

Introduction to Programming with Python

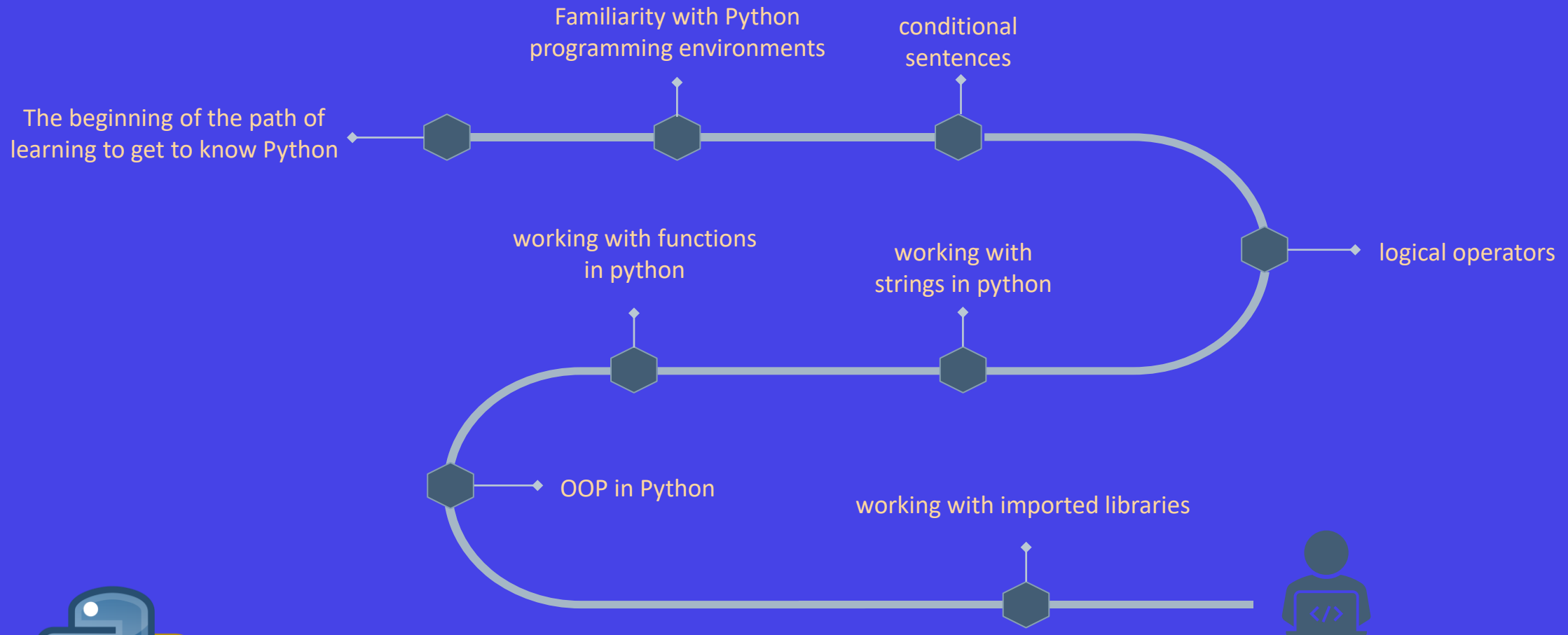
Amin Sakhaei
Pouya Taghipour

Amirkabir University of Technology
Department of Biomedical Engineering

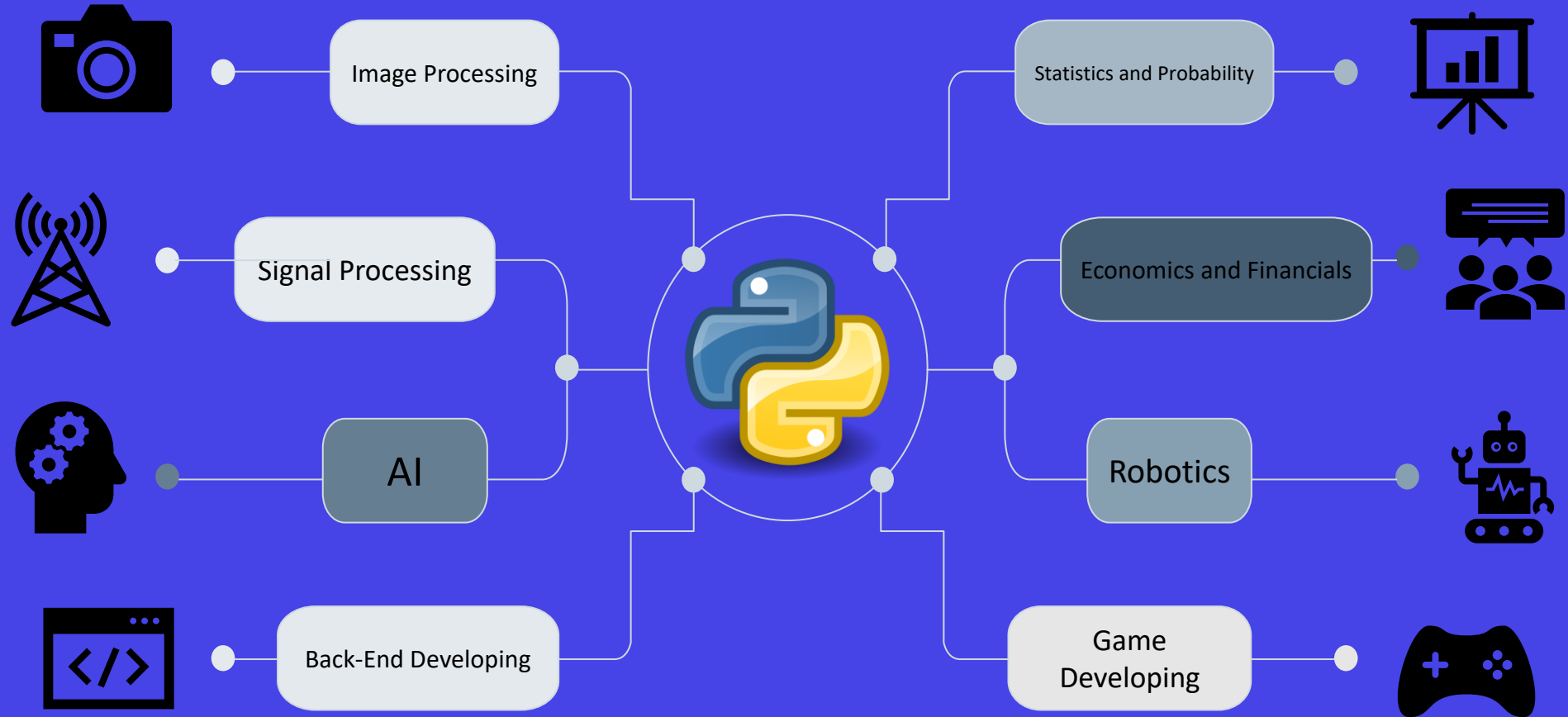
Summer 2023



Course Outline



Why Learn Python?



