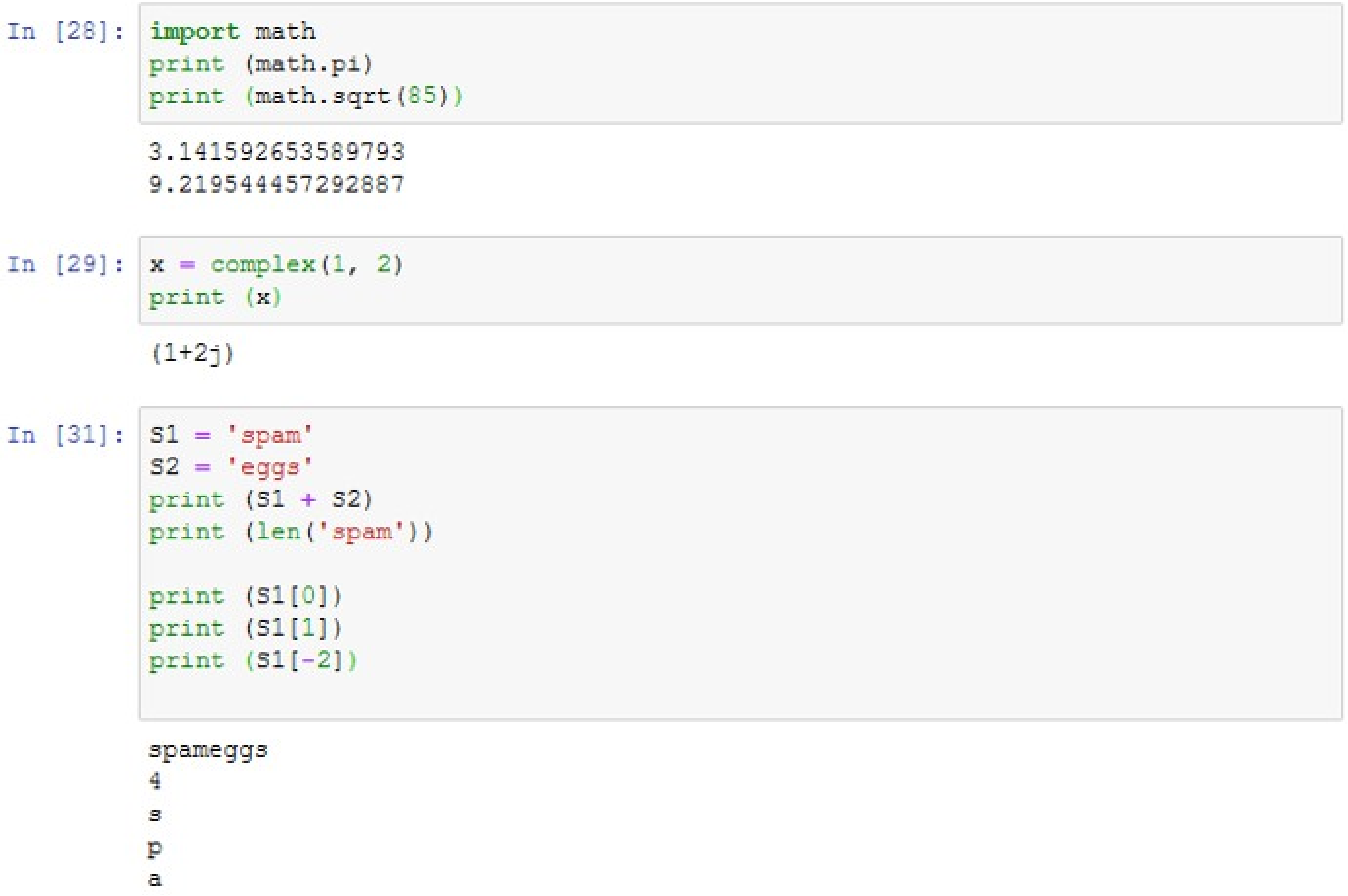
```
In [18]: 255 + 34
Out[18]: 289

In [19]: 5 * 2
Out[19]: 10

In [20]: 20 / 3
Out[20]: 6.666666666666667

In [21]: 20 // 3
Out[21]: 6

In [22]: 20 % 3
Out[22]: 2

In [23]: 3 ** 4
Out[23]: 81

In [24]: pow(3, 4)
Out[24]: 81
```

Функции в Python(2)



```
In [25]: n = -37
         print (bin(n))
         n.bit_length()

         -0b100101

Out[25]: 6

In [26]: print ((1024).to_bytes(2, byteorder='big'))
         print (int.from_bytes(b'\x00\x10', byteorder='big'))

         b'\x04\x00'
         16

In [27]: print (bin(19))
         print (oct(19))
         print (hex(19))
         print (0b10011)
         print (int('10011', 2))

         0b10011
         0o23
         0x13
         19
         19
```

Функции в Python(3)

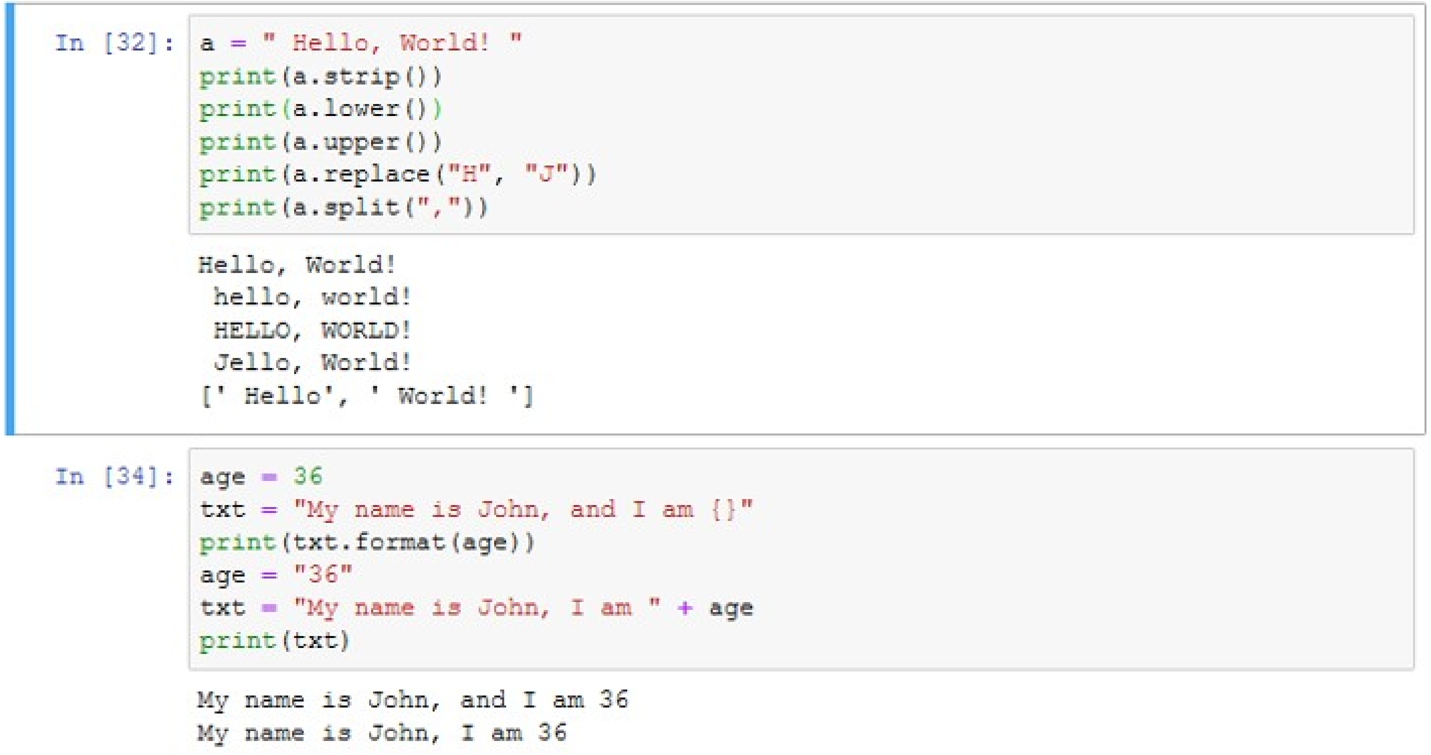


```
In [28]: import math
         print (math.pi)
         print (math.sqrt(85))

3.141592653589793
9.219544457292887
```

```
In [29]: x = complex(1, 2)
         print (x)

(1+2j)
```

```
In [31]: S1 = 'spam'
         S2 = 'eggs'
         print (S1 + S2)
         print (len('spam'))

         print (S1[0])
         print (S1[1])
         print (S1[-2])

spameggs
4
s
p
a
```

Функции в Python(4)



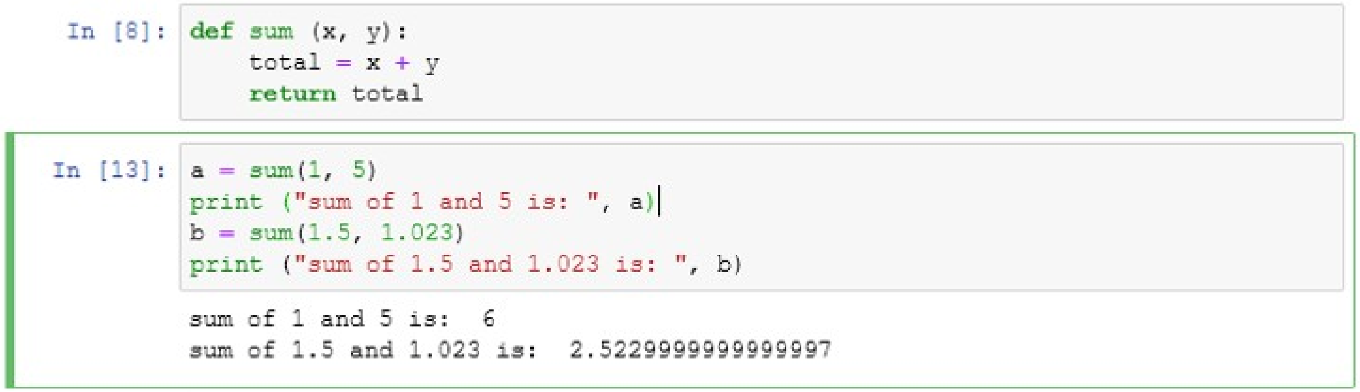
```
In [32]: a = " Hello, World! "
         print(a.strip())
         print(a.lower())
         print(a.upper())
         print(a.replace("H", "J"))
         print(a.split(","))
```

```
Hello, World!
 hello, world!
 HELLO, WORLD!
 Jello, World!
[' Hello', ' World! ']
```

```
In [34]: age = 36
         txt = "My name is John, and I am {}"
         print(txt.format(age))
         age = "36"
         txt = "My name is John, I am " + age
         print(txt)
```

```
My name is John, and I am 36
My name is John, I am 36
```

Функции в Python(5)

