Introduction to Programming with Python

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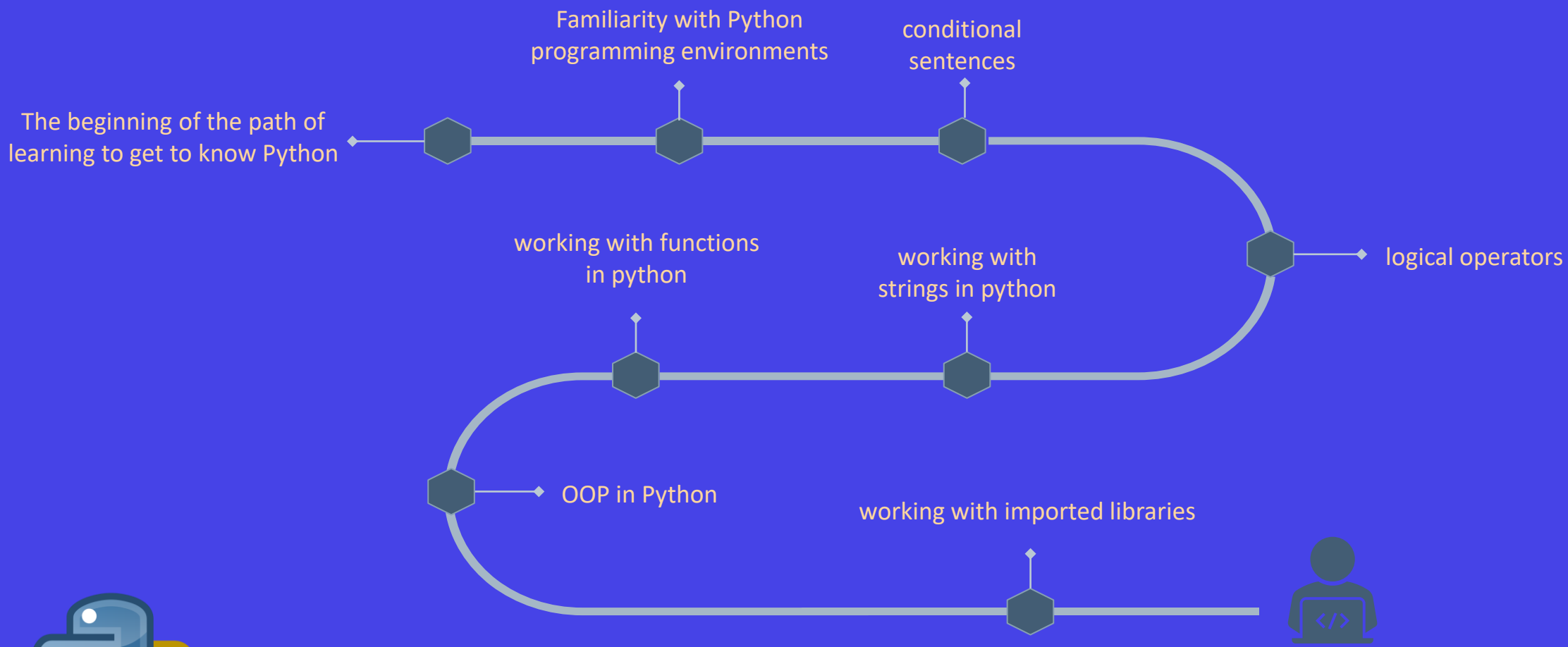
Amirkabir University of Technology

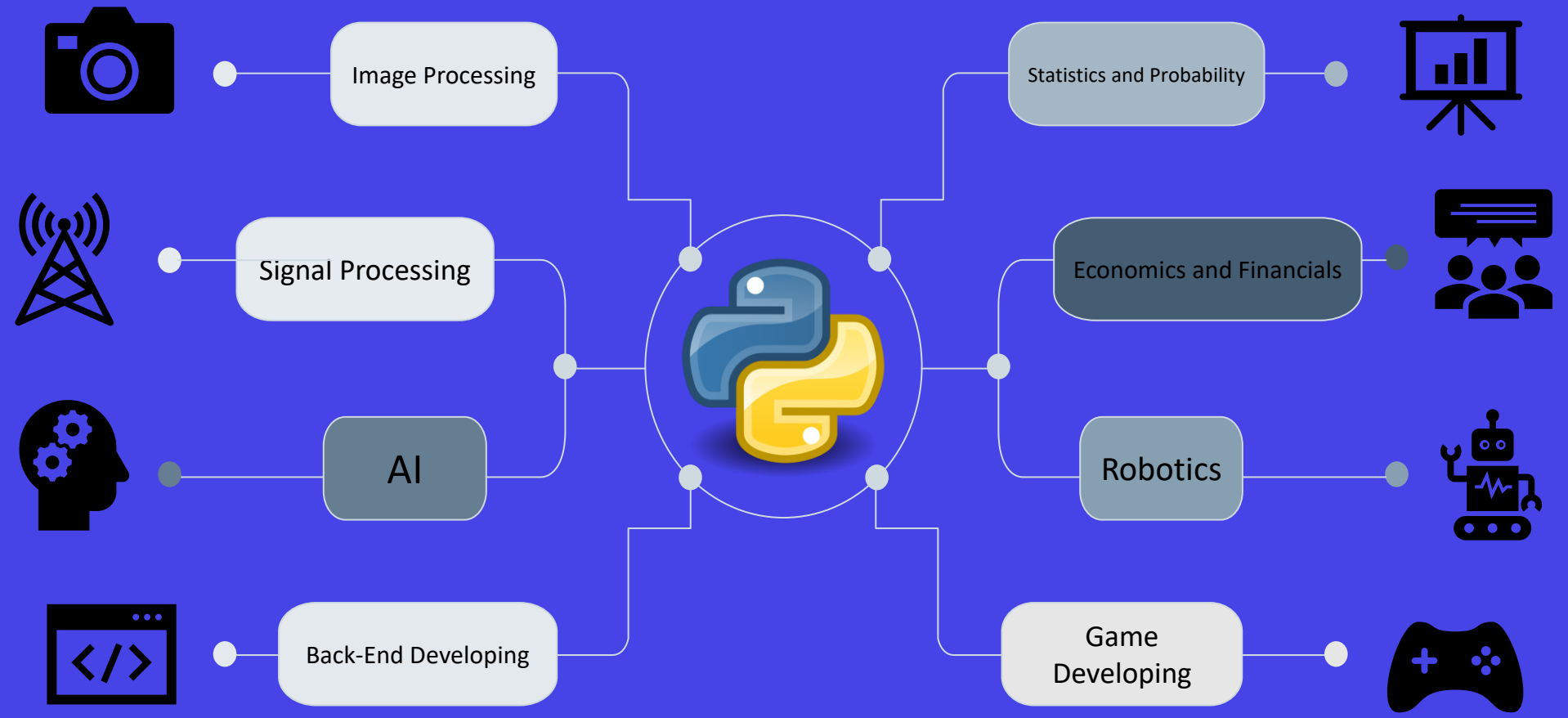
Department of Biomedical Engineering

Summer 2023

Course Outline



Why Learn Python?