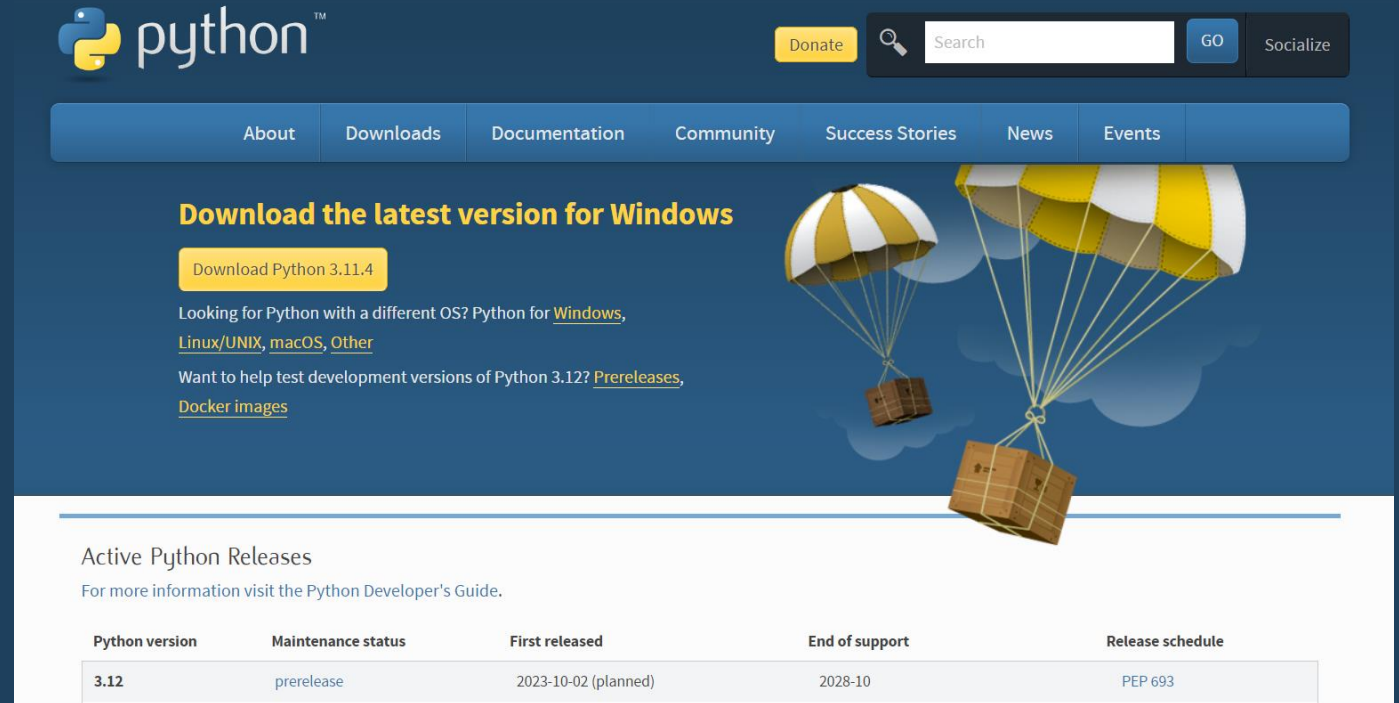
Installing Python

Open source

Windows

MacOS

Linux



The screenshot shows the Python.org website. At the top is the Python logo and a navigation bar with links: About, Downloads, Documentation, Community, Success Stories, News, and Events. To the right of the navigation bar are a 'Donate' button, a search bar with a 'GO' button, and a 'Socialize' button. The main content area features a large heading 'Download the latest version for Windows' and a yellow button labeled 'Download Python 3.11.4'. Below this, there is text linking to Python for other operating systems: 'Looking for Python with a different OS? Python for [Windows](#), [Linux/UNIX](#), [macOS](#), [Other](#)'. Further down, it mentions development versions: 'Want to help test development versions of Python 3.12? [Prereleases](#), [Docker images](#)'. To the right of the text is an illustration of two parachutes carrying boxes. At the bottom of the page, there is a section titled 'Active Python Releases' with a link to the 'Python Developer's Guide'. Below this is a table with the following data:

Python version	Maintenance status	First released	End of support	Release schedule
3.12	prerelease	2023-10-02 (planned)	2028-10	PEP 693

What is the Programming Environment?



ANACONDA[®]

Installing Anaconda

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Open source

Windows

MacOS

Linux

Anaconda Distribution

Free Download

Everything you need to get started in data science on your workstation.


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 Learning

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Anaconda Notebooks new!

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



A Full Python IDE directly from the browser

[Documentation](#)

[Anaconda Blog](#)



All applications on base (root) Channels

 <p>DataSpell</p> <p>DataSpell is an IDE for exploratory data analysis and prototyping machine learning models. It combines the interactivity of Jupyter notebooks with the intelligent Python and R coding assistance of PyCharm in one user-friendly environment.</p> <p>Install</p>	 <p>CMD.exe Prompt</p> <p>0.1.1</p> <p>Run a cmd.exe terminal with your current environment from Navigator activated</p> <p>Launch</p>	 <p>JupyterLab</p> <p>3.5.3</p> <p>An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.</p> <p>Launch</p>	 <p>Notebook</p> <p>6.5.2</p> <p>Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.</p> <p>Launch</p>	 <p>Powershell Prompt</p> <p>0.0.1</p> <p>Run a Powershell terminal with your current environment from Navigator activated</p> <p>Launch</p>	 <p>PyCharm Professional</p> <p>2023.1.3</p> <p>A Full-fledged IDE by JetBrains for both Scientific and Web Python development. Supports HTML, JS, and SQL.</p> <p>Launch</p>
 <p>Qt Console</p> <p>5.4.0</p> <p>PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.</p> <p>Launch</p>	 <p>Spyder</p> <p>5.4.1</p> <p>Scientific PYTHON Development Environment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection Features</p> <p>Launch</p>	 <p>VS Code</p> <p>1.80.1</p> <p>Streamlined code editor with support for development operations like debugging, task running and version control.</p> <p>Launch</p>	 <p>Datalore</p> <p>Kick-start your data science projects in seconds in a pre-configured environment. Enjoy coding assistance for Python, SQL, and R in Jupyter notebooks and benefit from no-code automations. Use Datalore online for free.</p> <p>Launch</p>	 <p>IBM Watson Studio Cloud</p> <p>IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools or visual modeling.</p> <p>Launch</p>	 <p>ORACLE Cloud Infrastructure</p> <p>Oracle Data Science Service</p> <p>OCI Data Science offers a machine learning platform to build, train, manage, and deploy your machine learning models on the cloud with your favorite open-source tools</p> <p>Launch</p>
 <p>console_shortcut_miniconda</p> <p>0.1.1</p>	 <p>Glueviz</p> <p>1.2.4</p> <p>Multidimensional data visualization across files. Explore relationships within and</p>	 <p>Orange 3</p> <p>3.34.0</p> <p>Component based data mining framework. Data visualization and data analysis for</p>	 <p>powershell_shortcut_miniconda</p> <p>0.0.1</p>	 <p>RStudio</p> <p>1.1.456</p> <p>A set of integrated tools designed to help you be more productive with R. Includes R</p>	

Installing VSC

Open source

Windows

MacOS

Linux

 Visual Studio Code Docs Updates Blog API Extensions FAQ Learn

 Search Docs

 Download

[Version 1.81](#) is now available! Read about the new features and fixes from July.