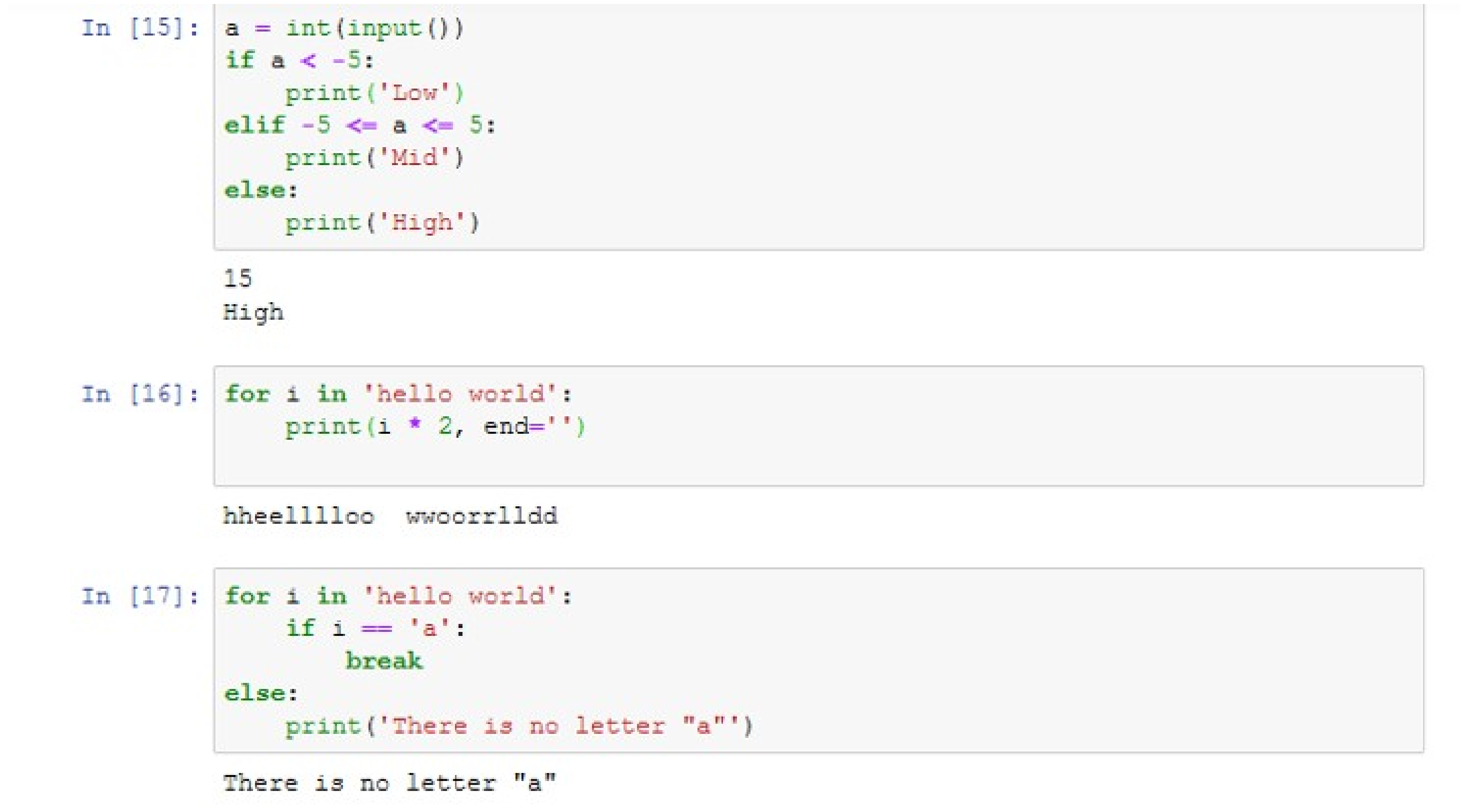


```
In [8]:  def sum (x, y):
             total = x + y
             return total
```

```
In [13]: a = sum(1, 5)
         print ("sum of 1 and 5 is: ", a)
         b = sum(1.5, 1.023)
         print ("sum of 1.5 and 1.023 is: ", b)
```

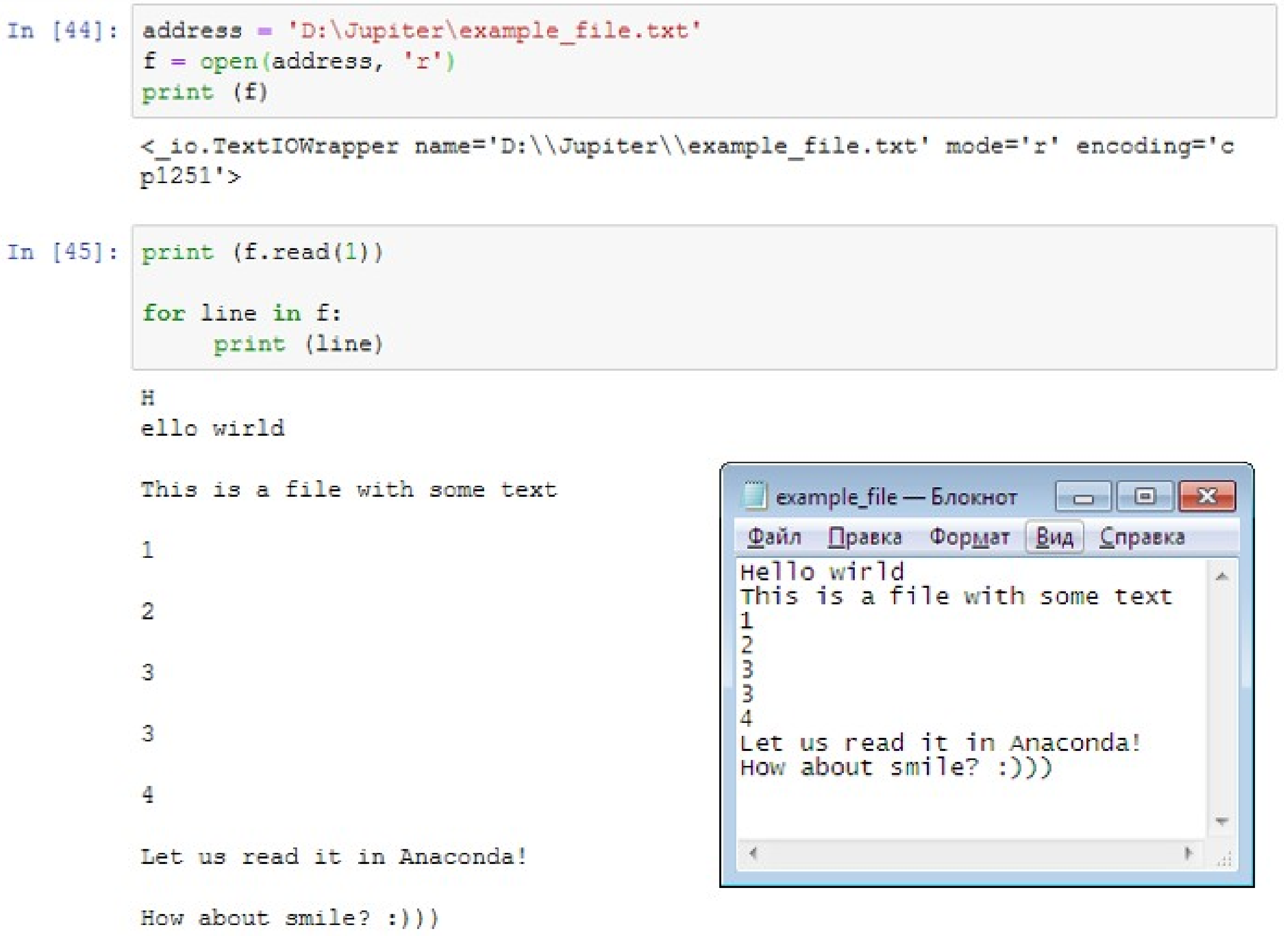
```
sum of 1 and 5 is:  6
sum of 1.5 and 1.023 is:  2.5229999999999997
```

Функции в Python(6)



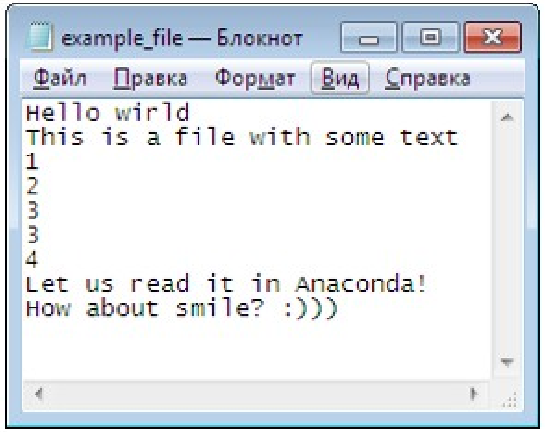
```
In [15]: a = int(input())
         if a < -5:
             print('Low')
         elif -5 <= a <= 5:
             print('Mid')
         else:
             print('High')

         15
         High

In [16]: for i in 'hello world':
             print(i * 2, end='')

         hheelllloo  wwoorrlldd

In [17]: for i in 'hello world':
             if i == 'a':
                 break
         else:
             print('There is no letter "a"')

         There is no letter "a"
```

Работа с файлами в Python



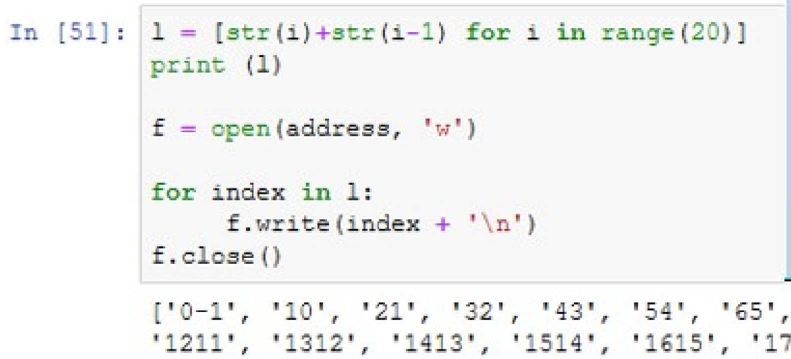
```
In [44]: address = 'D:\Jupiter\example_file.txt'
         f = open(address, 'r')
         print (f)

<_io.TextIOWrapper name='D:\\Jupiter\\example_file.txt' mode='r' encoding='c
p1251'>
```

```
In [45]: print (f.read(1))

         for line in f:
             print (line)

H
ello wirld

This is a file with some text

1

2

3

3

4

Let us read it in Anaconda!

How about smile? :)))
```

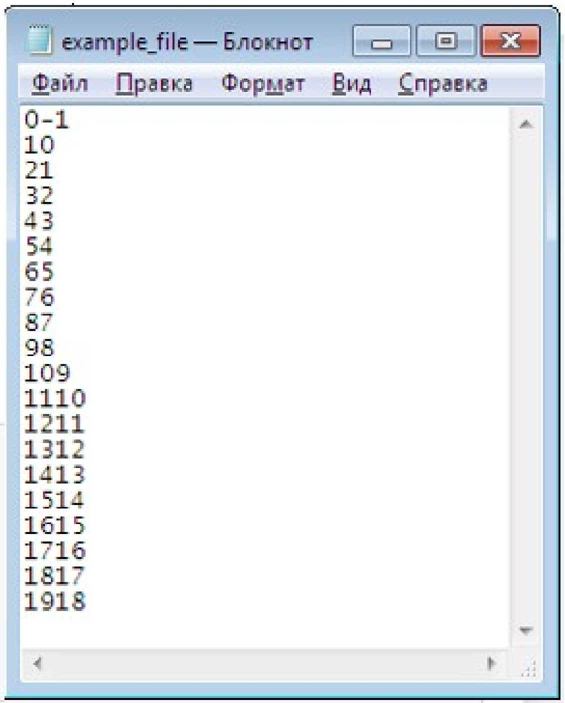


```
Hello wirld
This is a file with some text
1
2
3
3
4
Let us read it in Anaconda!
How about smile? :)))
```

Работа с файлами в Python(2)

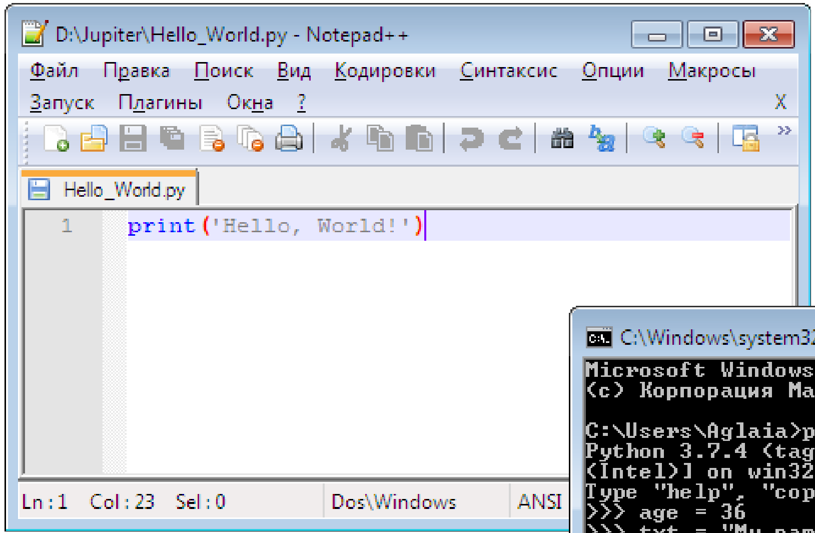


```
In [51]: l = [str(i)+str(i-1) for i in range(20)]
         print (l)

         f = open(address, 'w')

         for index in l:
             f.write(index + '\n')
         f.close()

['0-1', '10', '21', '32', '43', '54', '65', '76', '87', '98', '109', '1110',
'1211', '1312', '1413', '1514', '1615', '1716', '1817', '1918']
```