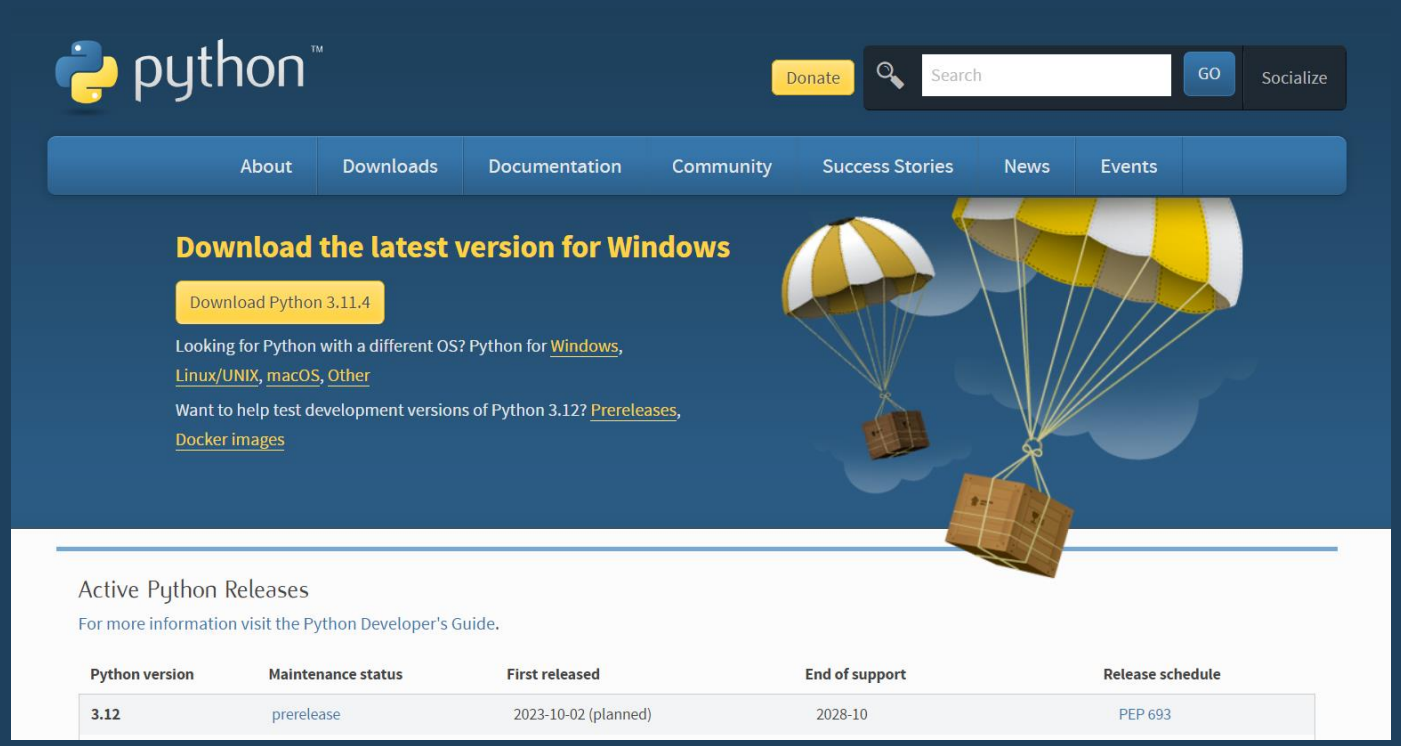
Installing Python

Open source

Windows

MacOS

Linux



What is the Programming Environment?

ANACONDA®

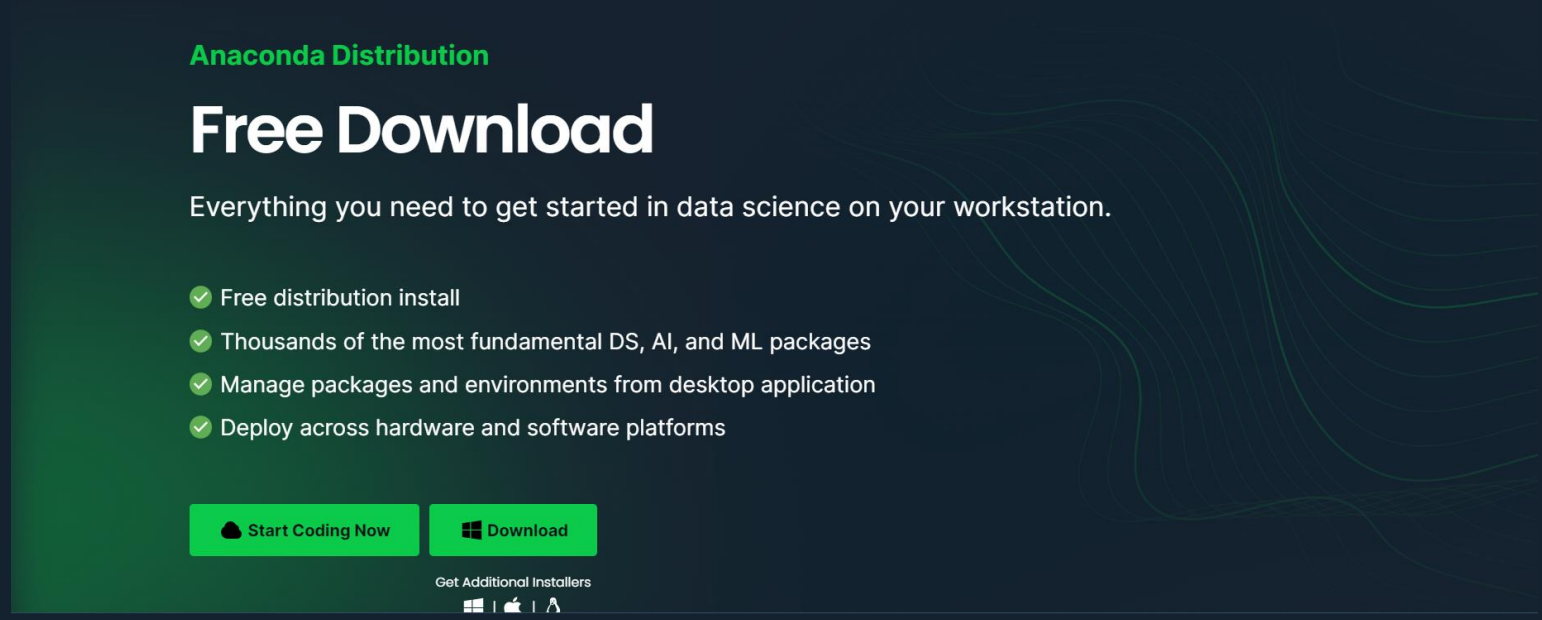
Installing Anaconda

Open source

Windows

MacOS

Linux



Anaconda Navigator

File Help

ANACONDA.NAVIGATOR

Upgrade Now | Connect

Home
Environments
Learning
Community

All applications on base (root) Channels

DataSpell
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.
Install

CMD.exe Prompt
0.1.1
Run a cmd.exe terminal with your current environment from Navigator activated
Launch

JupyterLab
3.5.3
An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.
Launch

Notebook
6.5.2
Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.
Launch

Powershell Prompt
0.0.1
Run a Powershell terminal with your current environment from Navigator activated
Launch

PyCharm Professional
2023.1.3
A full-fledged IDE by JetBrains for both Scientific and Web Python development. Supports HTML, JS, and SQL.
Launch

Qt Console
5.4.0
PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.
Launch

Spyder
5.4.1
Scientific PYthon Development EnviRonment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features
Launch

VS Code
1.80.1
Streamlined code editor with support for development operations like debugging, task running and version control.
Launch

Datalore
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.
Launch

IBM Watson Studio Cloud
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.
Launch

