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Top 5 Python IDEs For Data Science

The best Python IDEs for data science that make data analysis and machine learning easier!

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IDE stands for Integrated Development Environment. It's a coding tool which allows you to write, test, and debug your code in an easier way, as they typically offer code completion or code insight by highlighting, resource management, debugging tools, ... And even though the IDE is a strictly defined concept, it's starting to be redefined as other tools such as notebooks start gaining more and more features that traditionally belong to IDEs. For example, debugging your code is also possible in Jupyter Notebook.

You can probably most clearly see this evolution in the results of the [Stack Overflow Developer Survey](#) below, which also includes these new tools, next to the traditional IDEs that you might already know; They all fall under the section “development environment”.

Because of all the features that IDEs have to offer, they are extremely useful for development: they make your coding more comfortable and this is no different for data science. However, given the fact that there aren't only the traditional IDEs to consider, but also new tools, such as notebooks, you might be wondering which development environment to use when you're just starting out with data science.

IDEs Versus Text Editors



data science IDE

The truth is that you can code in almost any software, from prompt command to Windows notepad, but you may also want a proper programming environment which combines coding facility with a debugging environment.

So why would or do you choose a traditional IDE instead of, for example, a notepad?

The answer would be practicality. For instance, imagine that you are coding in any text editor like Windows notepad. When your code is ready, you'll need to run it.

You can't execute your program in a text editor like this, so you must use a prompt command to do it. Rather than use two different programs, wouldn't better have it all in just one place? That's what an IDE is ready for.

But, take a closer look at the image above. Notepad++, which is a text editor in its essence, is one of the tools most used by Stack Overflow community.

Isn't that weird?

Well, many text editors can be used as a development environment if you make use of plugins: when you're working with Notepad++, for example, you can use these plugins such as the [DBGP for Notepad++](#) to install a debugger in the application, allowing you to run and analyze your code directly in your favorite text editor.

And this immediately explains why text editors can be so popular: they not only offer you the blank slate, but they also give you the option to add features that you might need. This stands in clear contrast with IDEs such as Visual Studio and Spyder, where these features are built in and you don't need to install anything else to start developing, but where the learning curve might be a little bit steeper for users.



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The Top 5 Development Environments

Creating a list with just five development environments for data science with Python is a hard task: you might not only want to consider the possible learning curve, price or built-in/downloadable features, but you also might want to take into account the possibility to visualize and report on your results, or how easy a certain the environment is to collaborate with others.

You'll see that your choice will balance all of these things and that the *'best'* development environment for you will be the one which makes your life easier and your work more comfortable. This means that you could potentially also switch between IDE, notebook and text editor according to whatever is more useful for you!

That's why it's best to see this list as a guide of software to test before you pick your favorite.

Spyder

Python IDE for data science

If you have the Anaconda distribution installed on your computer, you probably already know Spyder. It's an open source cross-platform IDE for data science. If you have never worked with an IDE, Spyder could perfectly be your first approach. It integrates the essentials libraries for data science, such as NumPy, SciPy, Matplotlib and IPython, besides that, it can be extended with plugins.

You should try it out because... Different of most of IDEs around the web, Spyder was built specifically for data science. It may not be as charming as another IDEs such as Visual Studio or Atom, but give it a try! The learning curve is so smooth that you will master it in a blink of an eye. If you are a beginner, you'll like to use features like the online help, which allows you to search for specific information about libraries.

Note also how this interface is quite similar to RStudio; That's why, if you're switching between Matlab or R to Python, this is the way to go.

Features Spyder contains features like a text editor with syntax highlighting, code completion and variable exploring, which you can edit its values using a Graphical User Interface (GUI).

Data science enthusiasts say...



“If you are switching from Matlab or Rstudio to Python; Spyder is the way to go, It very intuitive for scientific computing.”

