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Theory: Introduction to Python shell

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§1. What is the Python shell?

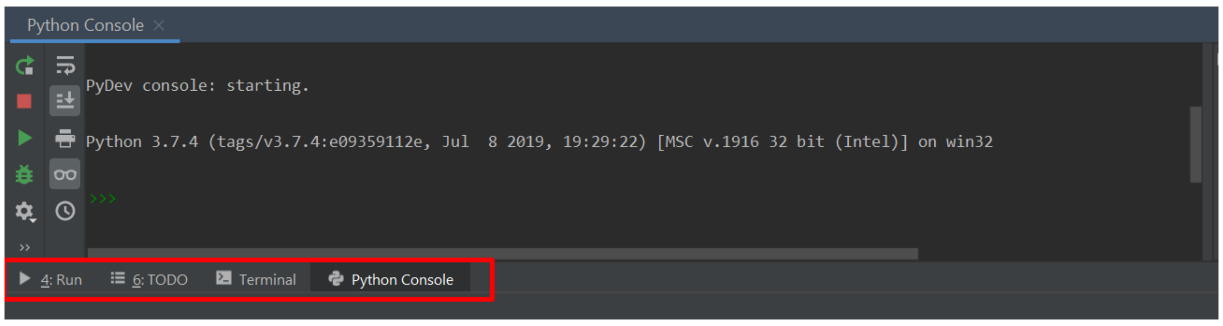
Once you installed Python, you can use it as an **interactive shell**. The interactive shell is a real-time Python interpreter. "Interactive" means that you can type here anything in Python syntax, press "Enter", and the shell will immediately print the result. It can be helpful for you if you are beginning to learn programming because with the help of the shell it's easier to review your code and find accidental errors: you can check it line by line.

Let's see how to start the Python shell and how we can use it.

§2. How to start

Starting the shell depends on your operating system. On Linux or macOS, you can simply start system shell, type "python" in it, and press "Enter". On Windows, it's the same action, but you might need to add a path to your executable file to the **PATH** system variable or type the full path to it in the console window. If you don't know how to do this, see examples.

Also, you might have IDLE in your system which is a simple graphic interface for Python shell. Try to search for it in your system. If you have already installed JetBrains PyCharm IDE, which we recommend, just click on "Python console" at the bottom of the PyCharm window:



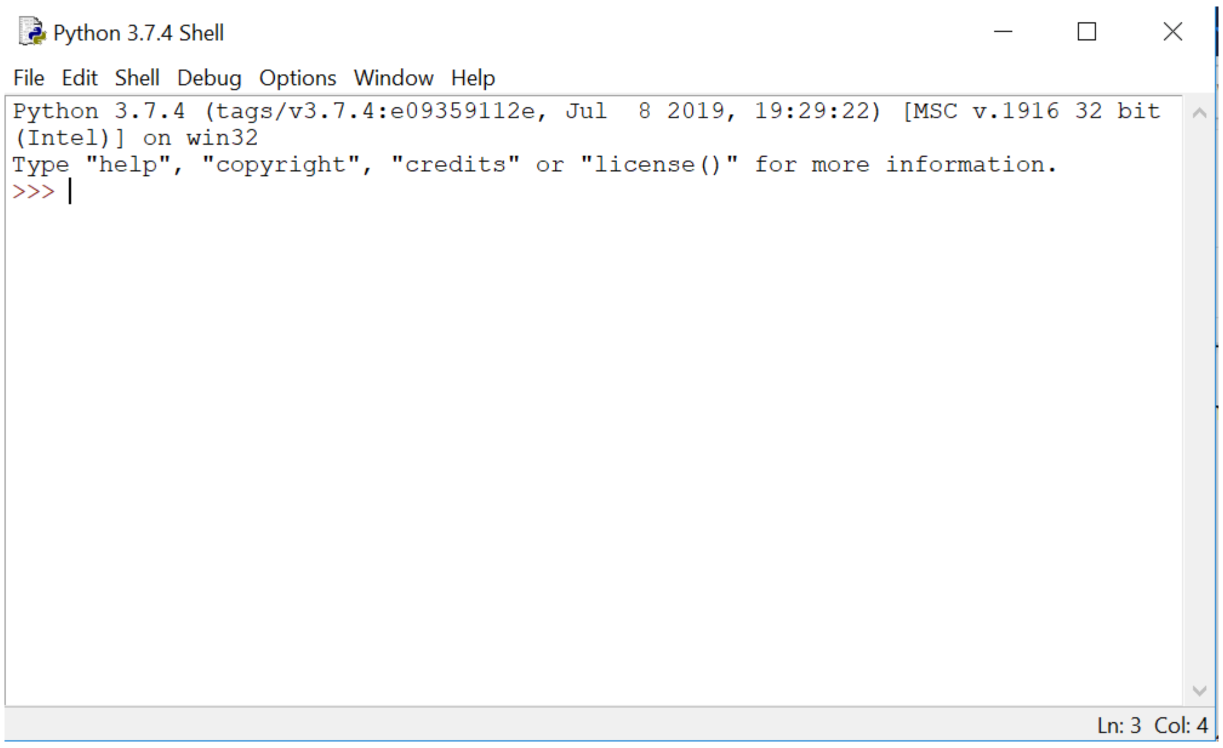
```
PyDev console: starting.

Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32

>>>
```

IDLE is good for beginners because you can also use it to run and edit your scripts. But usually, software developers use IDE, so it's better to install PyCharm, though the behavior is the same in any Python shell.