Oracle Data Science Service
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
Launch

console_shortcut_miniconda
0.1.1

Glueviz
1.2.4
Multidimensional data visualization across files. Explore relationships within and

Orange 3
3.34.0
Component based data mining framework. Data visualization and data analysis for

)owershell_shortcut_minicond
0.0.1

RStudio
1.1.456
A set of integrated tools designed to help you be more productive with R. Includes R

A full Python IDE directly from the browser

Documentation

Anaconda Blog

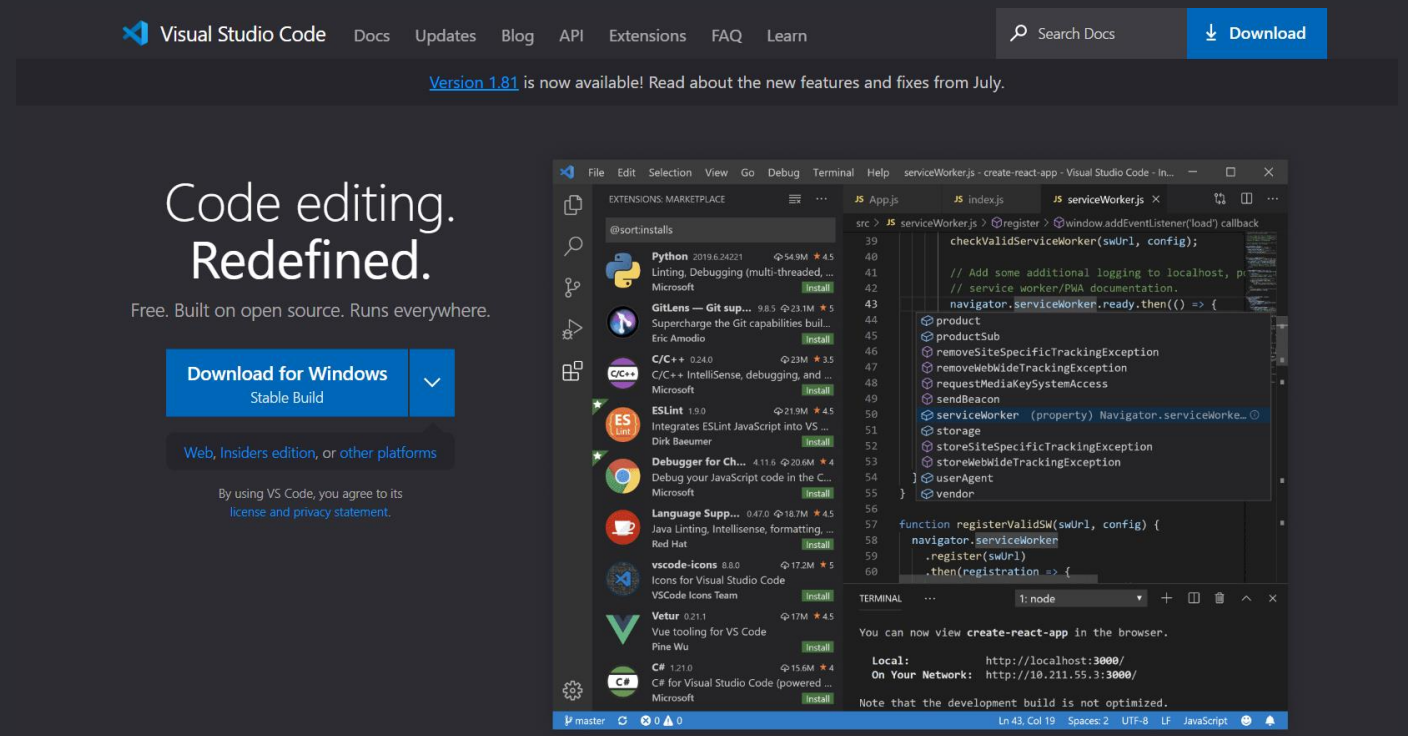
Installing VSC

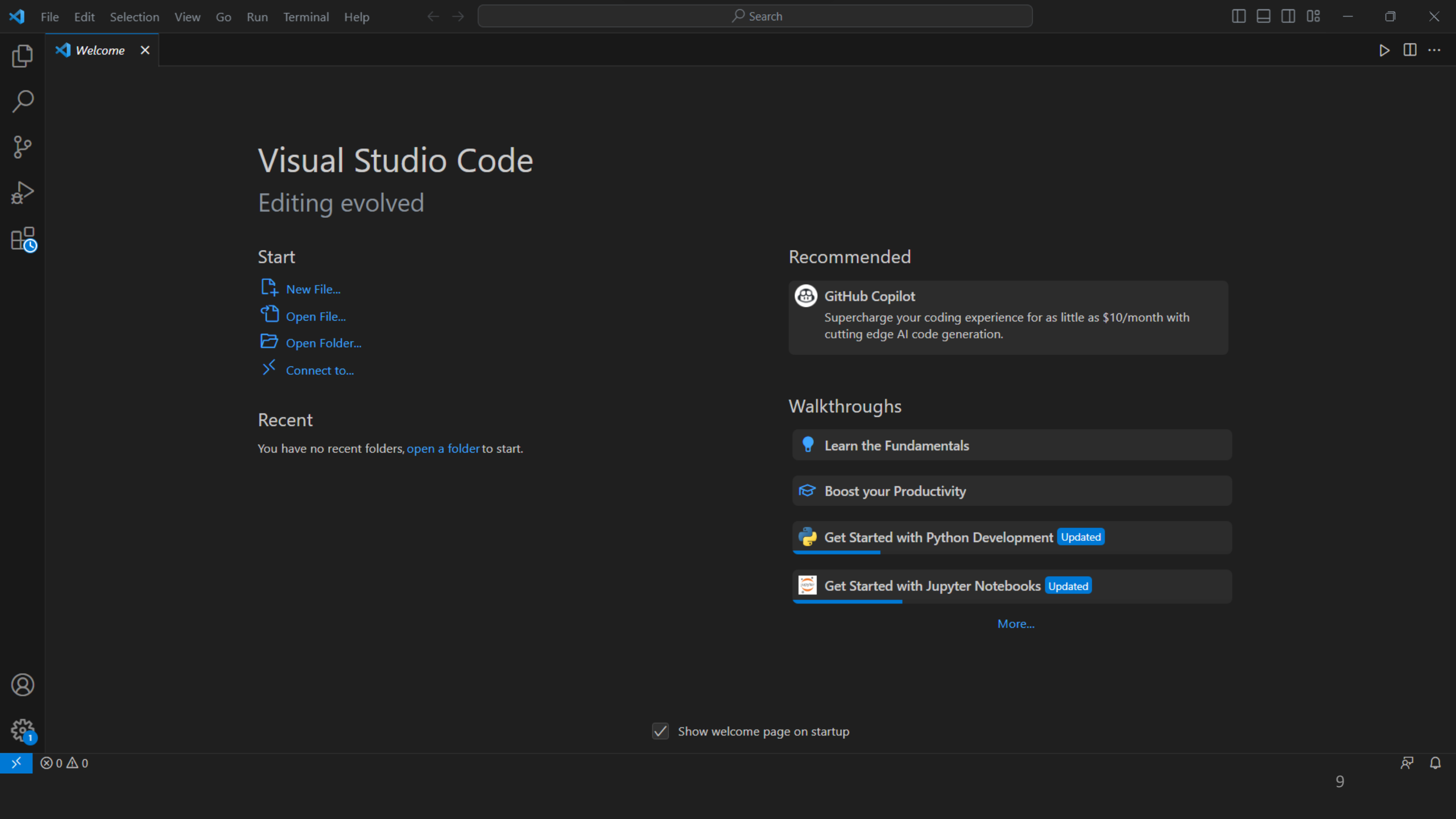
Open source

Windows

MacOS

Linux




File Edit Selection View Go Run Terminal Help
Search
Welcome
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
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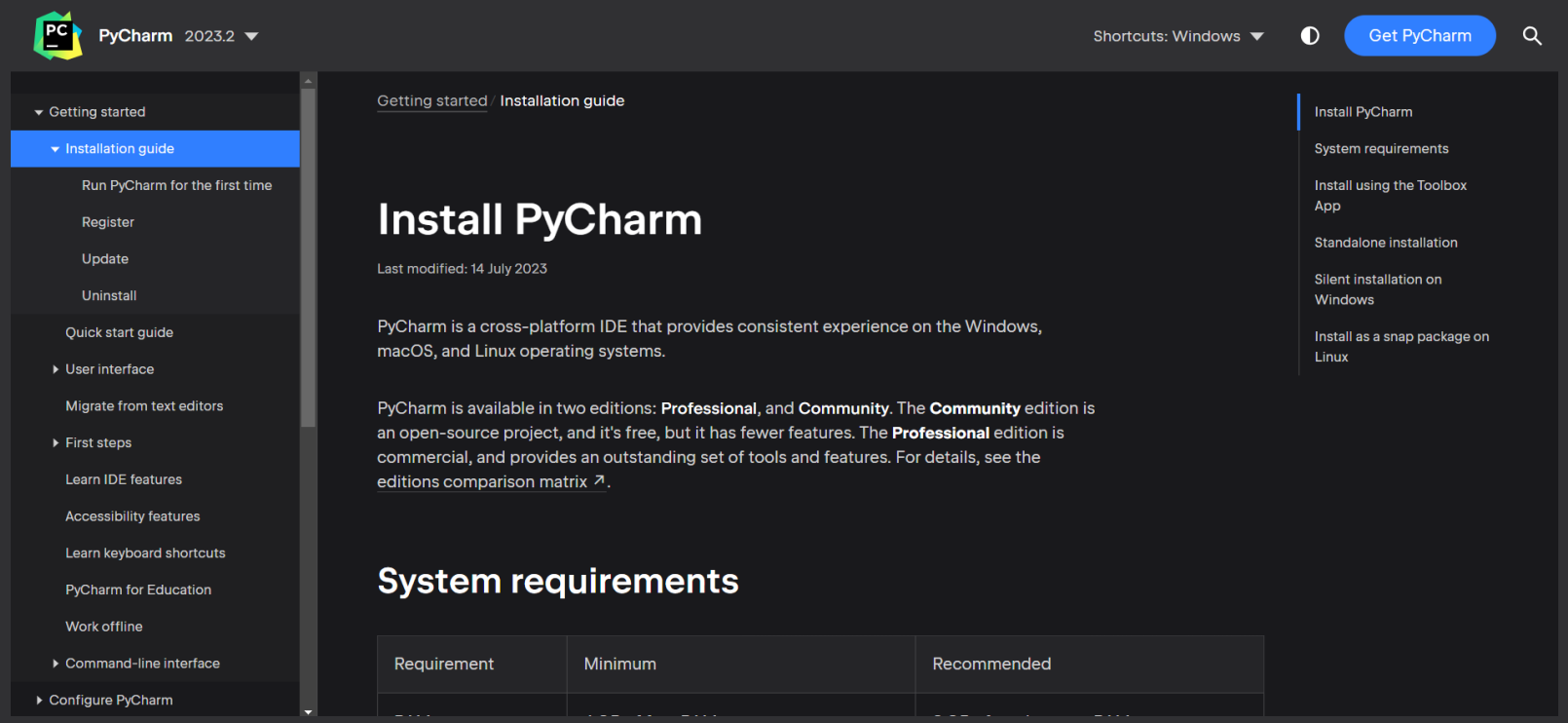
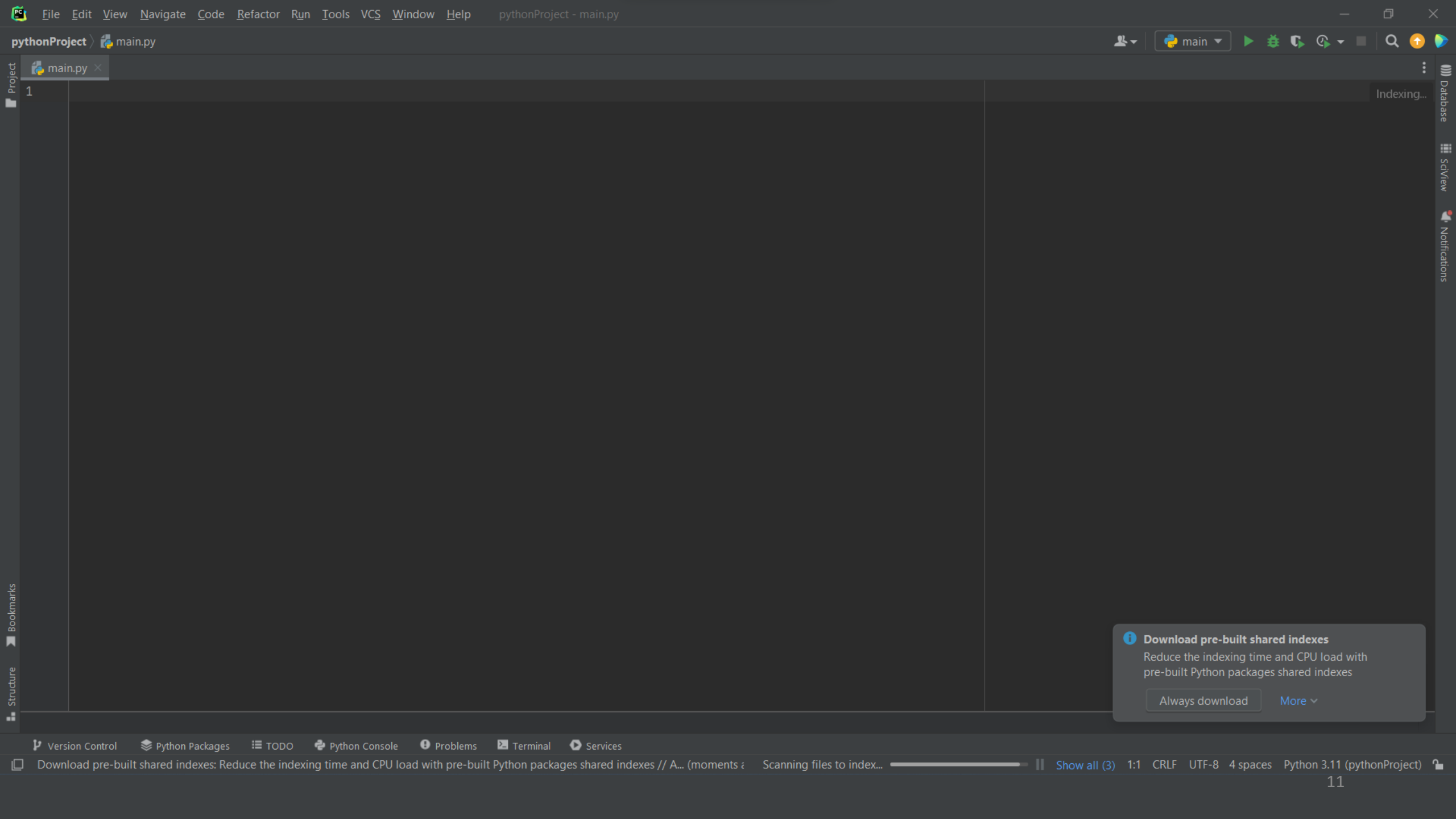
Installing PyCharm