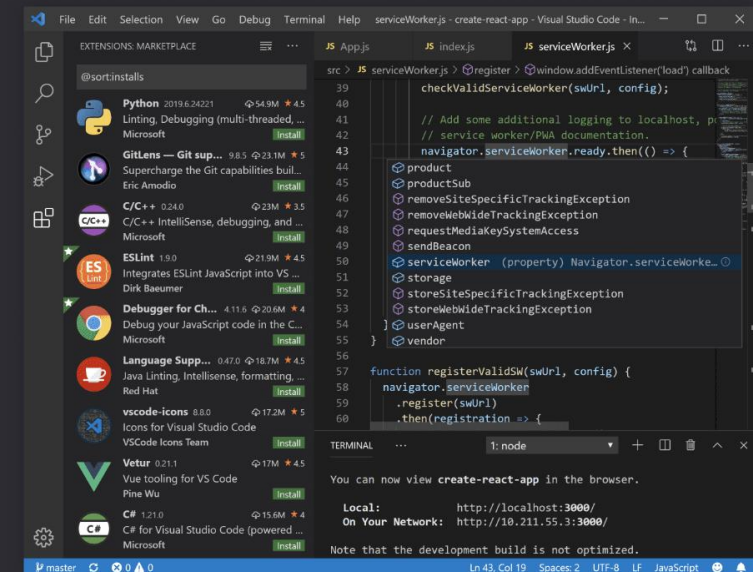
Code editing. Redefined.

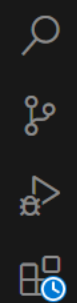
Free. Built on open source. Runs everywhere.

Download for Windows
Stable Build

Web, Insiders edition, or other platforms

By using VS Code, you agree to its
license and privacy statement.









Visual Studio Code

Editing evolved


Start

-  New File...
-  Open File...
-  Open Folder...
-  Connect to...

Recent





You have no recent folders, [open a folder](#) to start.

Recommended



GitHub Copilot
Supercharge your coding experience for as little as \$10/month with cutting edge AI code generation.

Walkthroughs

-  Learn the Fundamentals
-  Boost your Productivity
-  Get Started with Python Development **Updated**
-  Get Started with Jupyter Notebooks **Updated**

[More...](#)