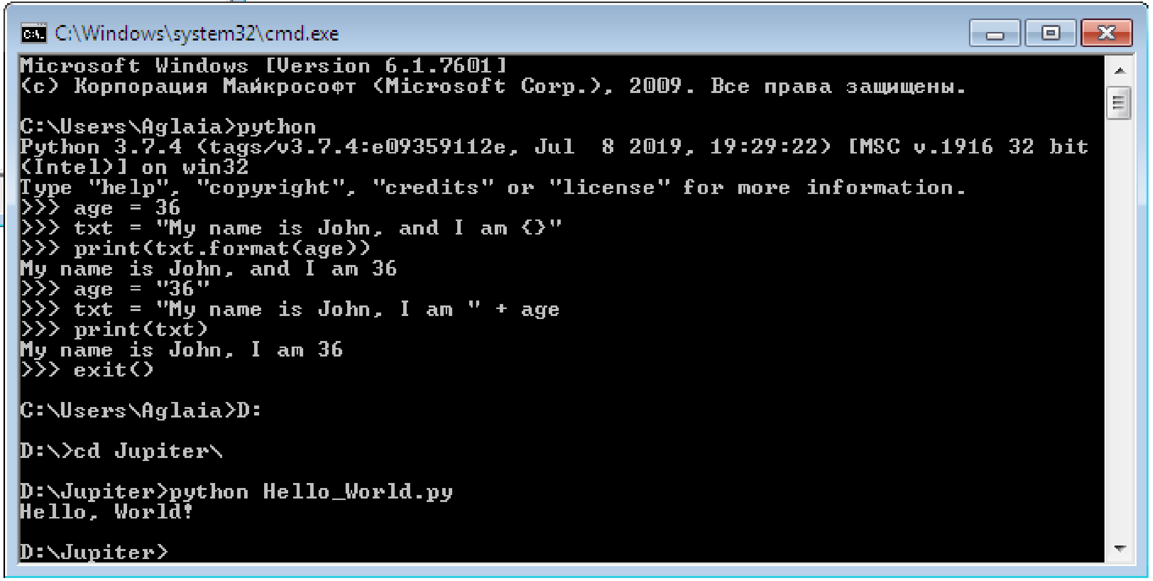


```
0-1
10
21
32
43
54
65
76
87
98
109
1110
1211
1312
1413
1514
1615
1716
1817
1918
```

Запуск из командной строки


D:\Jupiter\Hello_World.py - Notepad++
Файл Правка Поиск Вид Кодировки Синтаксис Опции Макросы
Запуск Плагины Окна ?
Hello_World.py
Ln : 1 Col : 23 Sel : 0 Dos\Windows ANSI

```
print('Hello, World!')
```



```
Microsoft Windows [Version 6.1.7601]
(c) Корпорация Майкрософт (Microsoft Corp.), 2009. Все права защищены.

C:\Users\Aglaia>python
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 19:29:22) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> age = 36
>>> txt = "My name is John, and I am {}"
>>> print(txt.format(age))
My name is John, and I am 36
>>> age = "36"
>>> txt = "My name is John, I am " + age
>>> print(txt)
My name is John, I am 36
>>> exit()

C:\Users\Aglaia>D:

D:\>cd Jupiter\

D:\Jupiter>python Hello_World.py
Hello, World!

D:\Jupiter>
```

Полезные функции для работы со строками

capitalize()	Converts the first character to upper case	ljust()	Returns a left justified version of the string
casefold()	Converts string into lower case	lower()	Converts a string into lower case
center()	Returns a centered string	lstrip()	Returns a left trim version of the string
count()	Returns the number of times a specified value occurs in a string	maketrans()	Returns a translation table to be used in translations
encode()	Returns an encoded version of the string	partition()	Returns a tuple where the string is parted into three parts
endswith()	Returns true if the string ends with the specified value	replace()	Returns a string where a specified value is replaced with a specified value
expandtabs()	Sets the tab size of the string	rfind()	Searches the string for a specified value and returns the last position of where it was found
find()	Searches the string for a specified value and returns the position of where it was found	rindex()	Searches the string for a specified value and returns the last position of where it was found
format()	Formats specified values in a string	rjust()	Returns a right justified version of the string
format_map()	Formats specified values in a string	rpartition()	Returns a tuple where the string is parted into three parts
index()	Searches the string for a specified value and returns the position of where it was found	rsplit()	Splits the string at the specified separator, and returns a list
isalnum()	Returns True if all characters in the string are alphanumeric	rstrip()	Returns a right trim version of the string
isalpha()	Returns True if all characters in the string are in the alphabet	split()	Splits the string at the specified separator, and returns a list
isdecimal()	Returns True if all characters in the string are decimals	splitlines()	Splits the string at line breaks and returns a list

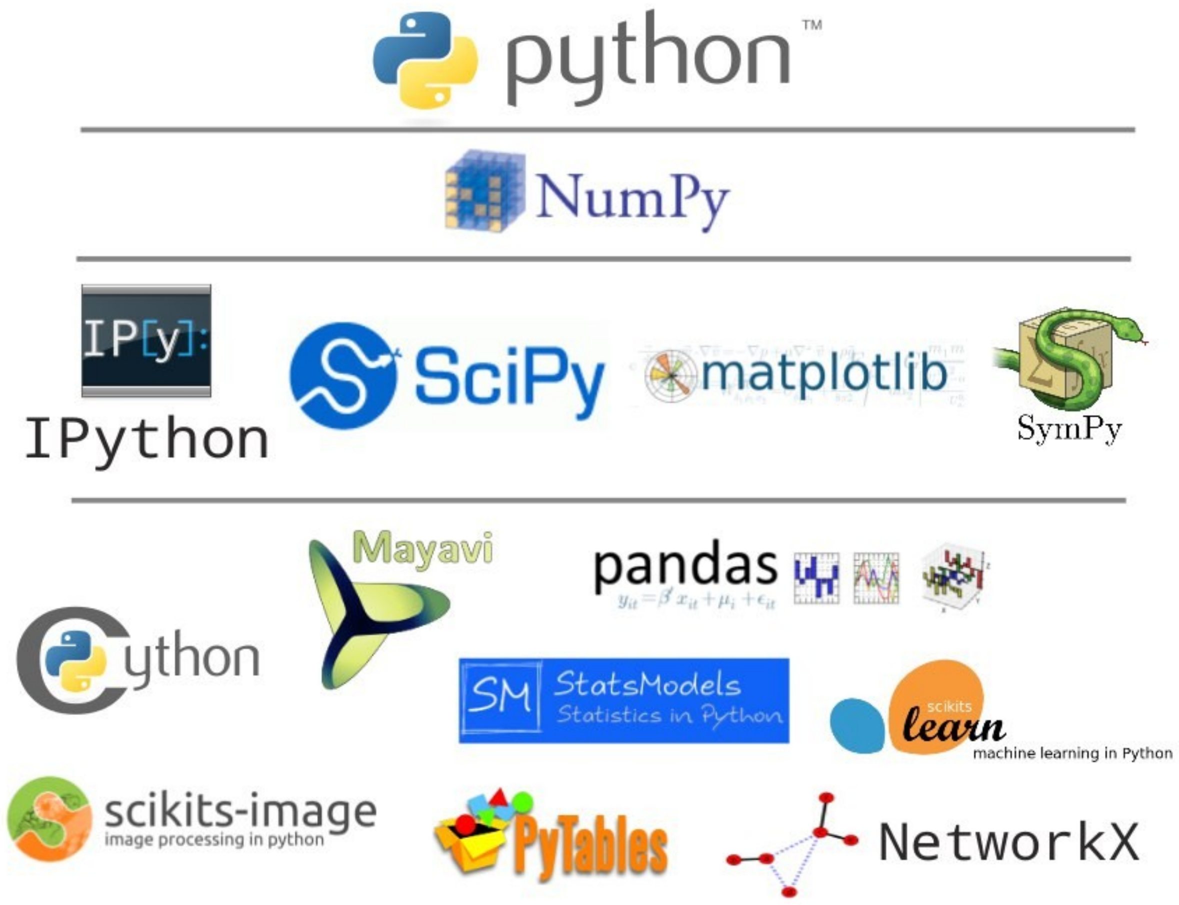
Полезные функции для работы со строками(2)

isdigit()	Returns True if all characters in the string are digits	startswith()	Returns true if the string starts with the specified value
isidentifier()	Returns True if the string is an identifier	strip()	Returns a trimmed version of the string
islower()	Returns True if all characters in the string are lower case	swapcase()	Swaps cases, lower case becomes upper case and vice versa
isnumeric()	Returns True if all characters in the string are numeric	title()	Converts the first character of each word to upper case
isprintable()	Returns True if all characters in the string are printable	translate()	Returns a translated string
isspace()	Returns True if all characters in the string are whitespaces	upper()	Converts a string into upper case
istitle()	Returns True if the string follows the rules of a title	zfill()	Fills the string with a specified number of 0 values at the beginning
isupper()	Returns True if all characters in the string are upper case	ljust()	Returns a left justified version of the string
join()	Joins the elements of an iterable to the end of the string	lower()	Converts a string into lower case
capitalize()	Converts the first character to upper case	lstrip()	Returns a left trim version of the string
casefold()	Converts string into lower case	maketrans()	Returns a translation table to be used in translations
center()	Returns a centered string	partition()	Returns a tuple where the string is parted into three parts
count()	Returns the number of times a specified value occurs in a string	replace()	Returns a string where a specified value is replaced with a specified value
encode()	Returns an encoded version of the string	rfind()	Searches the string for a specified value and returns the last position of where it was found
endswith()	Returns true if the string ends with the specified value	rindex()	Searches the string for a specified value and returns the last position of where it was found

Полезные функции для работы со строками(3)

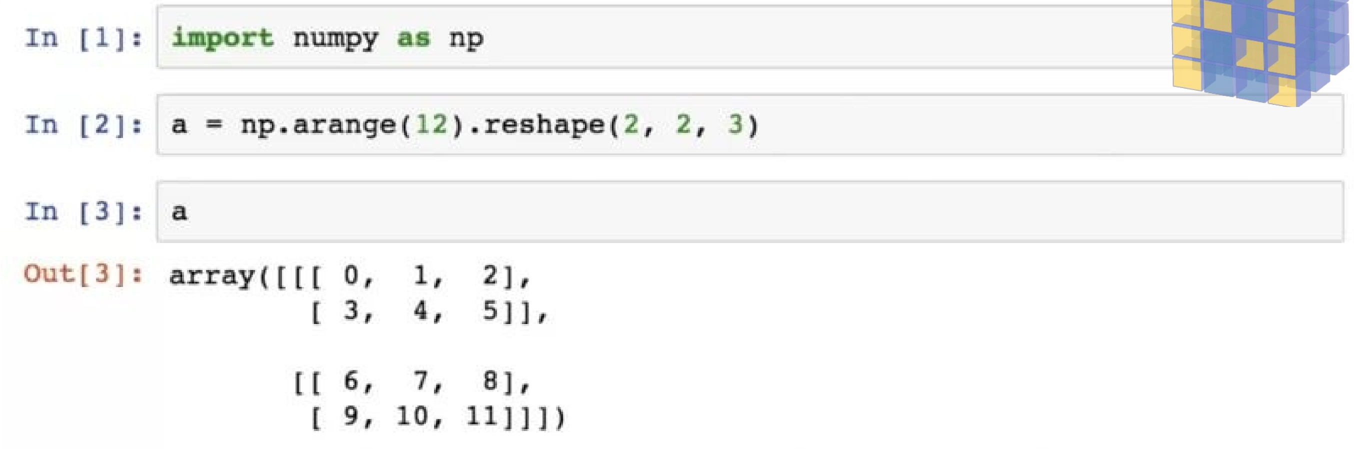
expandtabs()	Sets the tab size of the string	rjust()	Returns a right justified version of the string
find()	Searches the string for a specified value and returns the position of where it was found	rpartition()	Returns a tuple where the string is parted into three parts
format()	Formats specified values in a string	rsplit()	Splits the string at the specified separator, and returns a list
format_map()	Formats specified values in a string	rstrip()	Returns a right trim version of the string
index()	Searches the string for a specified value and returns the position of where it was found	split()	Splits the string at the specified separator, and returns a list