Windows

MacOS

Linux

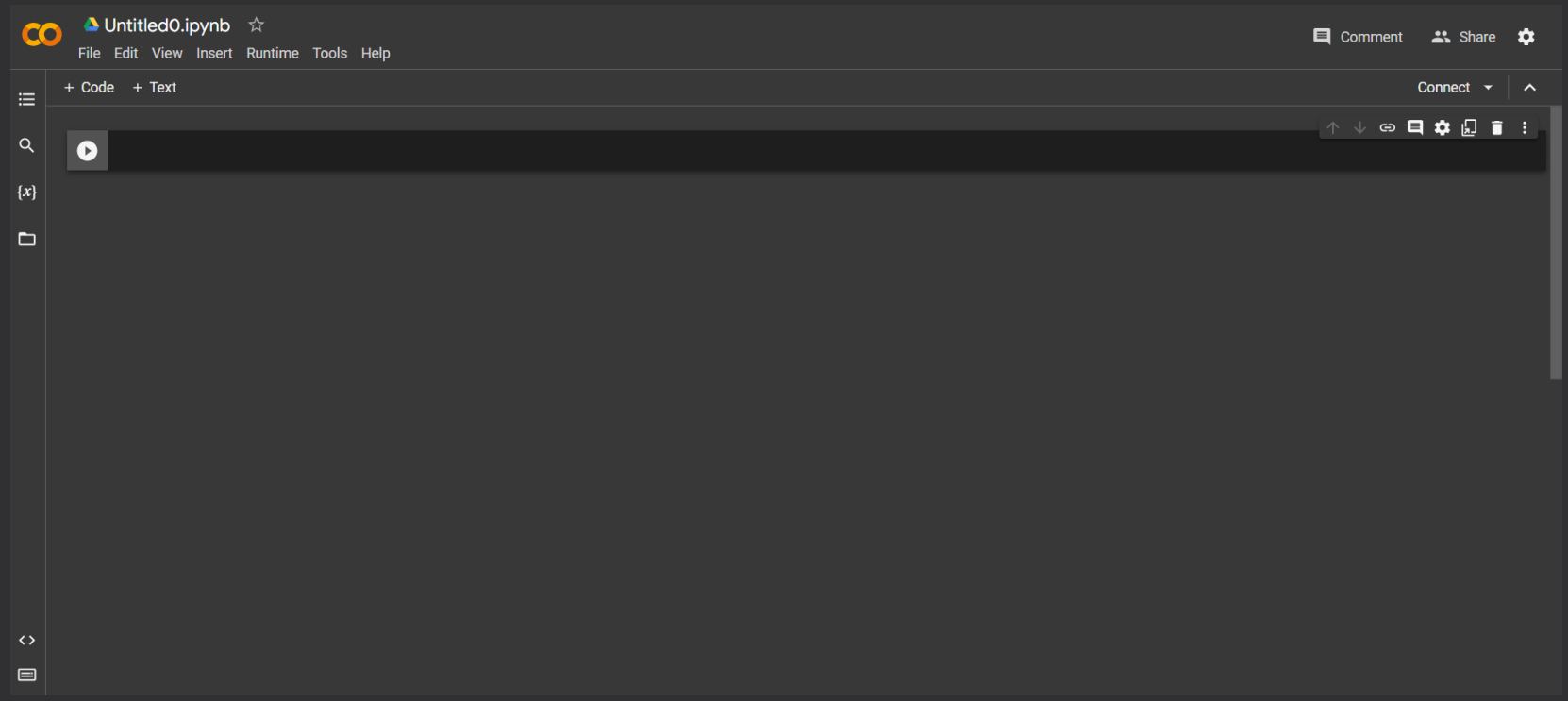



File Edit View Navigate Code Refactor Run Tools VCS Window Help
pythonProject - main.py
pythonProject
main.py
main
main.py
1
Indexing...
Project
Database
SciView
Notifications
Bookmarks
Structure
Download pre-built shared indexes
Reduce the indexing time and CPU load with pre-built Python packages shared indexes
Always download
More
Version Control
Python Packages
TODO
Python Console
Problems
Terminal
Services
Download pre-built shared indexes: Reduce the indexing time and CPU load with pre-built Python packages shared indexes // A... (moments a
Scanning files to index...
Show all (3)
1:1
CRLF
UTF-8
4 spaces
Python 3.11 (pythonProject)