☒ Show welcome page on startup

Installing PyCharm

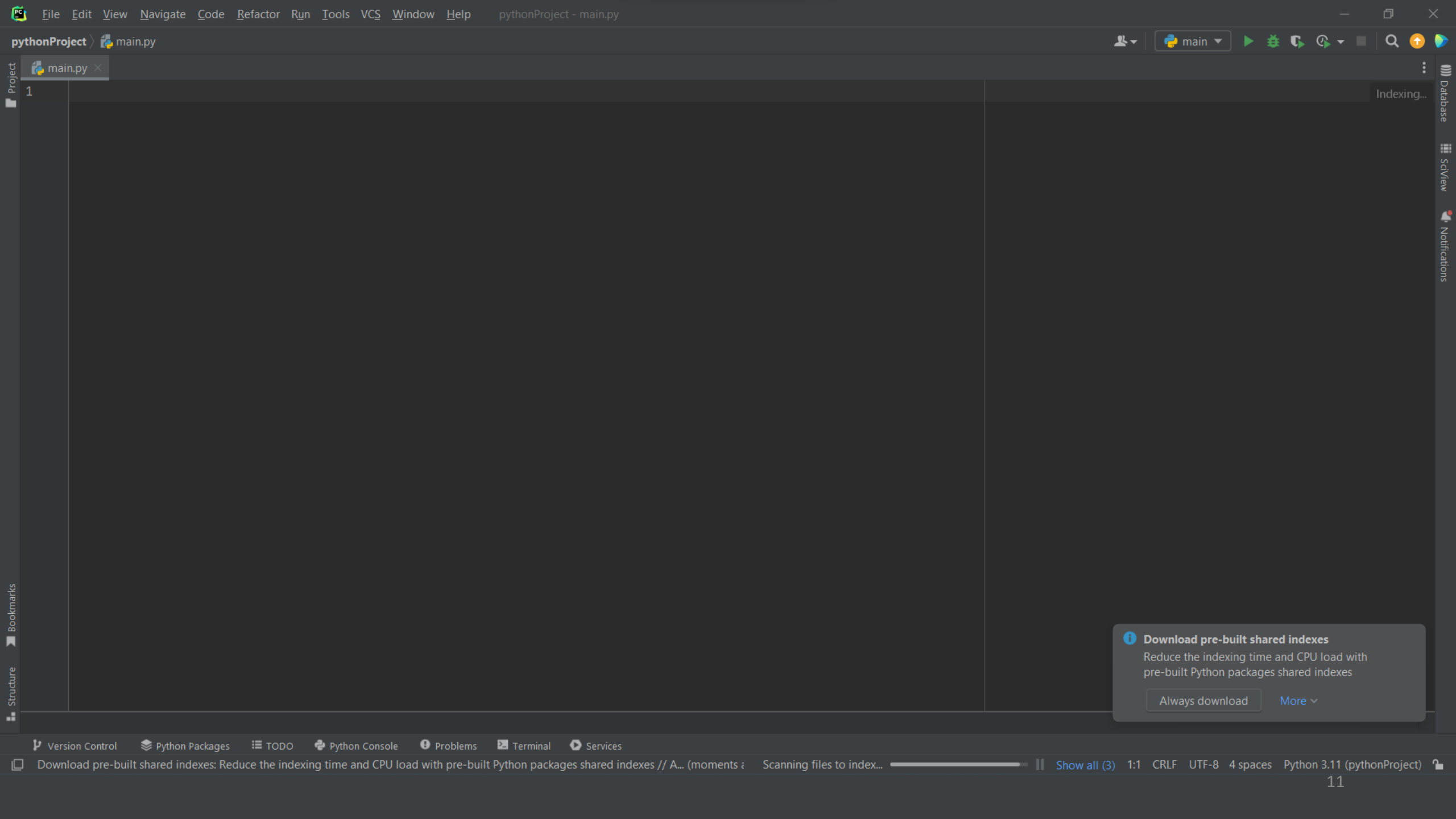


Windows

MacOS

Linux

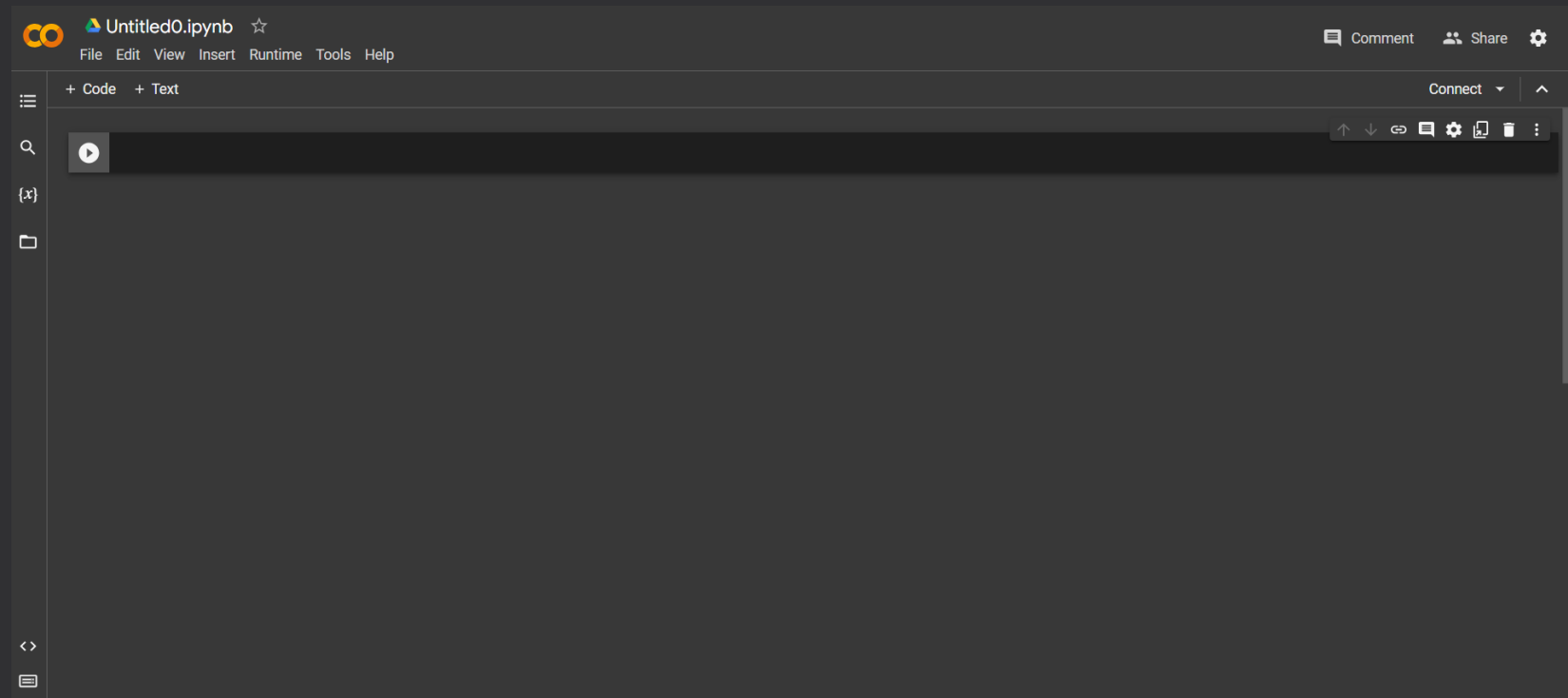
A screenshot of the PyCharm 2023.2 installation guide page. The page has a dark theme. At the top, there's a header with the PyCharm logo, version '2023.2', and a dropdown arrow. To the right of the header are links for 'Shortcuts: Windows', a user profile icon, a 'Get PyCharm' button, and a search icon. On the left side, there's a sidebar menu with categories like 'Getting started', 'Installation guide' (which is highlighted), 'Quick start guide', 'User interface', 'Migrate from text editors', 'First steps', 'Learn IDE features', 'Accessibility features', 'Learn keyboard shortcuts', 'PyCharm for Education', 'Work offline', 'Command-line interface', and 'Configure PyCharm'. The main content area is titled 'Install PyCharm' and includes a sub-header 'Getting started / Installation guide'. Below the title, it says 'Last modified: 14 July 2023'. The main text describes PyCharm as a cross-platform IDE and mentions two editions: Professional and Community. At the bottom, there's a section titled 'System requirements' with a table that has three columns: 'Requirement', 'Minimum', and 'Recommended'. On the right side of the main content area, there's a vertical list of links: 'Install PyCharm', 'System requirements', 'Install using the Toolbox App', 'Standalone installation', 'Silent installation on Windows', and 'Install as a snap package on Linux'.