Download Spyder is free and it's available for Windows, MacOS and major Linux distributions, like Debian, Fedora, and Ubuntu. You can install Spyder by [downloading Anaconda](#) on Continuum's website.

PyCharm



PyCharm is an IDE made by the folks at JetBrains, a team responsible for one of the most famous Java IDE, the IntelliJ IDEA.

You should try it out because... PyCharm is perfect for those who already have experience using another JetBrains' IDE, due to the fact that the interface and features be similar. Also, if you like IPython or Anaconda distribution, it's nice for you to know that PyCharm integrates its tools and libraries such as NumPy and Matplotlib, allowing you work with array viewers and interactive plots.

In addition to Python, PyCharm provides support for JavaScript, HTML/CSS, Angular JS, Node.js, and so on, what makes it a good option for web development.

Features Just like other IDEs, PyCharm has interesting features such as a code editor, errors highlighting, a powerful debugger with a graphical interface, besides of Git integration, SVN, and Mercurial. You can also customize your IDE, choosing between different themes, color schemes, and key-binding. Additionally, you can expand PyCharm's features by adding plugins; You can take a look at the PyCharm Plugins Library [here](#).

Data science enthusiasts say...

“I have tried most of the popular IDE's for Python and hands down the best one in my opinion is PyCharm. It has a very nice debugger, plays nicely with git, and works easily with the use of multiple Python versions with virtualenv. Reindexing is relatively fast, and I like

the interface. The community version is free and does not at all feel like it is lacking.”

Download You can download the Lightweight PyCharm IDE for Python and scientific development for free [here](#). It's available for free for Windows, macOS, and Linux.

Thonny



The next IDE is Thonny: an IDE for learning and teaching programming. It's a software developed at The University of Tartu, which you can download for free on [the Bitbucket repository](#) for Windows, Linux, and Mac.

Among its features, Thonny supports code completion and highlight syntax errors, but it also provides a simple debugger, which you can run your program step-by-step. This is very nice for beginners, as they can step through statements and expressions. While editing a function, a new window is opened with local variables and the code being shown separately from your main code. The purpose of Thonny is to give you a good understanding of how Python works under the hood.

Atom



An open source text editor developed by Github. That sounds great, right?

That's exactly what Atom is.

You should try it out because... Although this text editor is available for many popular programming languages such as Ruby on Rails, PHP, Java and so on, Atom has interesting features that create a good experience for Python developers.

Features One of the best advantages of Atom is its community, chiefly due to the constants enhancements and plugins that they develop in order to customize your IDE and improve your workflow.

For instance, One of these plugins - called “Packages” - is the [Data Atom](#), which allows you to write and execute SQL queries. It supports PostgreSQL, Microsoft SQL Server, and MySQL. Besides that, you can also visualize your results on Atom, without open any other window. Additionally, you also have a plugin called “Markdown Preview Plus”, which provides you with built-in support for editing and visualizing Markdown files and which allows you to open a preview, render LaTeX equations, and much more!

As you could have already expected, Atom's integration with git is awesome. And, as other IDEs, it allows you to use multiples panes, themes, and colors, managing multiples projects.

Do you want to know one of the downsides? Atom might have a weak performance on older CPUs.

Data science enthusiasts say...