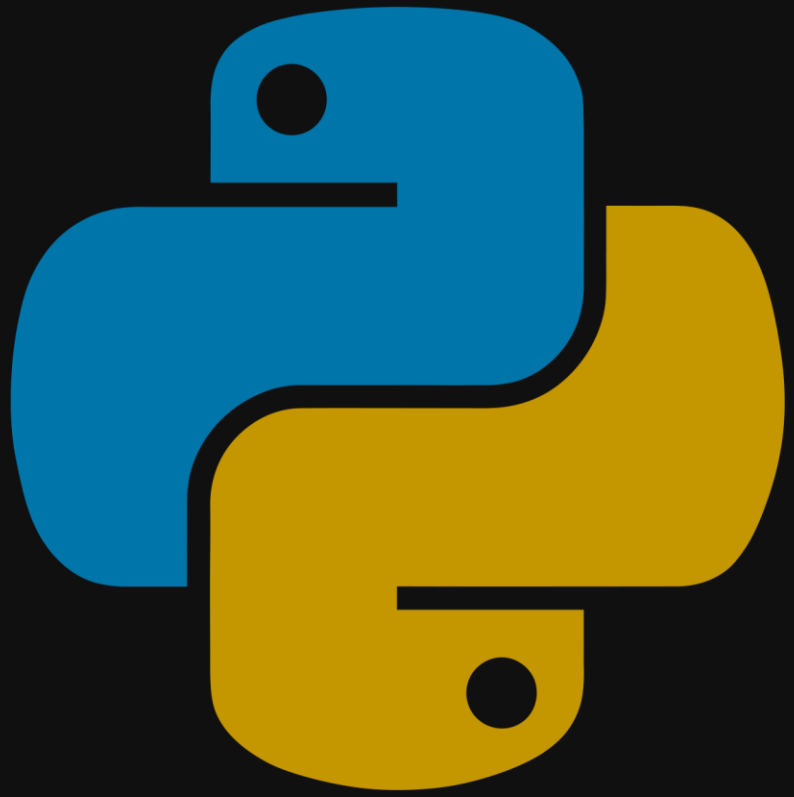
Google Colab

Online

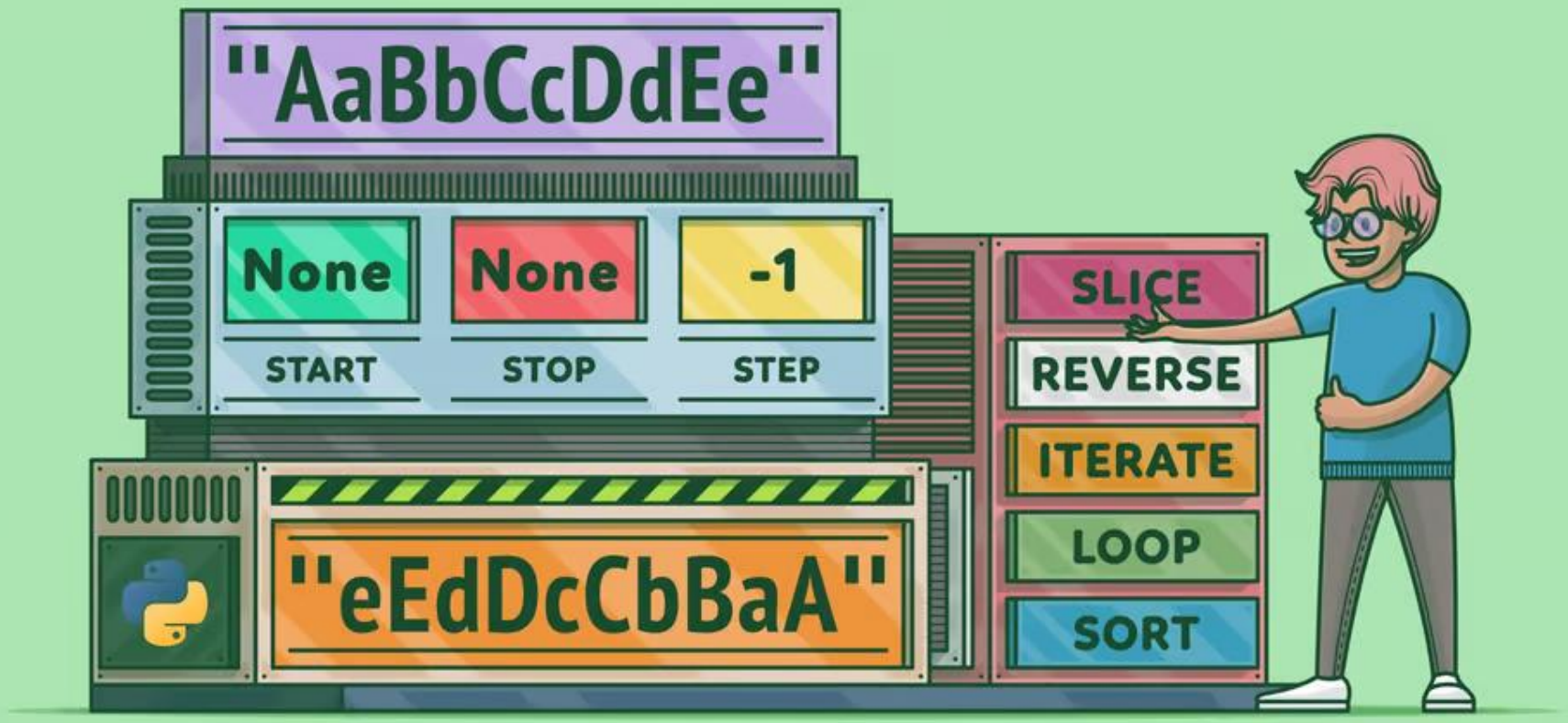
Google



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



Start Programming with Python



Value

3

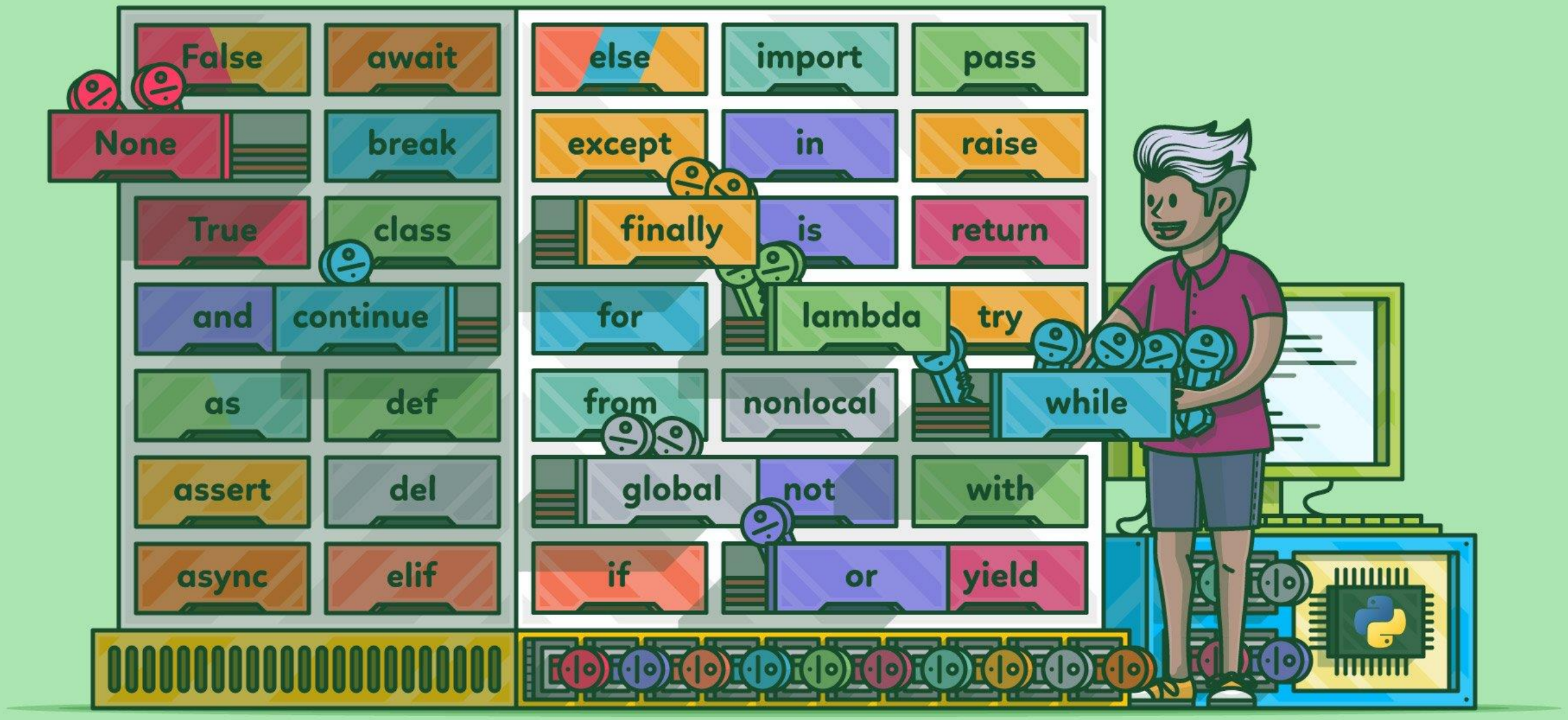
4.5

“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**

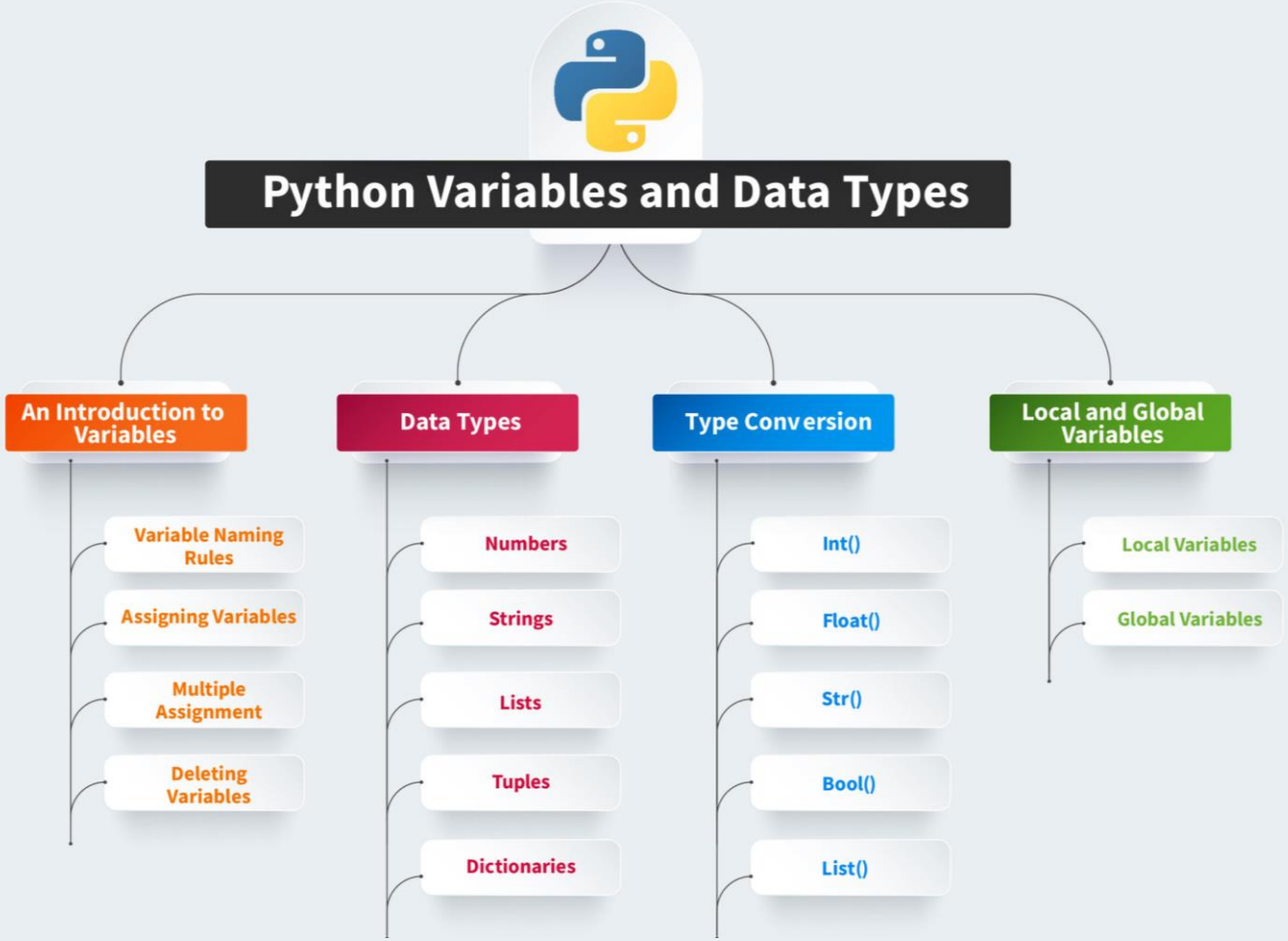

False
await
else
import