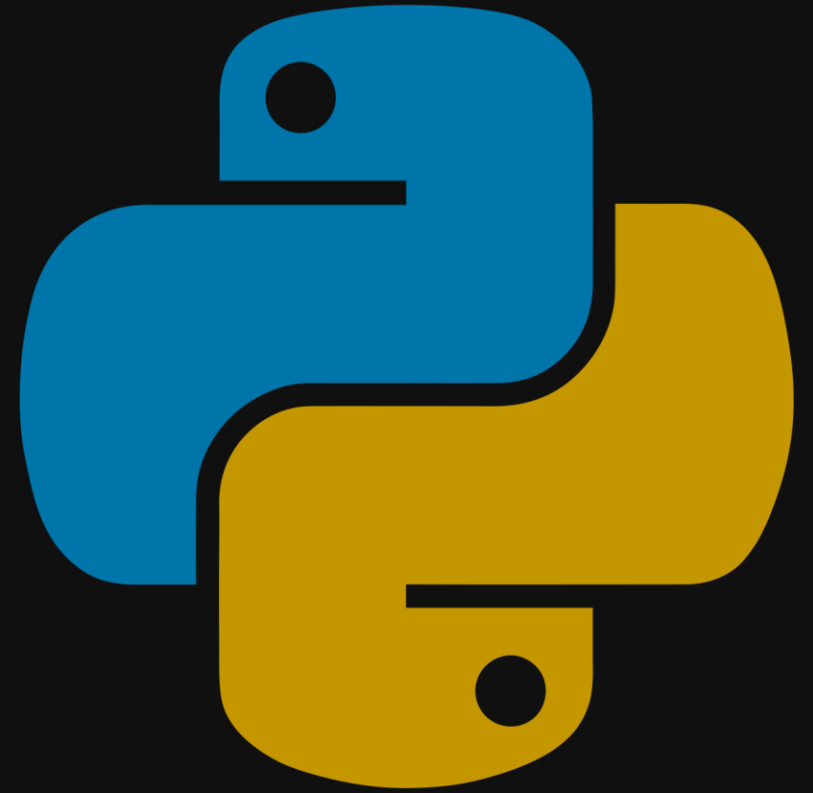
Google Colab

Online

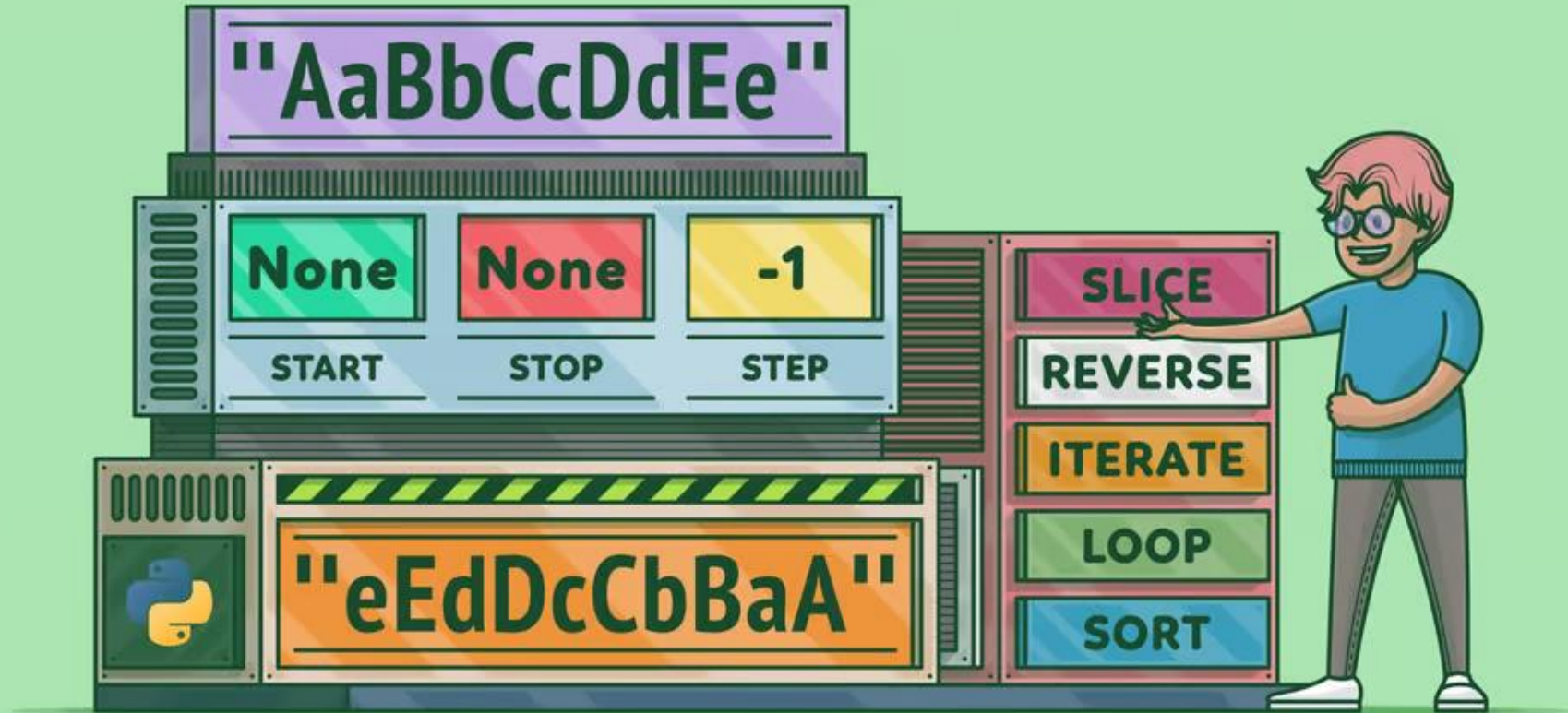
Google



```
>>> print("Hello World")  
Hello World
```



Start Programming with Python



Value

3

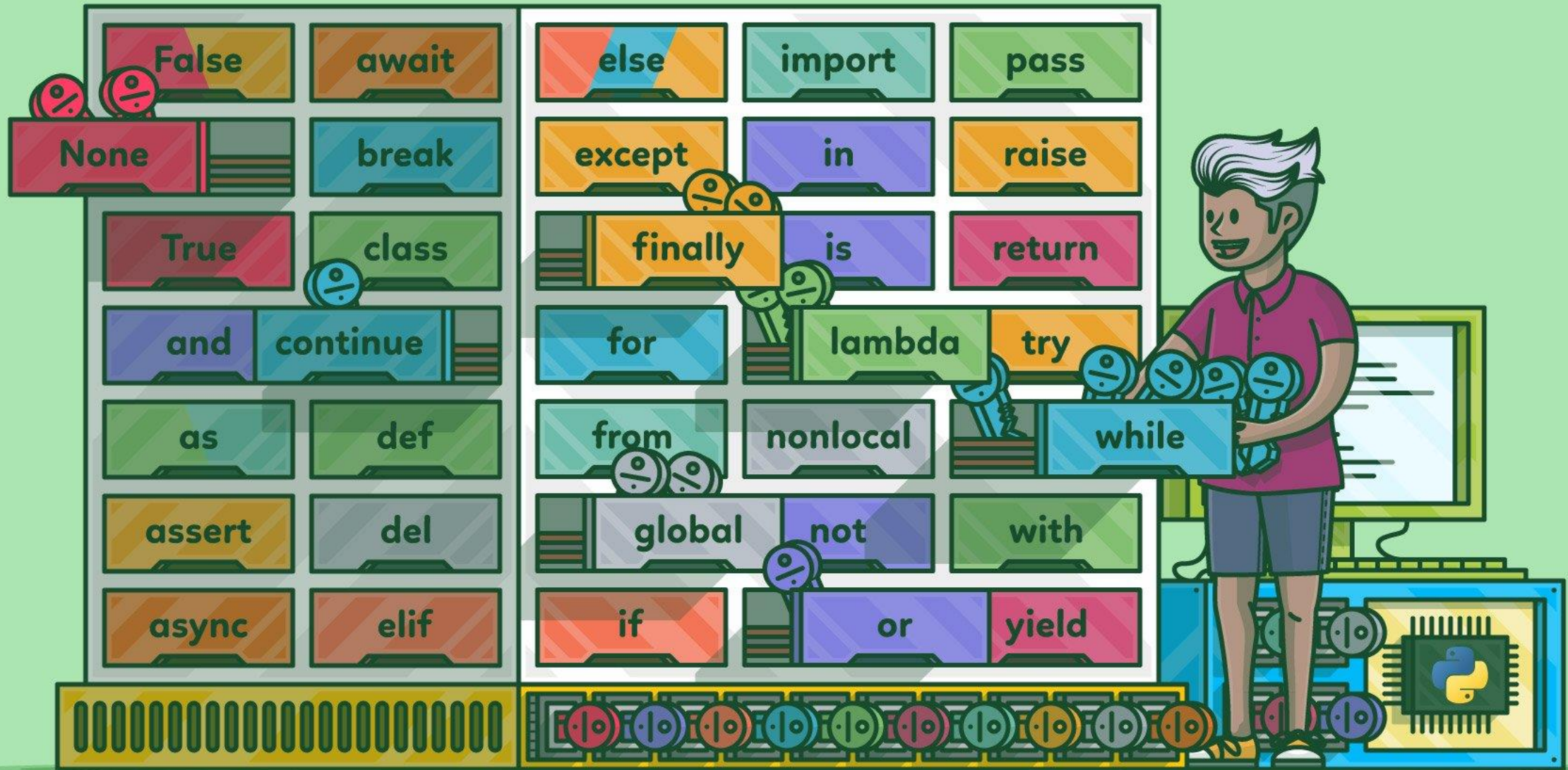
4.5

“Hello, World”

Type()