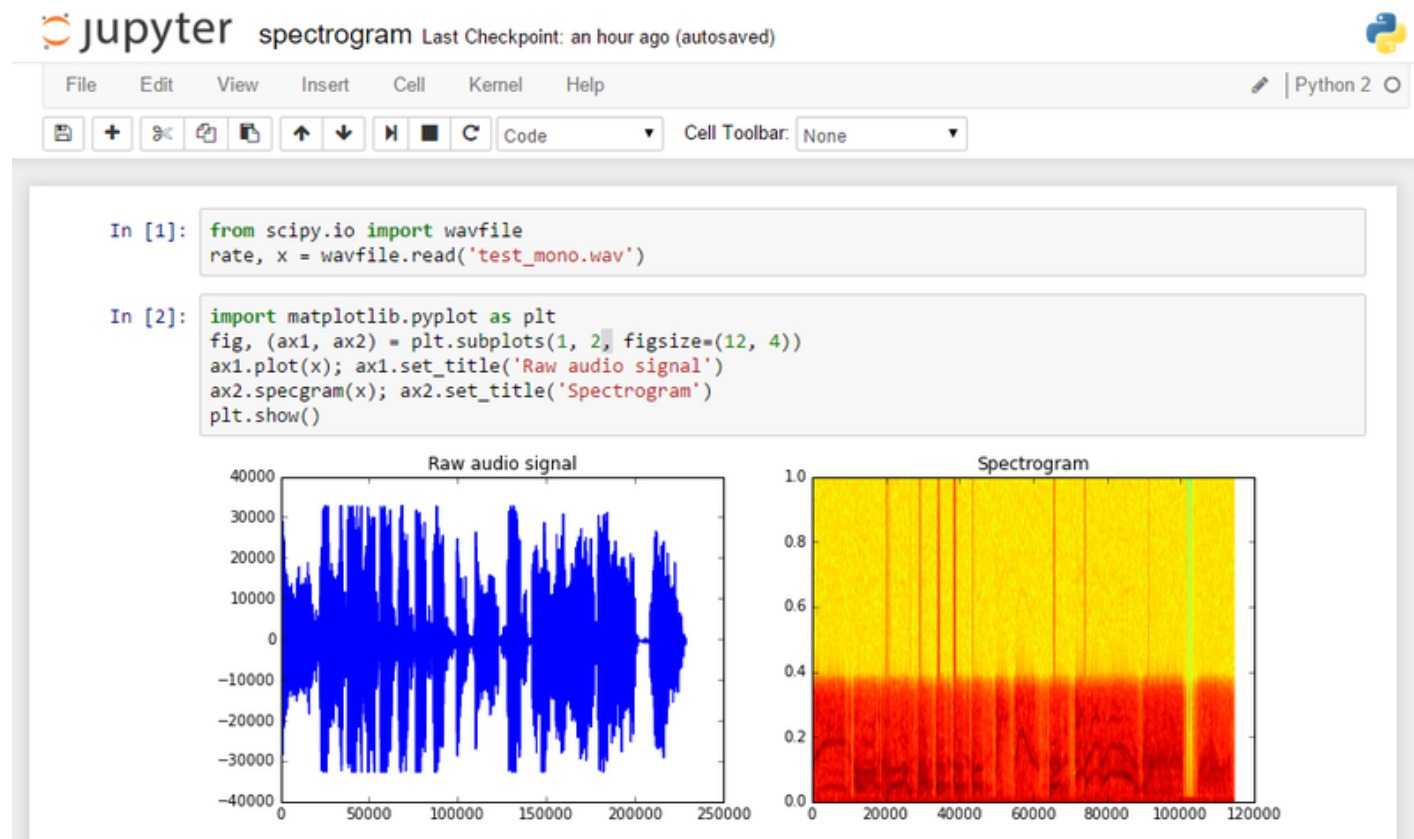


"I'm using hydrogen for Atom, it's very fast and useful, it's worthwhile try out. [...] Very recommended."

Tip Use Atom in combination with [Hydrogen](#), a package that lets you run your code directly in Atom using any Jupyter kernels you have installed.

Download Based in Electron - also known as Atom Shell, a cross-platform desktop applications framework by using Chromium -, Atom is available for free for Windows, OS X, and Linux. You can download it clicking [here](#)!

Jupyter Notebook



Jupyter Notebook was born out of IPython in 2014. It is a web application based on the server-client structure, and it allows you to create and manipulate notebook documents – or just “notebooks”.

You should try it out because... Jupyter Notebook provides you with an easy-to-use, interactive data science environment across many programming languages that

doesn't only work as an IDE, but also as a presentation or education tool. It's perfect for those who are just starting out with data science!