pass
None
break
except
in
raise
True
class
finally
is
return
and
continue
for
lambda
try
as
def
from
nonlocal
while
assert
del
global
not
with
async
elif
if
or
yield

Variables, expressions, statements

- A statement is an instruction that the Python interpreter can execute.

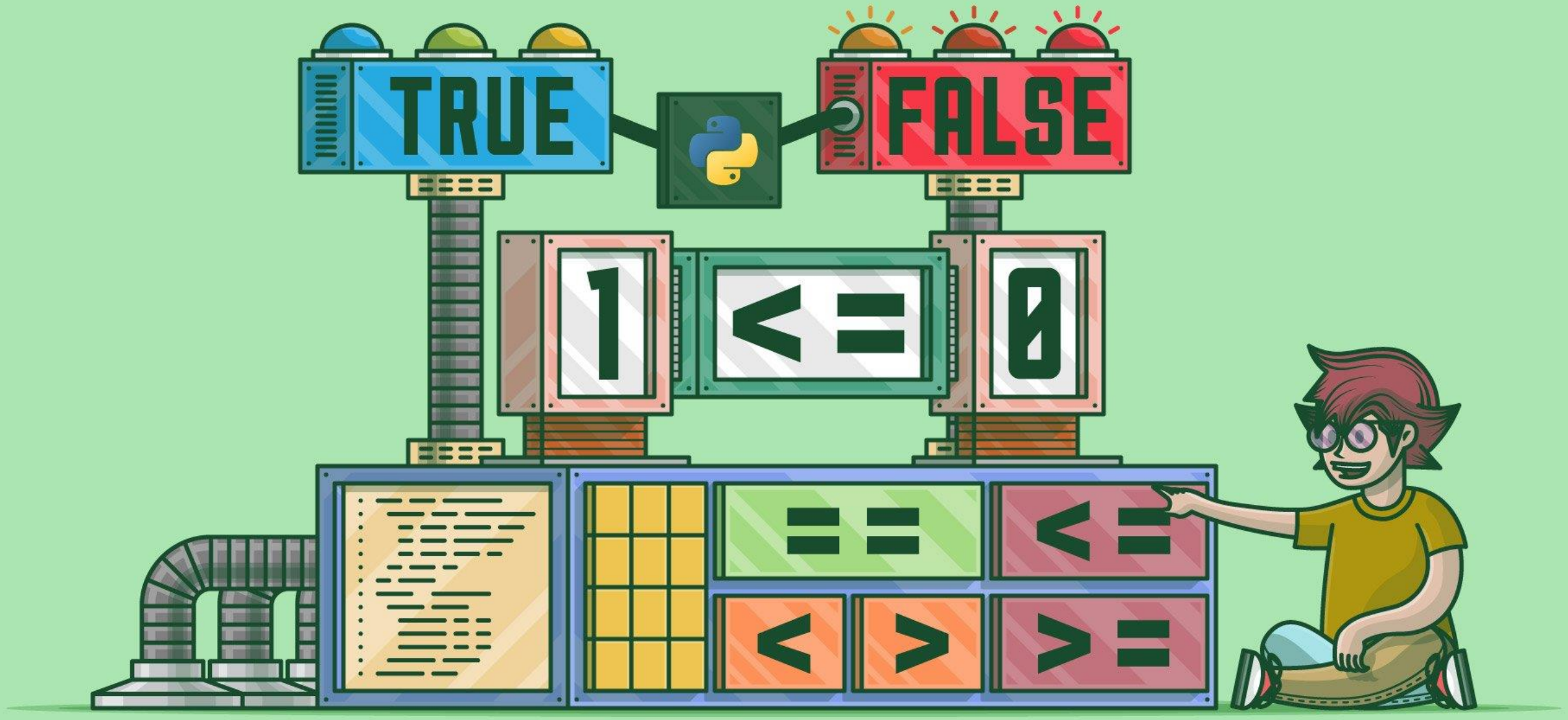
- A combination of operands and operators is called an expression.