Variables, expressions, statements

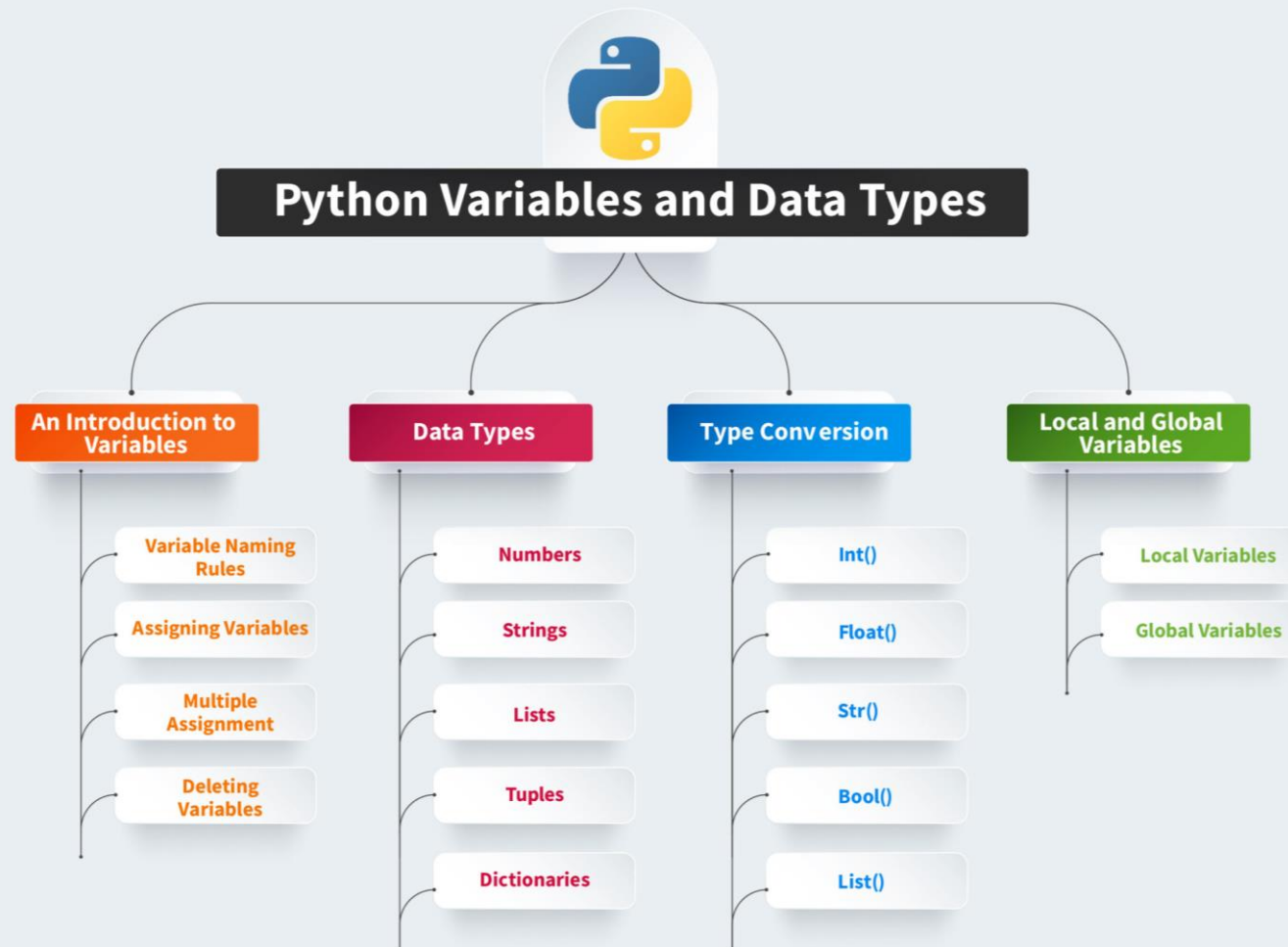
- What is the Variables?
- Different types of variables in Python:
 - Numbers
 - String
 - List
 - Tuple
 - Dictionary
- Naming Variables
 - '_' and '—'
 - A-Z & a-z
 - 0-9
 - NameError**



Variables, expressions, statements

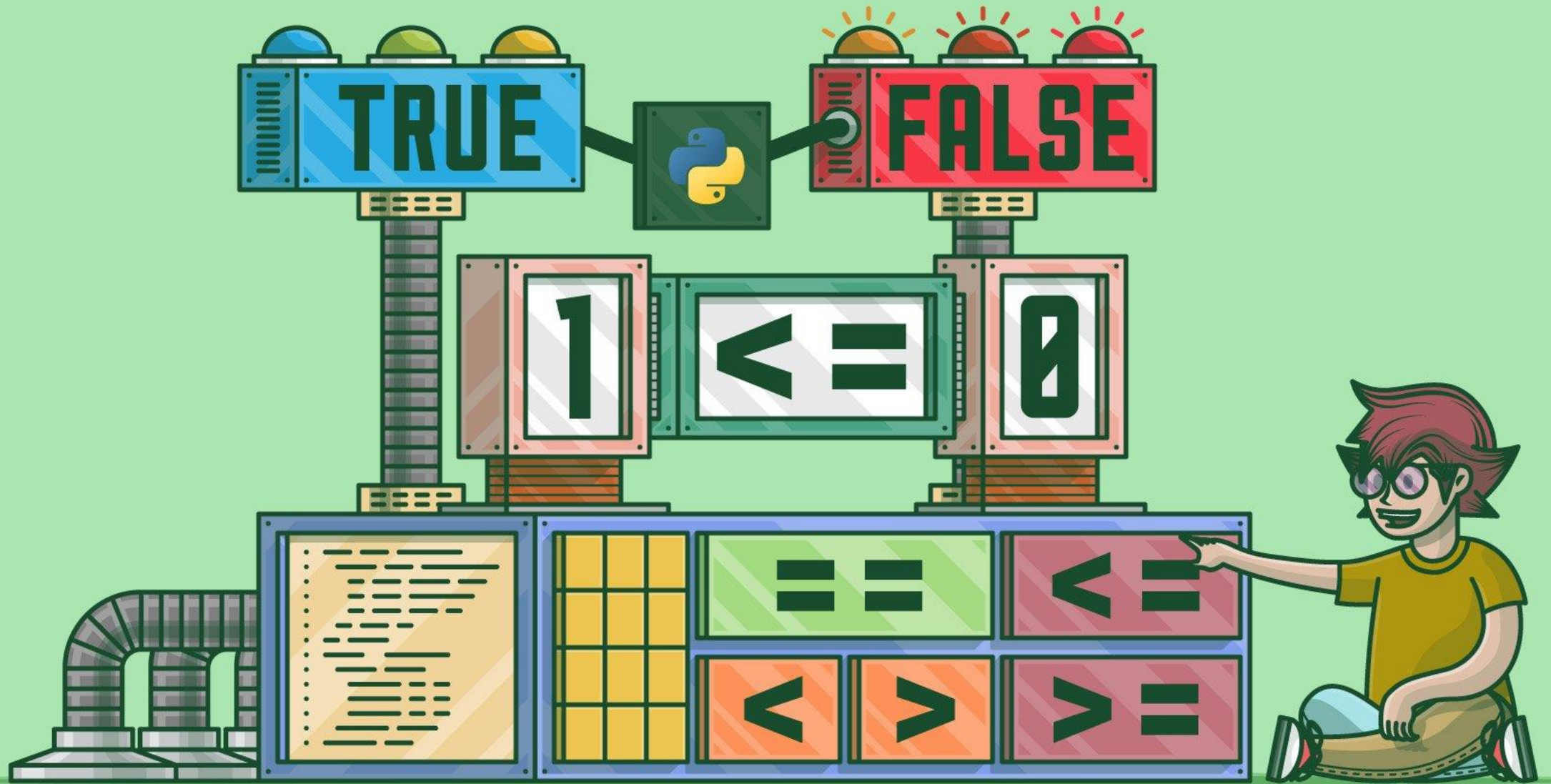
- A statement is an instruction that the Python interpreter can execute.
- A combination of operands and operators is called an expression.