Дополнительные библиотеки и пакеты

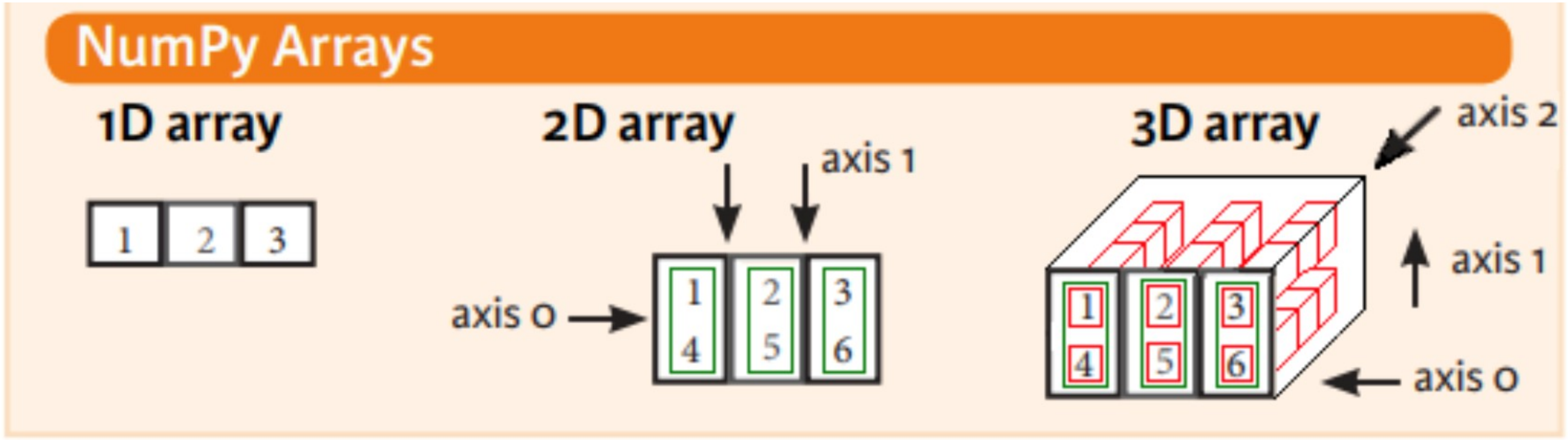

python™
NumPy
IPython
SciPy
matplotlib
SymPy
Mayavi
pandas
Cython
StatsModels Statistics in Python
scikits learn machine learning in Python
scikits-image image processing in python
PyTables
NetworkX

По материалам Жумагулова Я.В.

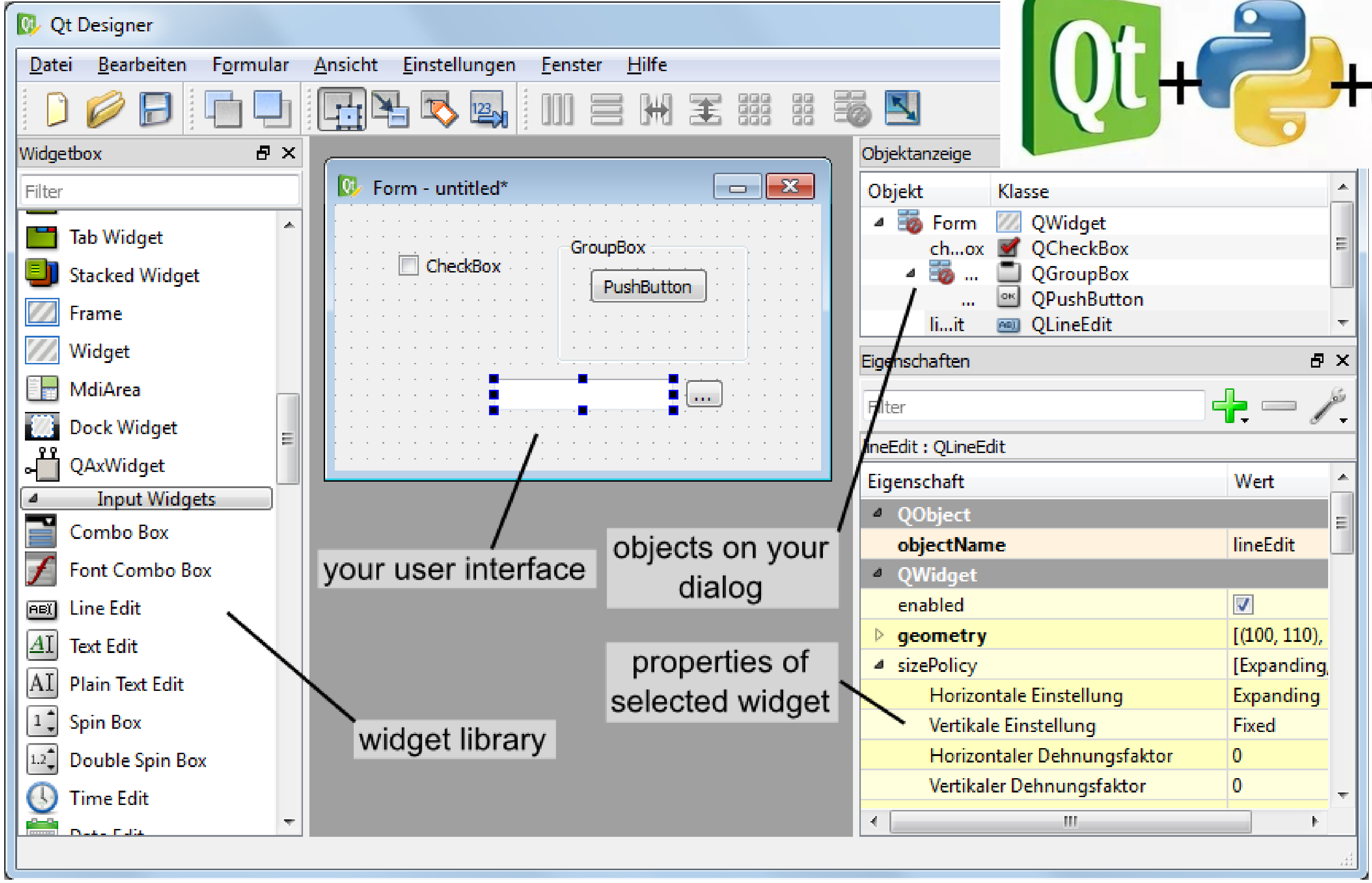
Дополнительные библиотеки и пакеты(2)



```
In [1]: import numpy as np

In [2]: a = np.arange(12).reshape(2, 2, 3)

In [3]: a

Out[3]: array([[[ 0,  1,  2],
                [ 3,  4,  5]],

               [[ 6,  7,  8],
                [ 9, 10, 11]]])
```



Дополнительные библиотеки и пакеты(3)



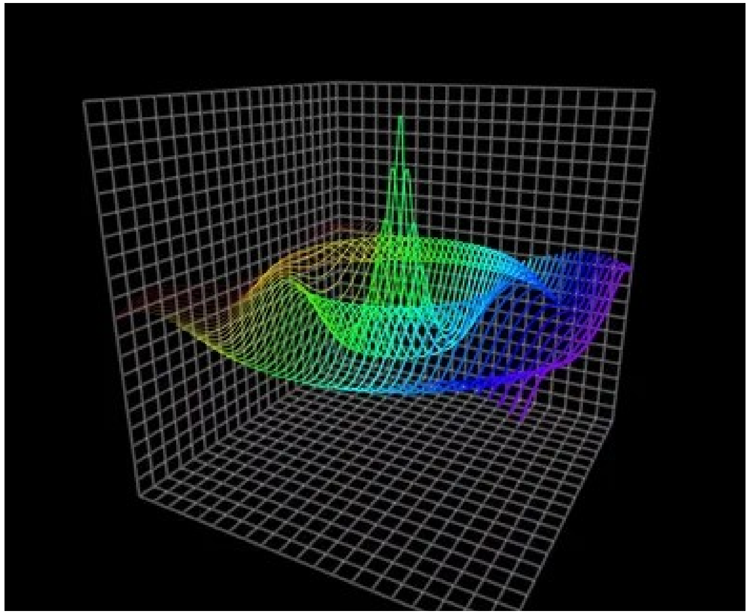
Objekt	Klasse
Form	QWidget
ch...ox	QCheckBox
...	QGroupBox
...	QPushButton
li...it	QLineEdit

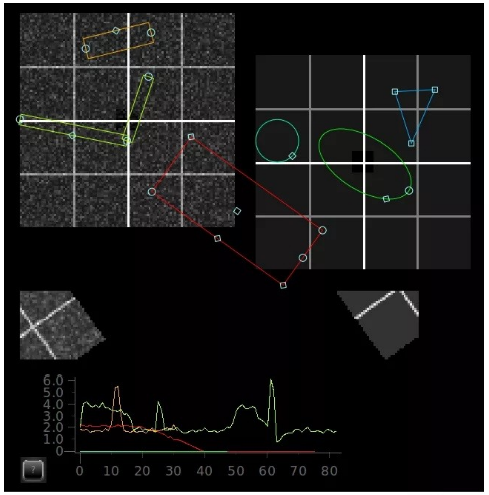
Eigenschaft	Wert
QObject	
objectName	lineEdit
QWidget	
enabled	✓
geometry	[(100, 110),
sizePolicy	[Expanding,
Horizontale Einstellung	Expanding
Vertikale Einstellung	Fixed
Horizontaler Dehnungsfaktor	0
Vertikaler Dehnungsfaktor	0

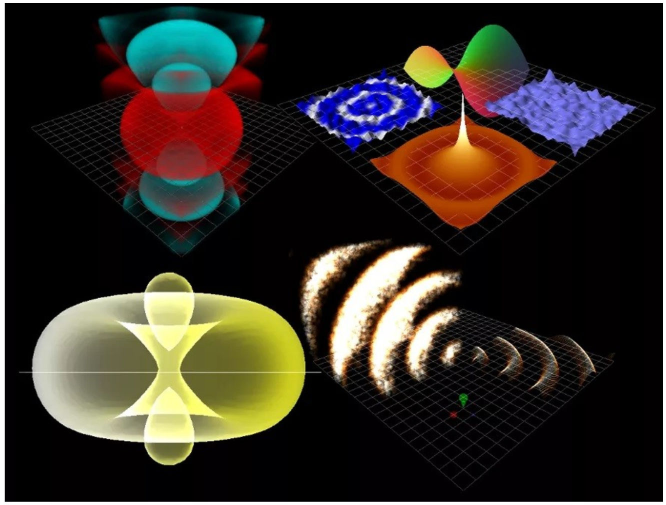
Qt + Python = PySide
Python for Qt

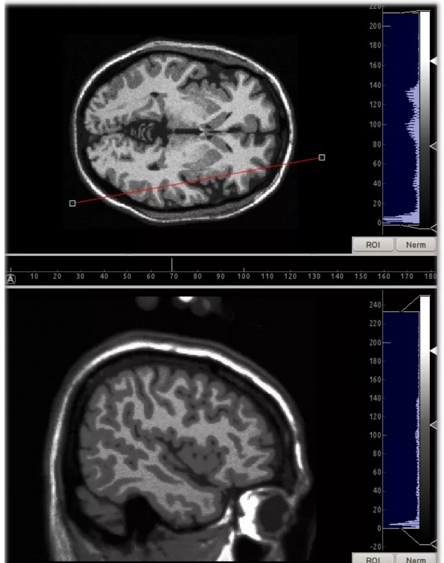
Дополнительные библиотеки и пакеты(4)