There is a screenshot below that shows how the Python shell window looks like.



```
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.
>>> |
```

If you run it from the command line, you can see the same Python shell, but inside the system shell:

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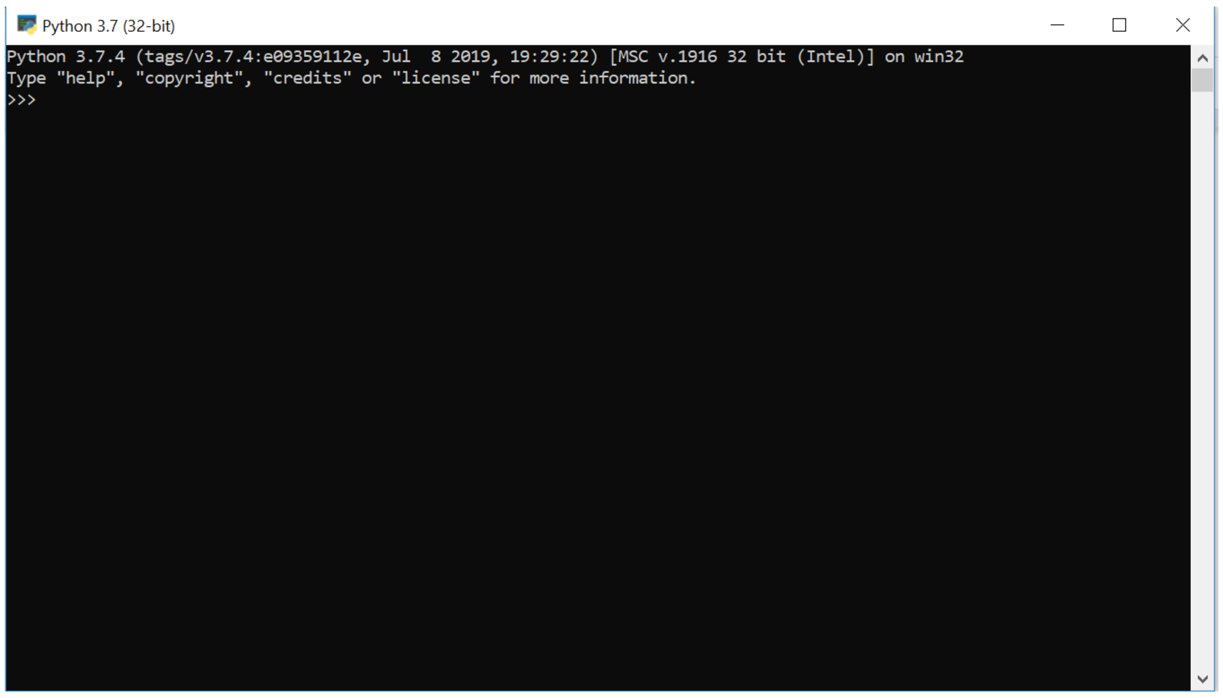


```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

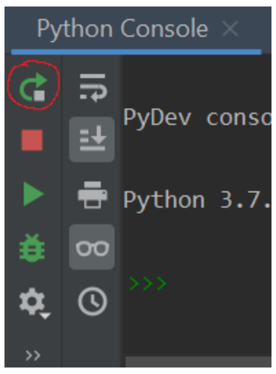
>>> means that shell is ready and you can use it. You can type any piece of code in Python syntax here, and the shell will execute it immediately.

To **leave** the interactive shell and get back to the console, press `Ctrl-Z` and then `Enter` on Windows, or `Ctrl-D` on OS X or Linux. Alternatively, you could also run the python commands `exit()` or `quit()`.

You may also want to **restart** the Python shell (if your program is not responding for some time, for example). In the shell opened in the command line, you just need to close the shell and open it once more. However, if you are working in IDLE or PyCharm, there are special commands to do so:

IDLE. *Shell --> Restart Shell* from the toolbar above or `Ctrl-F6`.

PyCharm. There's a reset button on the top left of the console that says "Rerun" at the toolbar:



§3. Simple programs

Let's try to write some code and see what happens in the shell. For example, you can use it as a simple calculator:

```
>>> 3 + 5 / 2
5.5
>>> (3 + 5) / 2
4.0
>>>
```

So, every time you type something after >>> and press "Enter", Python tries to execute it and shows the result. Sometimes you can get an error:

```
>>> 'a' + 3
Traceback (most recent call last):
  File "<pyshell#2>", line 1, in <module>
    'a' + 3
TypeError: can only concatenate str (not "int") to str
>>>
```

Don't be afraid. For now, if you see an error, and you're sure your code should work, simply double-check your code. Maybe there is a typo, and you just need to fix it.

In the example above, we're trying to concatenate a number and a string, which is not allowed in Python. We can solve it in two ways:

```
>>> 'a' + '3'
'a3'
>>> 1 + 3
4
>>>
```

See, if we try to sum two strings, we get a new string which contains both of the previous. It's a **concatenation**. But if we try to add two numbers we get their sum.

You can use more complicated math operations or concatenate letters to words and words to sentences.

§4. Conclusion

When you learn Python, it's useful to check every line of the code that you meet in this course. It will help you to understand how Python works, so don't hesitate to try examples from the course and modify them with your own values. The shell is a good thing for it because you won't break anything: once you close or restart the shell, everything you've done there disappears.

As you can already see, Python shell is a very useful tool for a programmer, and we will get back to it later to tell you about even more opportunities it provides.

Report a typo

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