Features The Jupyter Notebook supports markdowns, allowing you to add HTML components from images to videos. Thanks to Jupyter, you can easily see and edit your code in order to create compelling presentations. For instance, you can use data visualization libraries like Matplotlib and Seaborn and show your graphs in the same document where your code is. Besides all of this, you can export your final work to PDF and HTML files, or you can just export it as a .py file. In addition, you can also create blogs and presentations from your notebooks. If you want to know more about the features that Jupyter has to offer to you, check out [this article](#).

Data science enthusiasts say...



“Jupyter Notebook should be an integral part of any Python data scientist’s toolbox. It’s great for prototyping and sharing notebooks with visualizations.”

Tip If you want to know everything about the Jupyter Notebook, the installation process and how to get started with this tool, check out [this tutorial](#) that will guide you through this awesome data science tool.

Download Jupyter Notebook is easy to install and easier to use. You can download it [here](#).

Other IDE Alternatives To Consider

What's the best IDE for you?

The answer is simple: that one which makes your life easier and your work more comfortable.

The purpose of this list is to give you good references to start off. You can test each one and give your considerations about what it's good and bad at. In addition to that, you can try some alternatives, and maybe you'll even find them better than the ones that are put in the top 5!



nteract IDE

For instance, nteract could be a good alternative for those who are looking to focus more on writing a code-driven story. nteract is a desktop application that allows

you to create notebooks just like Jupyter Notebook. You already see: instead of working in the browser like with Jupyter, you actually download nteract and execute the application to be able to develop beautiful documents with code, words, and images. With this installation procedure, you have a terminal-free experience, which could be even better if you're new to coding.

Accessible for beginners is key to the features that you'll find in nteract: you can execute cells, just like in Jupyter Notebook, but you can also move them around by dragging and dropping them. You can also pin cells to the top of the notebook, which stick there as you scroll through the document.

It's available for Windows, Mac, and Linux, besides of support `ipynb` files - IPython notebooks. You can download nteract.io [here](#).



Another alternative could be the Visual Studio Code. This is a text editor developed by Microsoft, but which can also be used as an IDE. One good thing about Visual Studio is its Git integration. Like Atom, you can commit, sync and create branches in your repositories easily with this application.

Visual Studio contains a feature called IntelliSense, which provides code completions based on variable types, functions and imported modules. It also provides syntax highlighting and autocomplete function.

You can download Visual Studio Code for Windows, Linux or macOS for free on [this page](#).



As a third alternative option, you could also consider Sublime Text, a powerful text editor. Most people love it for the user interface, the extraordinary features, and performance. Just like with the other text editors that were mentioned above, you can extend Sublime Text with plugins. Check out [this page](#) for more information on how to set up Sublime Text to be a light-weight all-in-one data science IDE.

You can download Sublime Text [here](#).

Conclusion

IDEs surely can help you to improve your workflow and make your results profitable. You can write, execute and debug your code easily, aside from customizing windows and colors. Instead of a traditional IDE, you can also try a text editor like Notepad++, but keep in mind that you'll need to expand it by using plugins (such as PyNPP) if you want to execute your code.

Image credits:

- [https://en.wikipedia.org/wiki/Spyder_\(software\)](https://en.wikipedia.org/wiki/Spyder_(software))

- <https://datayo.wordpress.com/2015/06/23/pycharm-python-ide-for-data-scientist/>
- <https://atom.io/packages/hydrogen>
- <https://docs.microsoft.com/en-us/azure/virtual-machines/linux/jupyter-notebook>
- <https://nteract.io>
- <https://blog.miguelgrinberg.com/post/visual-studio-code-for-python-developers>
- <https://www.linkedin.com/pulse/sublime-text-your-all-in-one-data-science-ide-eric-wei>
- <http://thonny.org>

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