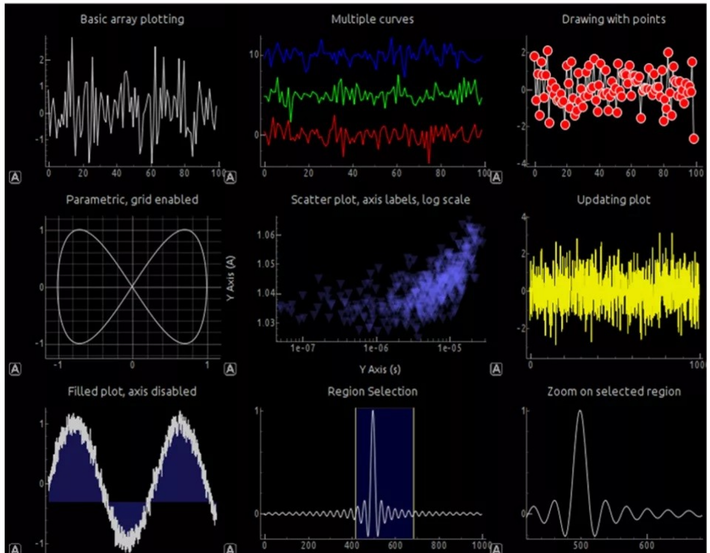
Pyqtgraph











Полезные ссылки (2)

https://ru.wikiversity.org/wiki/Программирование_и_научные_вычисления_на_языке_Python

https://realpython.com/ - Простые примеры

https://habr.com/post/352678/ - Установка и использование NumPy

https://www.lfd.uci.edu/~gohlke/pythonlibs/ - Набор готовых библиотек

https://tproger.ru/translations/jupyter-notebook-python-3/ - Командная оболочка Jupyter для интерактивных вычислений

https://www.jetbrains.com/pycharm/ - Интегрированная среда разработки

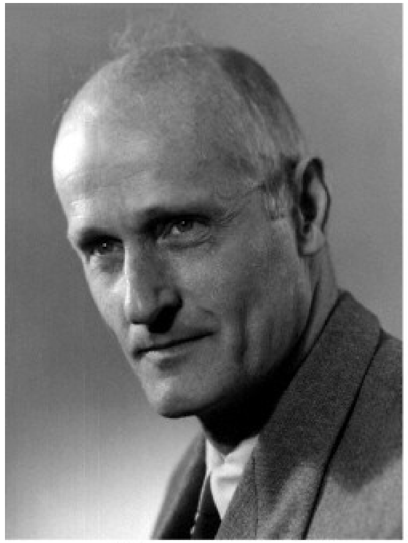
https://books.ifmo.ru/file/pdf/2256.pdf - Методическое пособие Лямина А.В.

Определение

Регулярные выражения (regular expressions) — последовательность символов, определяющая шаблон для поиска в строках.

Их поддерживают языки Python, Perl, R, C++, Java.

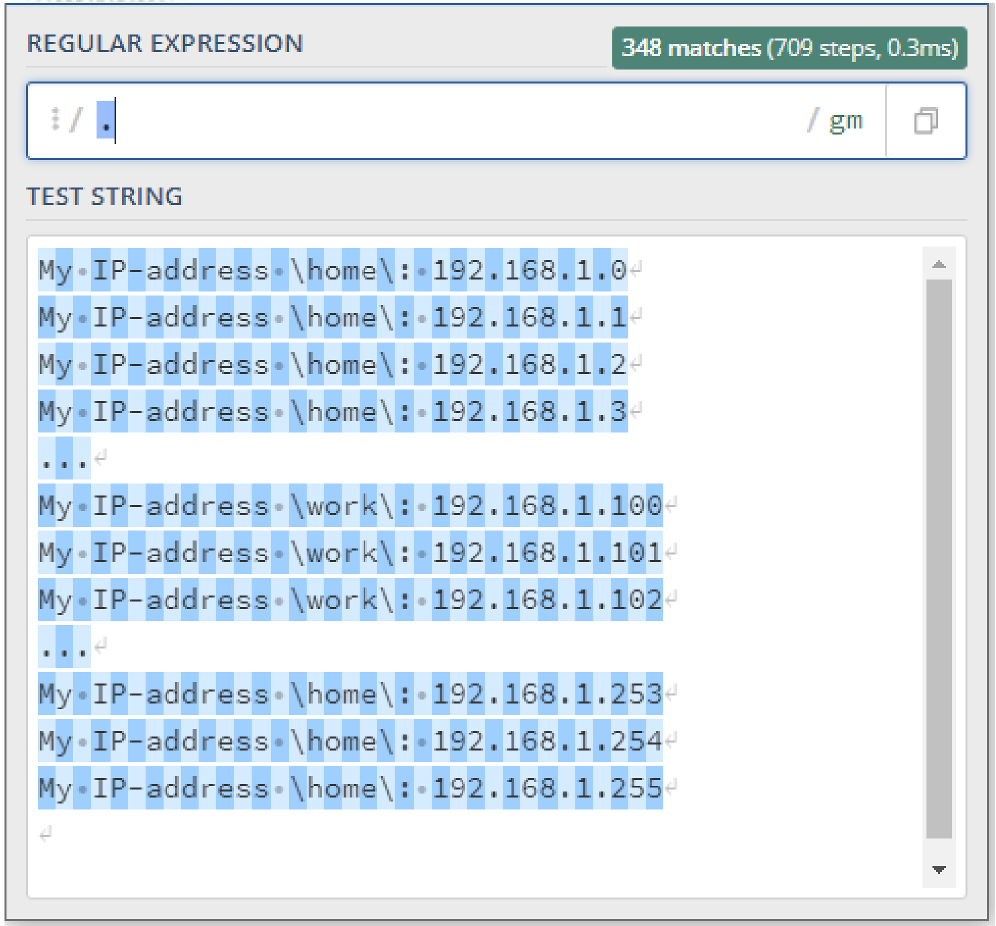
https://regex101.com/



Stephen C. Kleene

Stephen Cole Kleene
(1909-1994)

Примеры регулярных выражений



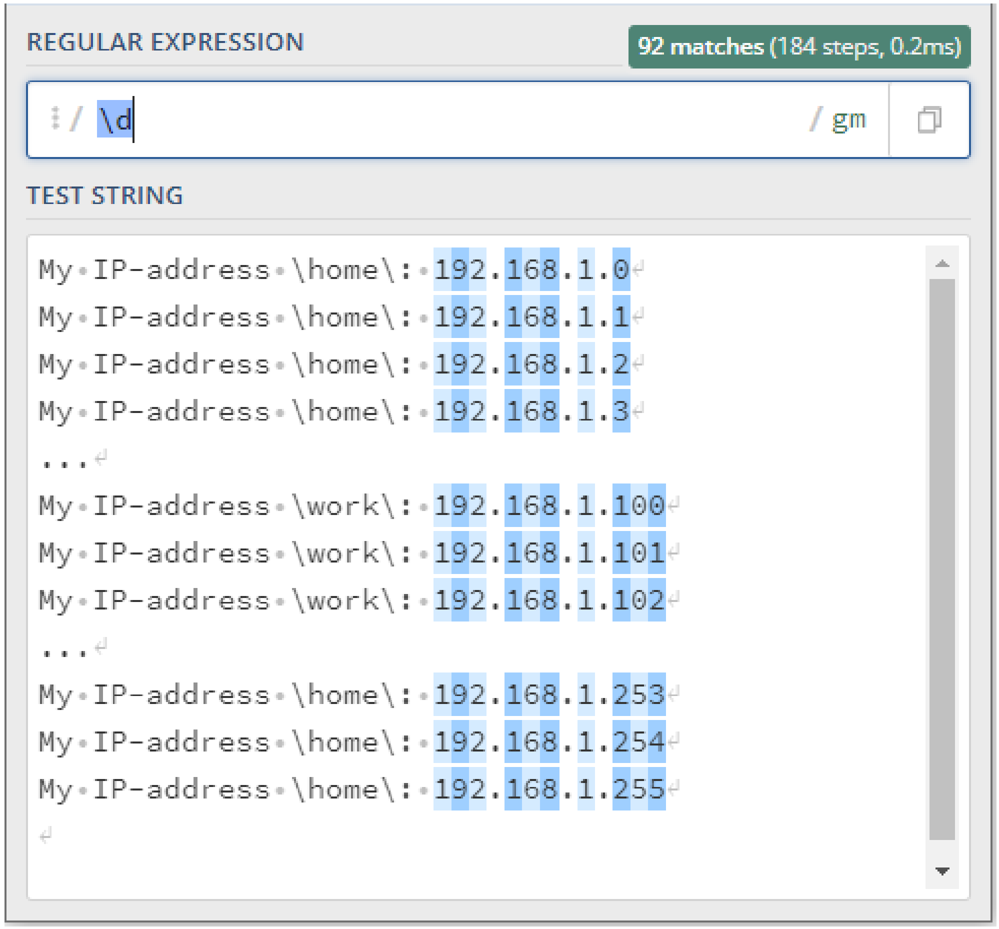
REGULAR EXPRESSION

348 matches (709 steps, 0.3ms)

```
/ . / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```



REGULAR EXPRESSION

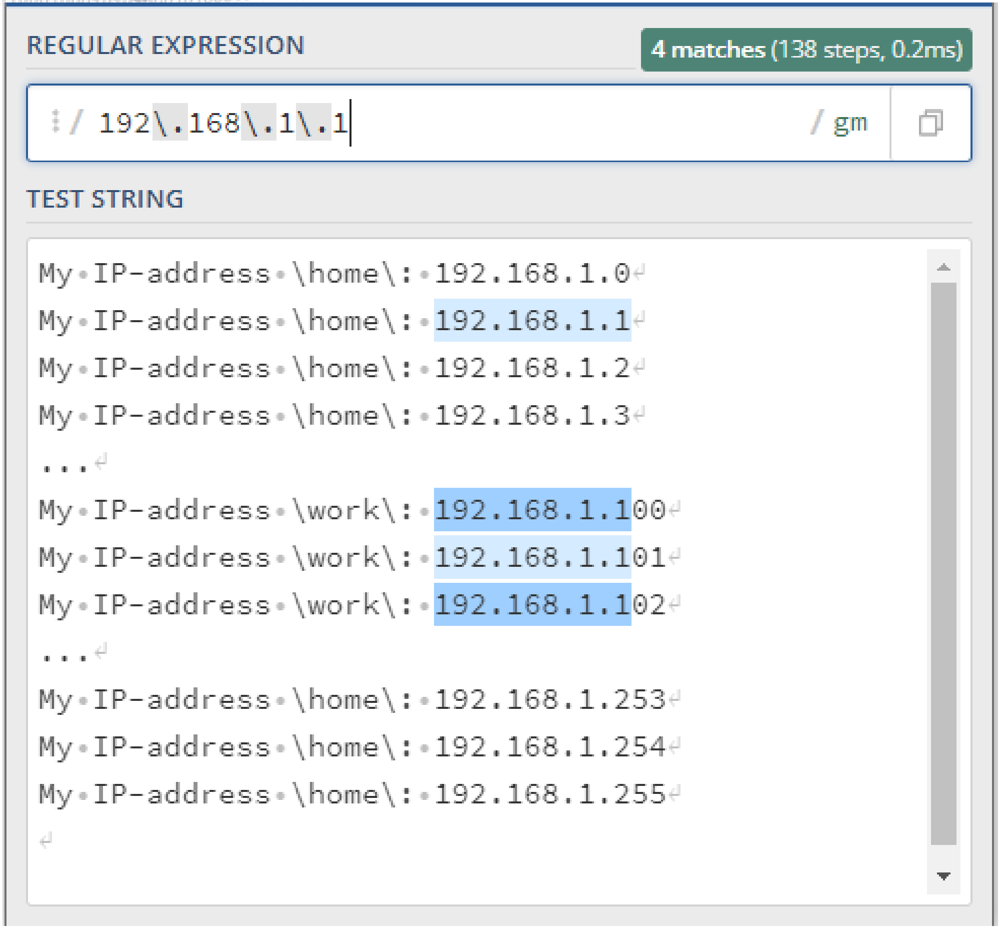
92 matches (184 steps, 0.2ms)