Variables, expressions, statements



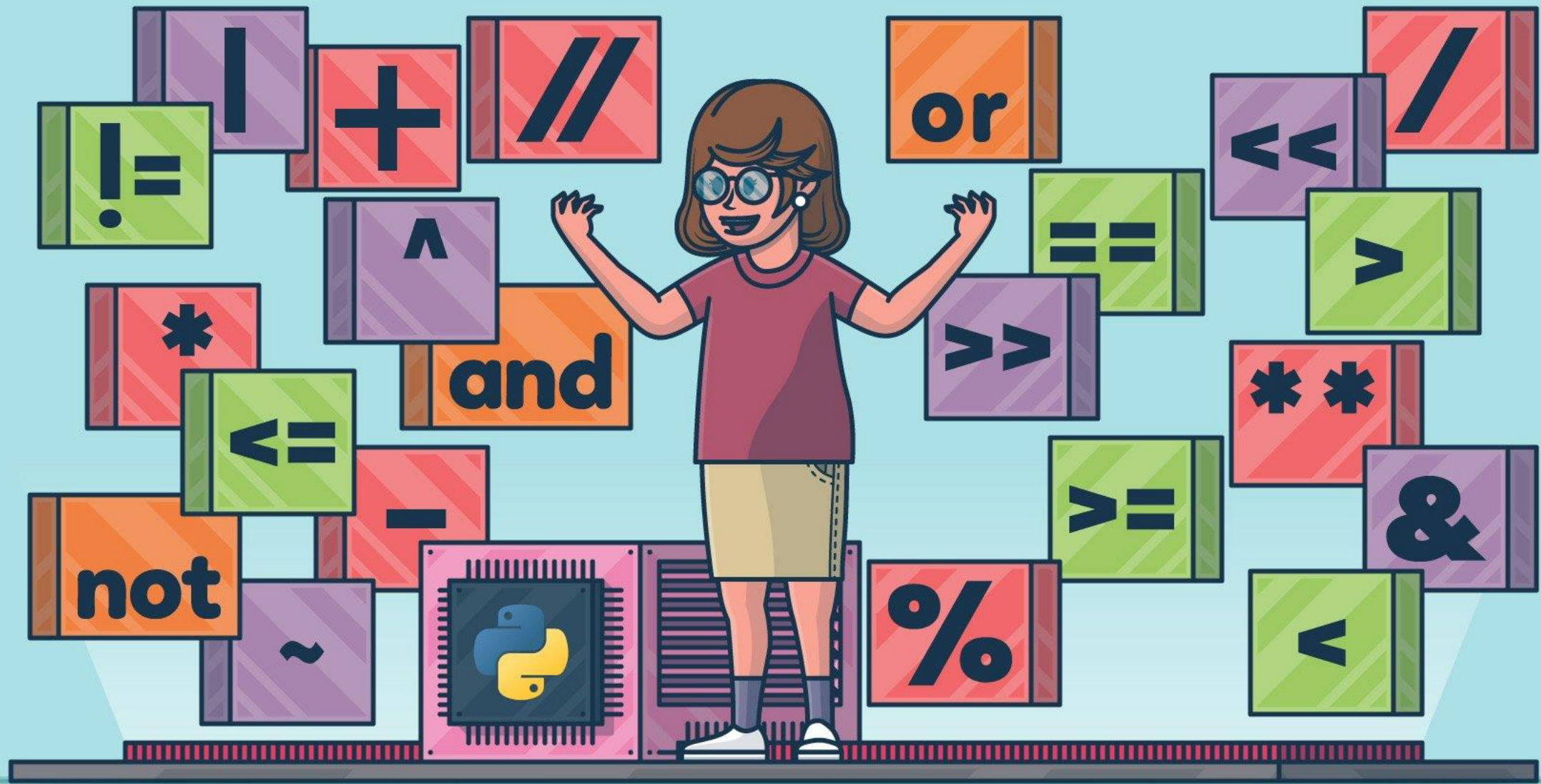
Logical Operators

Operator	Meaning	Example	Result
>	Greater than	2 > 5	False
<	Less than	2 < 5	True
>=	Greater or equal to	5 >= 2	True
<=	Less or equal to	2 <= 2	True
==	Equal to	4 == 3	False
!=	Not equal to	5 != 2	True