```
/ \d / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```

Примеры регулярных выражений

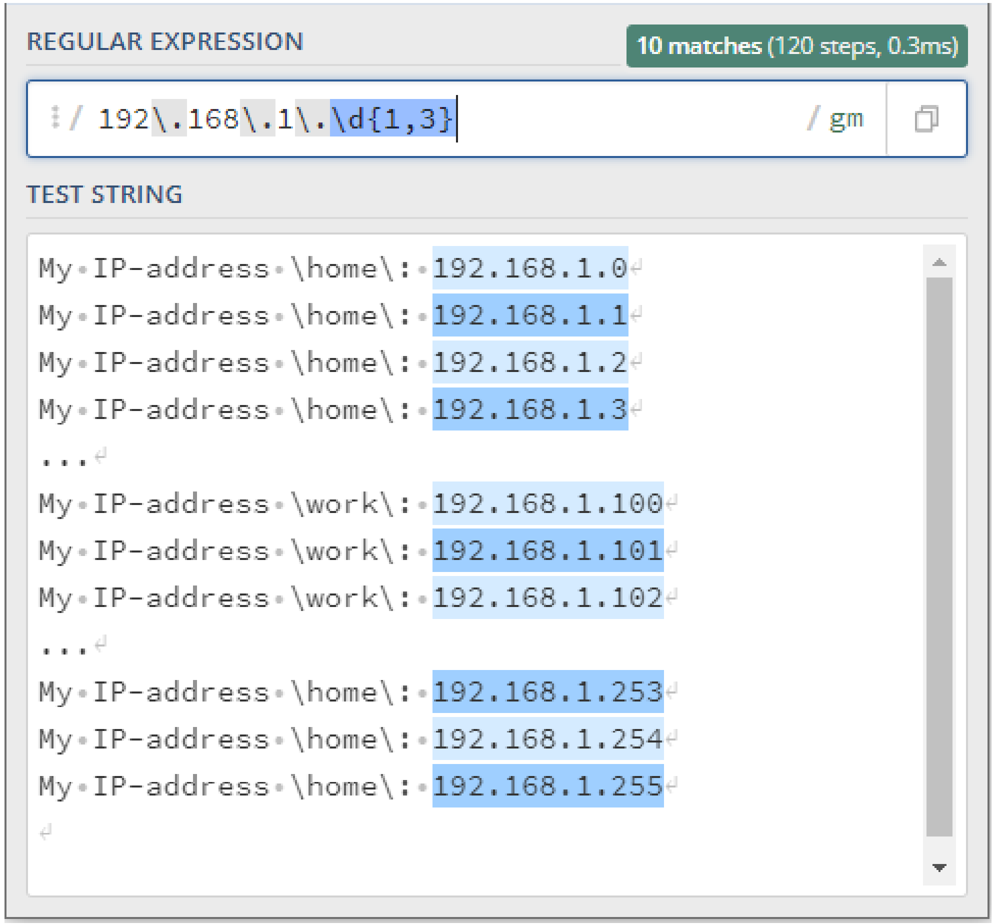


REGULAR EXPRESSION — 4 matches (138 steps, 0.2ms)

```
/ 192\.168\.1\.1 / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```



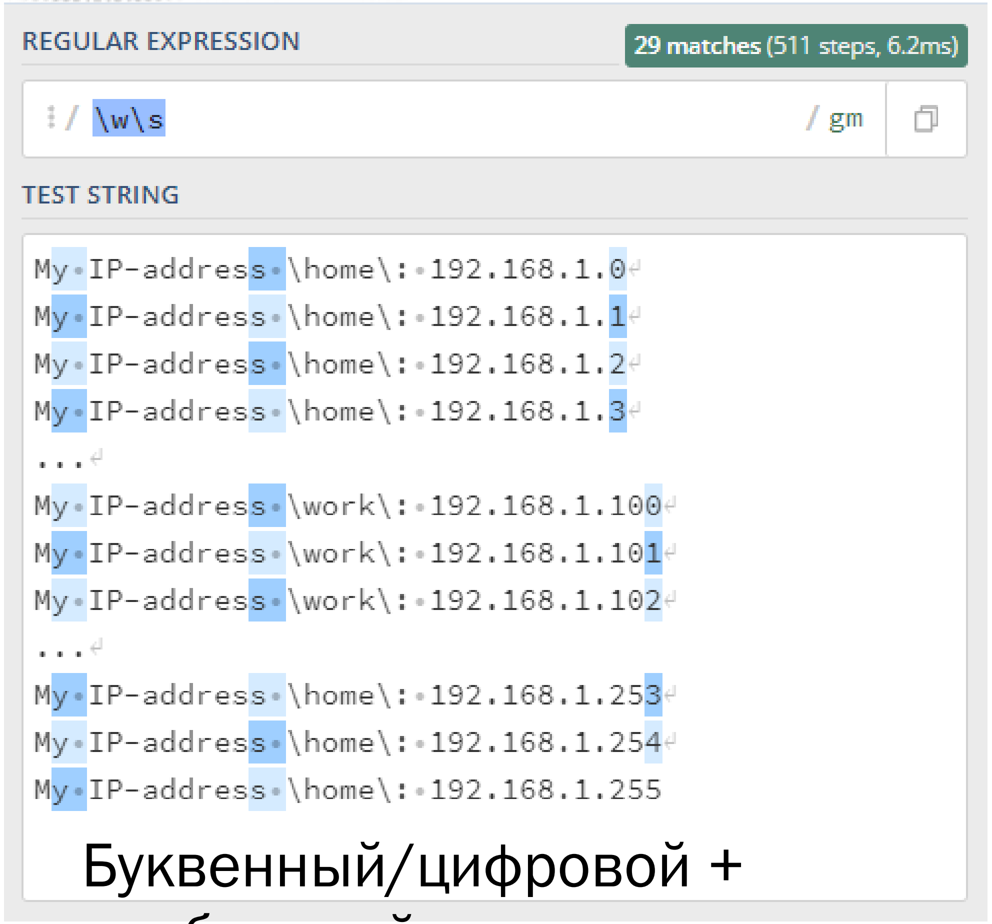
REGULAR EXPRESSION — 10 matches (120 steps, 0.3ms)

```
/ 192\.168\.1\.\d{1,3} / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```

Примеры регулярных выражений



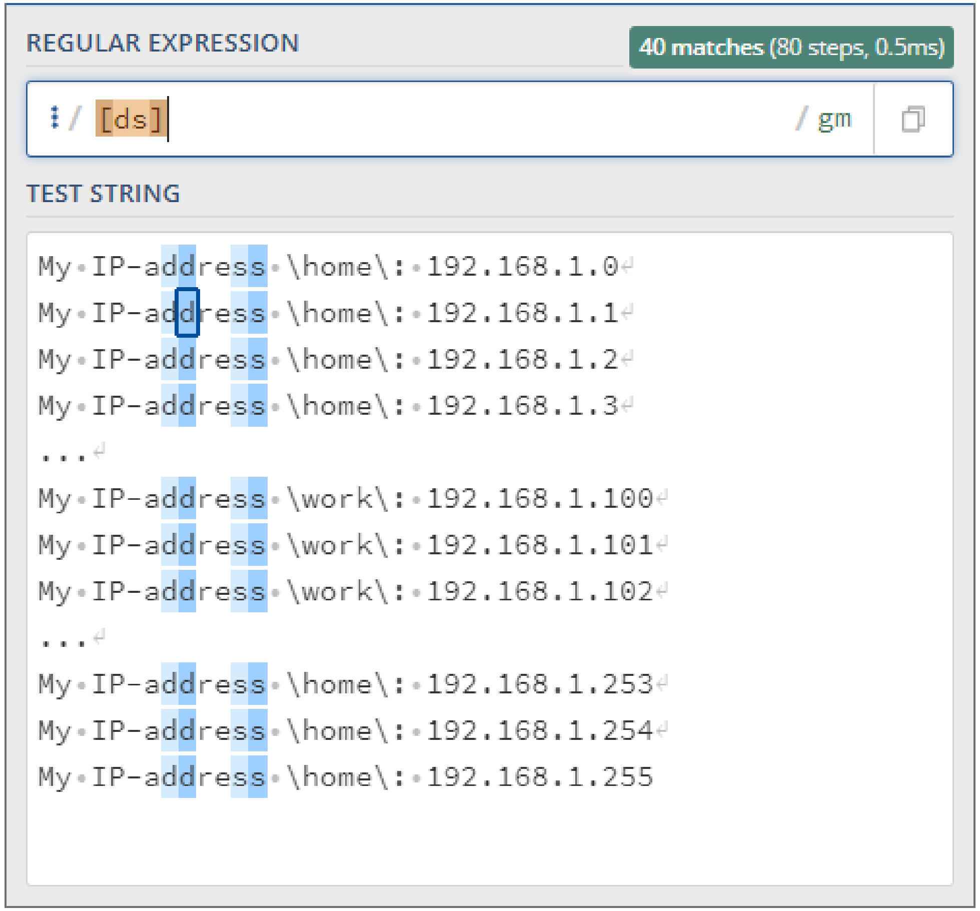
REGULAR EXPRESSION — 29 matches (511 steps, 6.2ms)

```
/ \w\s / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```

Буквенный/цифровой + пробельный символ



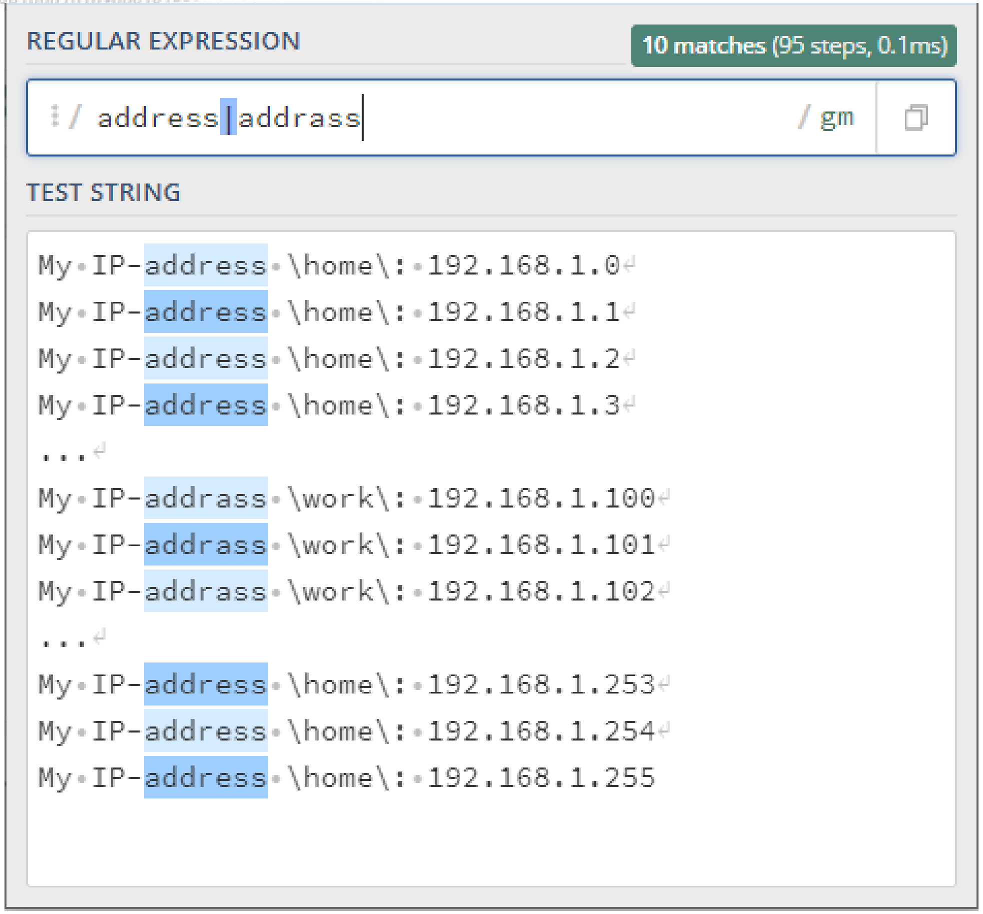
REGULAR EXPRESSION — 40 matches (80 steps, 0.5ms)

```
/ [ds] / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```

Примеры регулярных выражений

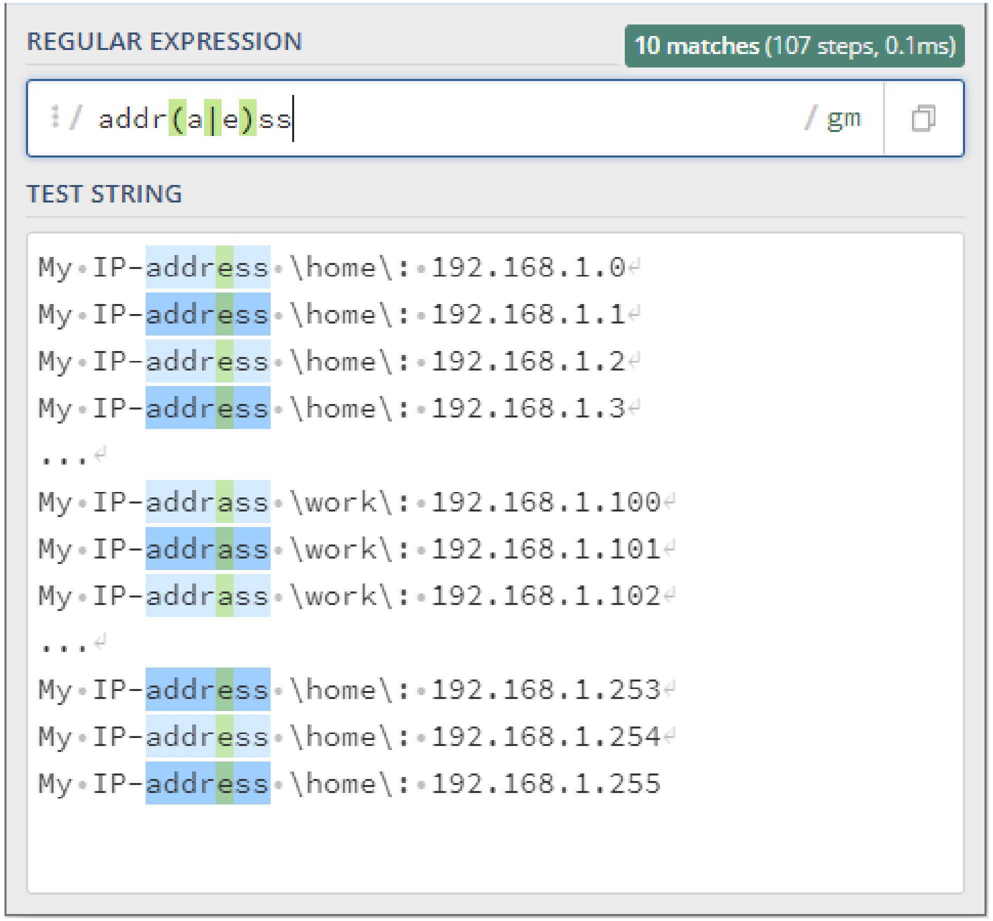


REGULAR EXPRESSION — 10 matches (95 steps, 0.1ms)

```
/ address|addrass / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-addrass \work\: 192.168.1.100
My IP-addrass \work\: 192.168.1.101
My IP-addrass \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```



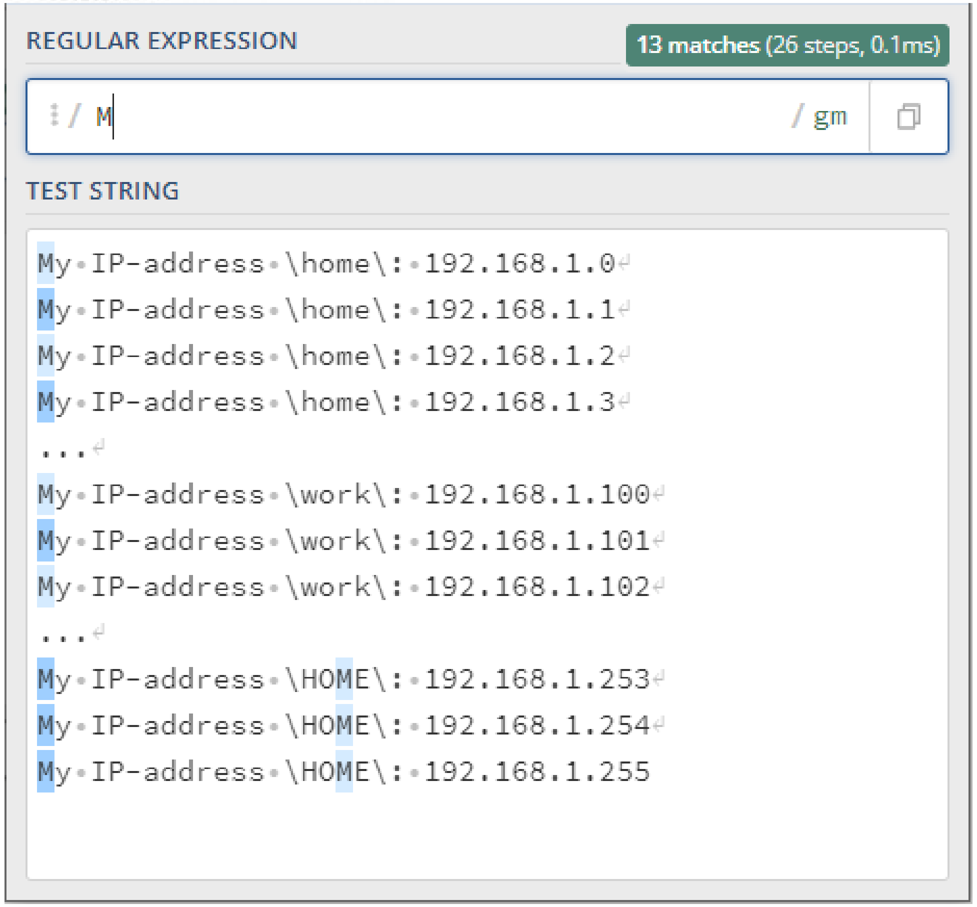
REGULAR EXPRESSION — 10 matches (107 steps, 0.1ms)

```
/ addr(a|e)ss / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-addrass \work\: 192.168.1.100
My IP-addrass \work\: 192.168.1.101
My IP-addrass \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```

Примеры регулярных выражений

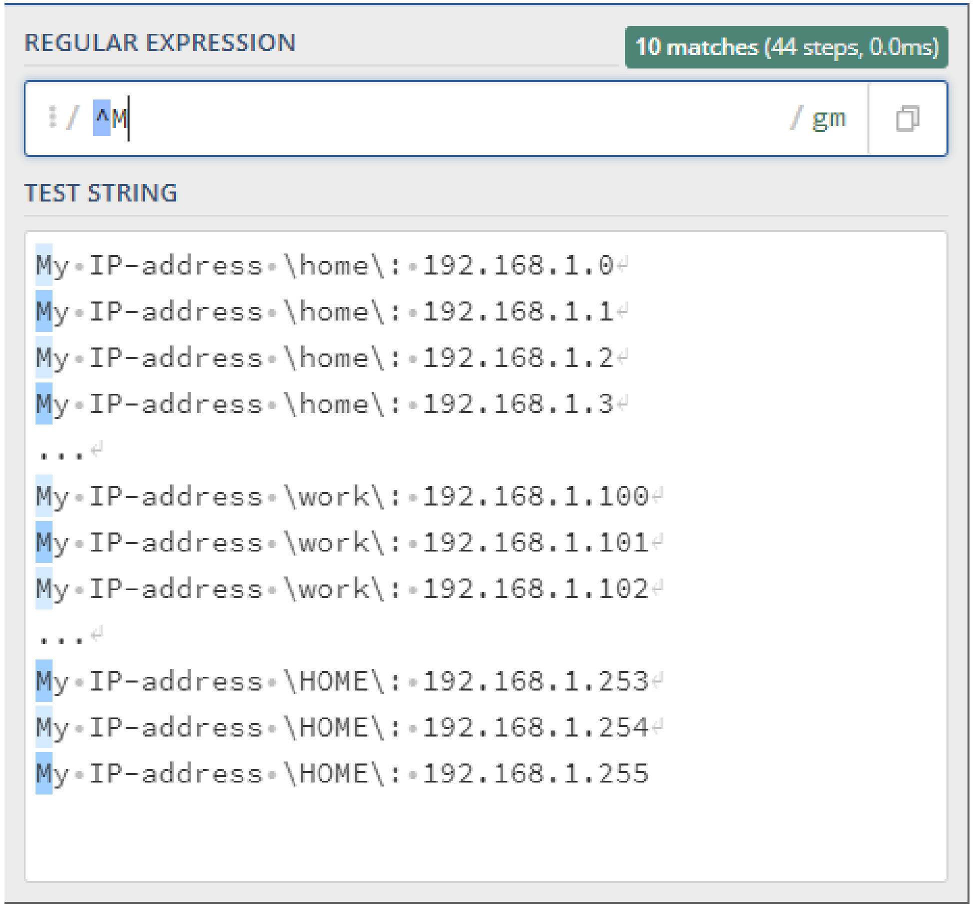


REGULAR EXPRESSION 13 matches (26 steps, 0.1ms)

```
/ M / gm
```

TEST STRING

```
My·IP-address·\home\:·192.168.1.0
My·IP-address·\home\:·192.168.1.1
My·IP-address·\home\:·192.168.1.2
My·IP-address·\home\:·192.168.1.3
...
My·IP-address·\work\:·192.168.1.100
My·IP-address·\work\:·192.168.1.101
My·IP-address·\work\:·192.168.1.102
...
My·IP-address·\HOME\:·192.168.1.253
My·IP-address·\HOME\:·192.168.1.254
My·IP-address·\HOME\:·192.168.1.255
```



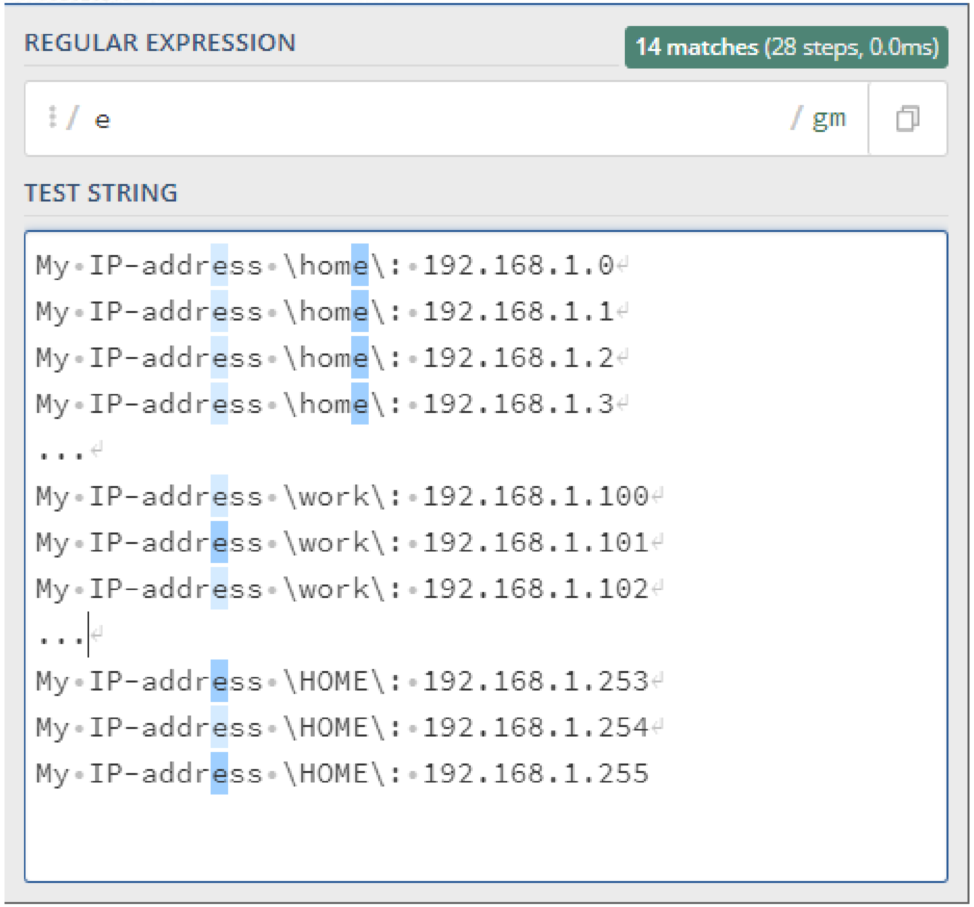
REGULAR EXPRESSION 10 matches (44 steps, 0.0ms)

```
/ ^M / gm
```