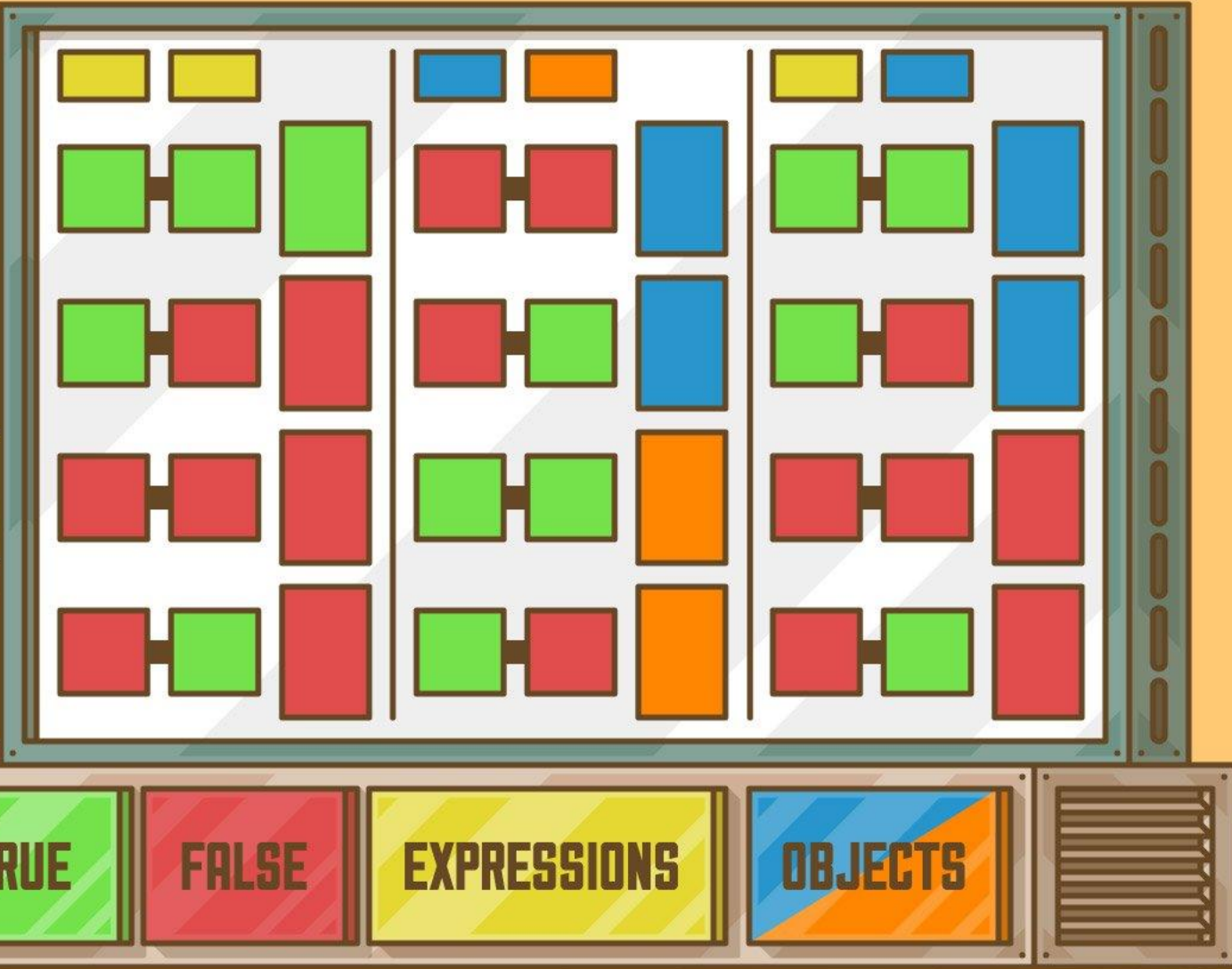


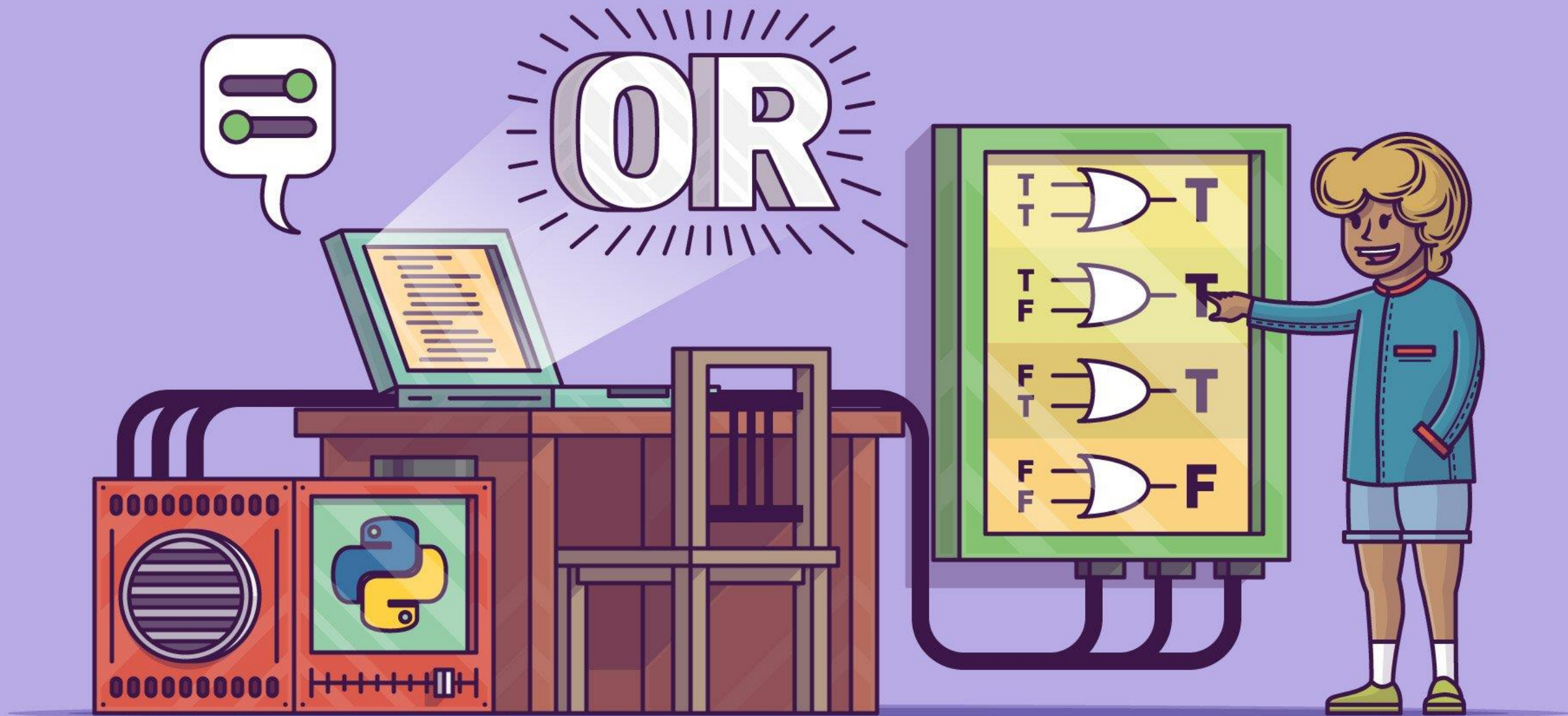
Mathematical Operators

Operator	Meaning	Example	Result
+	Addition	$4 + 2$	6
-	Subtraction	$4 - 2$	2
**	Exponent	$4 ** 2$	16
*	Multiplication	$4 * 2$	8
/	Division	$4 / 2$	2
%	Modulus operator...	$5 \% 2$	1
//	Integer Division	$5 // 2$	2



and





not



Contact US



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sakhaiea@gmail.com



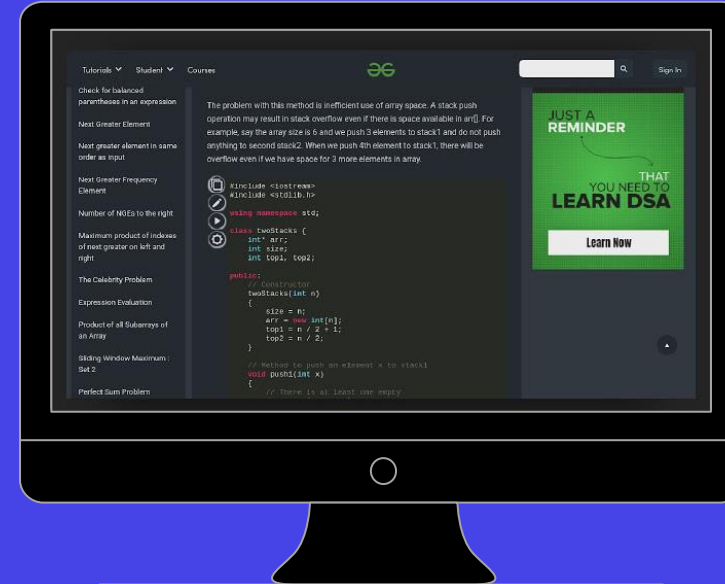
@Aminsakhaei

Extra References

www.geeksforgeeks.org

stackoverflow.com

Python for Programmers: With Big Data and Artificial Intelligence Case Studies



```
print("Have a nice day!")
```