TEST STRING

```
My·IP-address·\home\:·192.168.1.0
My·IP-address·\home\:·192.168.1.1
My·IP-address·\home\:·192.168.1.2
My·IP-address·\home\:·192.168.1.3
...
My·IP-address·\work\:·192.168.1.100
My·IP-address·\work\:·192.168.1.101
My·IP-address·\work\:·192.168.1.102
...
My·IP-address·\HOME\:·192.168.1.253
My·IP-address·\HOME\:·192.168.1.254
My·IP-address·\HOME\:·192.168.1.255
```

Примеры регулярных выражений

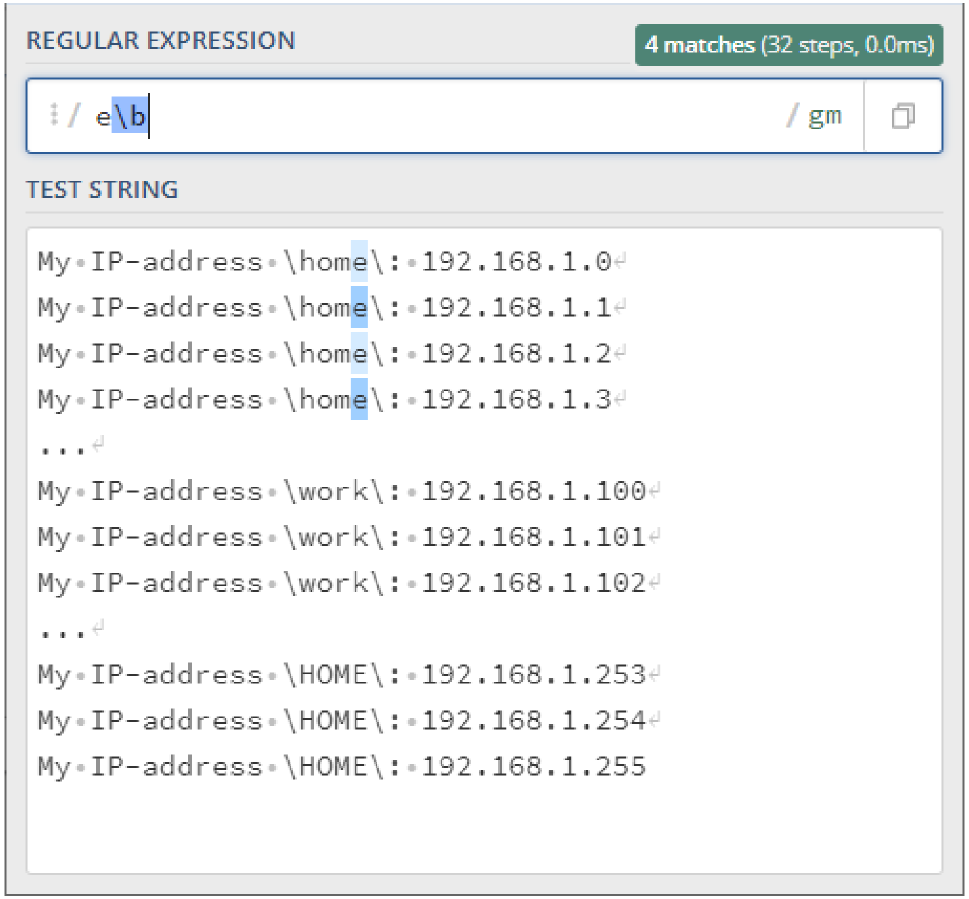


REGULAR EXPRESSION — 14 matches (28 steps, 0.0ms)

```
/ e / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \HOME\: 192.168.1.253
My IP-address \HOME\: 192.168.1.254
My IP-address \HOME\: 192.168.1.255
```



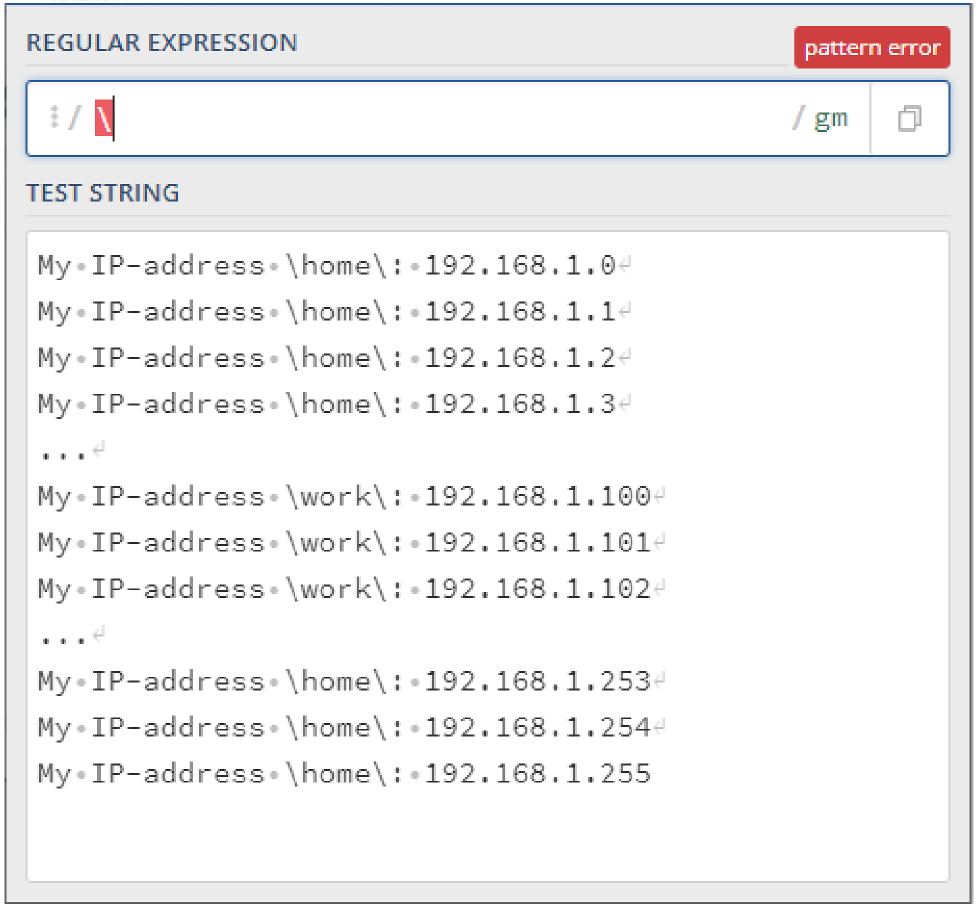
REGULAR EXPRESSION — 4 matches (32 steps, 0.0ms)

```
/ e\b / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \HOME\: 192.168.1.253
My IP-address \HOME\: 192.168.1.254
My IP-address \HOME\: 192.168.1.255
```

Примеры регулярных выражений

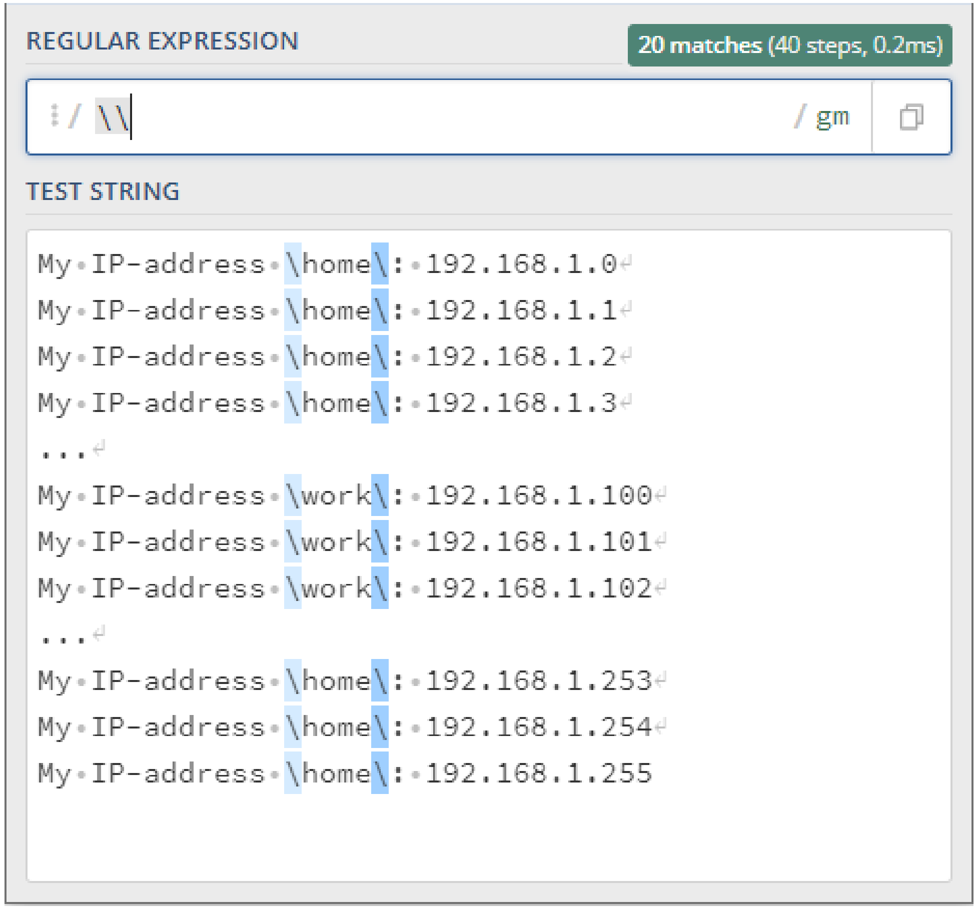


REGULAR EXPRESSION — pattern error

```
/ \ / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```



REGULAR EXPRESSION — 20 matches (40 steps, 0.2ms)

```
/ \\ / gm
```

TEST STRING

```
My IP-address \home\: 192.168.1.0
My IP-address \home\: 192.168.1.1
My IP-address \home\: 192.168.1.2
My IP-address \home\: 192.168.1.3
...
My IP-address \work\: 192.168.1.100
My IP-address \work\: 192.168.1.101
My IP-address \work\: 192.168.1.102
...
My IP-address \home\: 192.168.1.253
My IP-address \home\: 192.168.1.254
My IP-address \home\: 192.168.1.255
```

https://docs.python.org/3/library/re.html

```
import re
```

Основные причины использования:

- поиск в строке;
- разбиение строки на подстроки;
- замена части строки.

Функции в регулярных выражениях в Python

re.compile()

re.match()
re.search()
re.fullmatch()
re.findall()
re.split()
re.sub()
re.finditer()

Полезные ссылки

https://habr.com/ru/post/349860/ - Много примеров, заданий и объяснений