Variables, expressions, statements



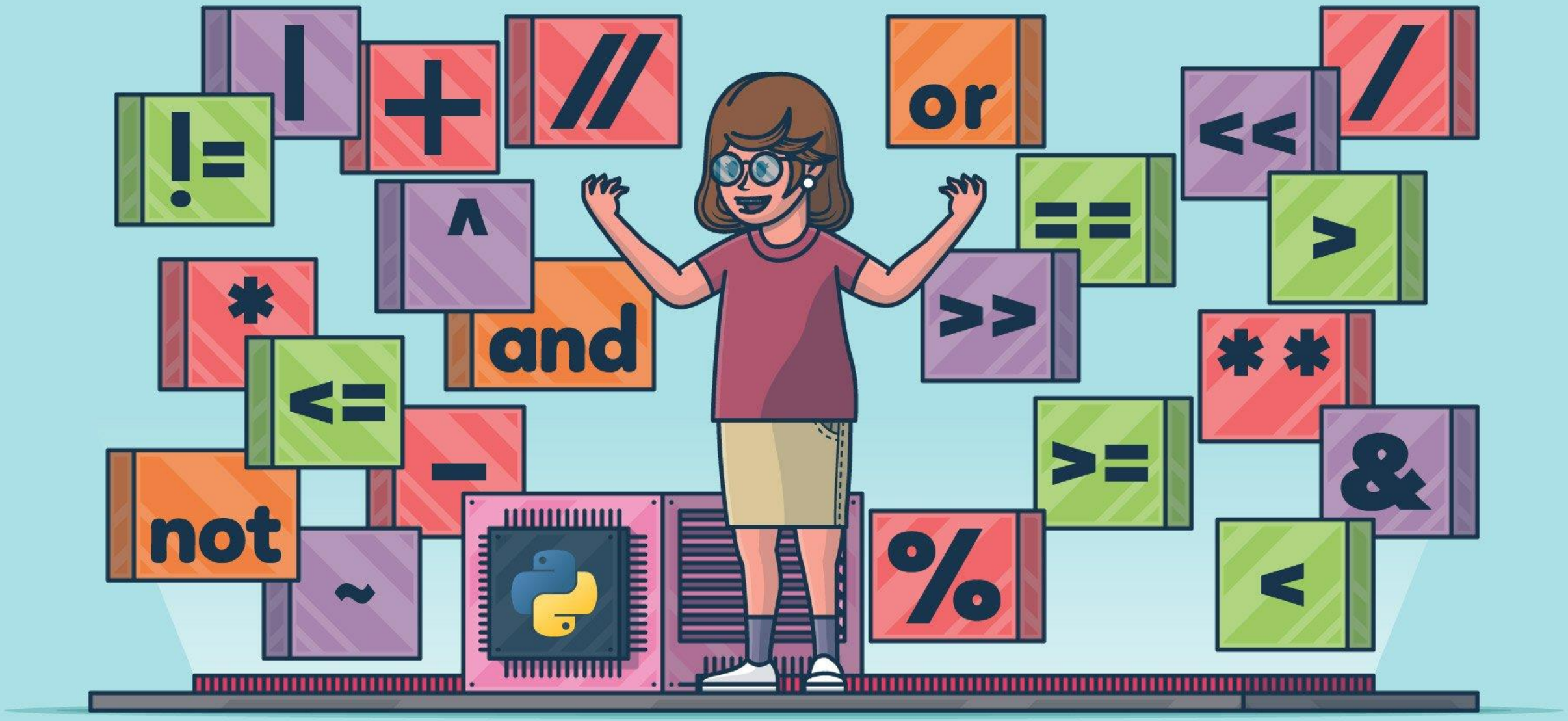
Logical Operators

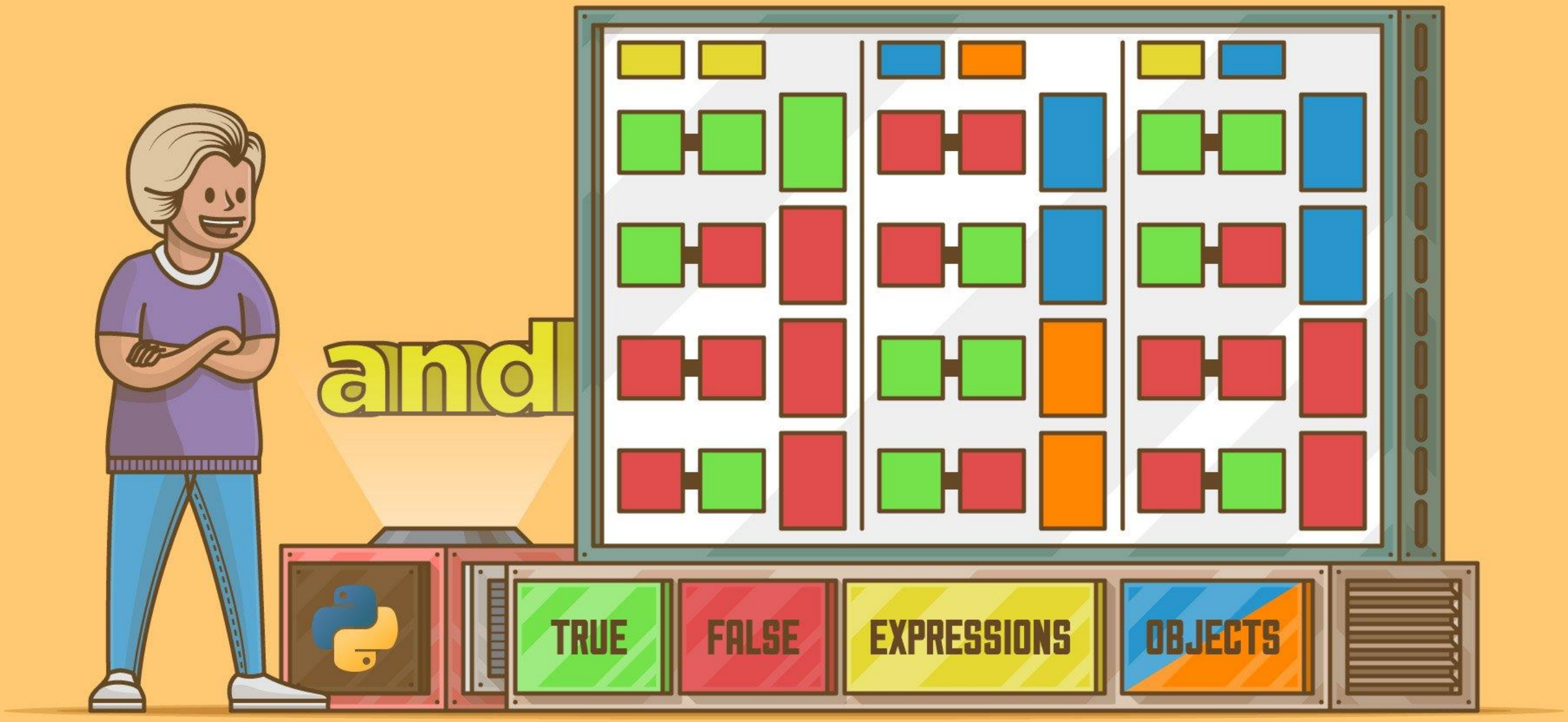
Operator	Meaning	Example	Result
>	Greater than	2 > 5	False
<	Less than	2 < 5	True
>=	Greater or equal to	5 >= 2	True
<=	Less or equal to	2 <= 2	True
==	Equal to	4 == 3	False
!=	Not equal to	5 != 2	True

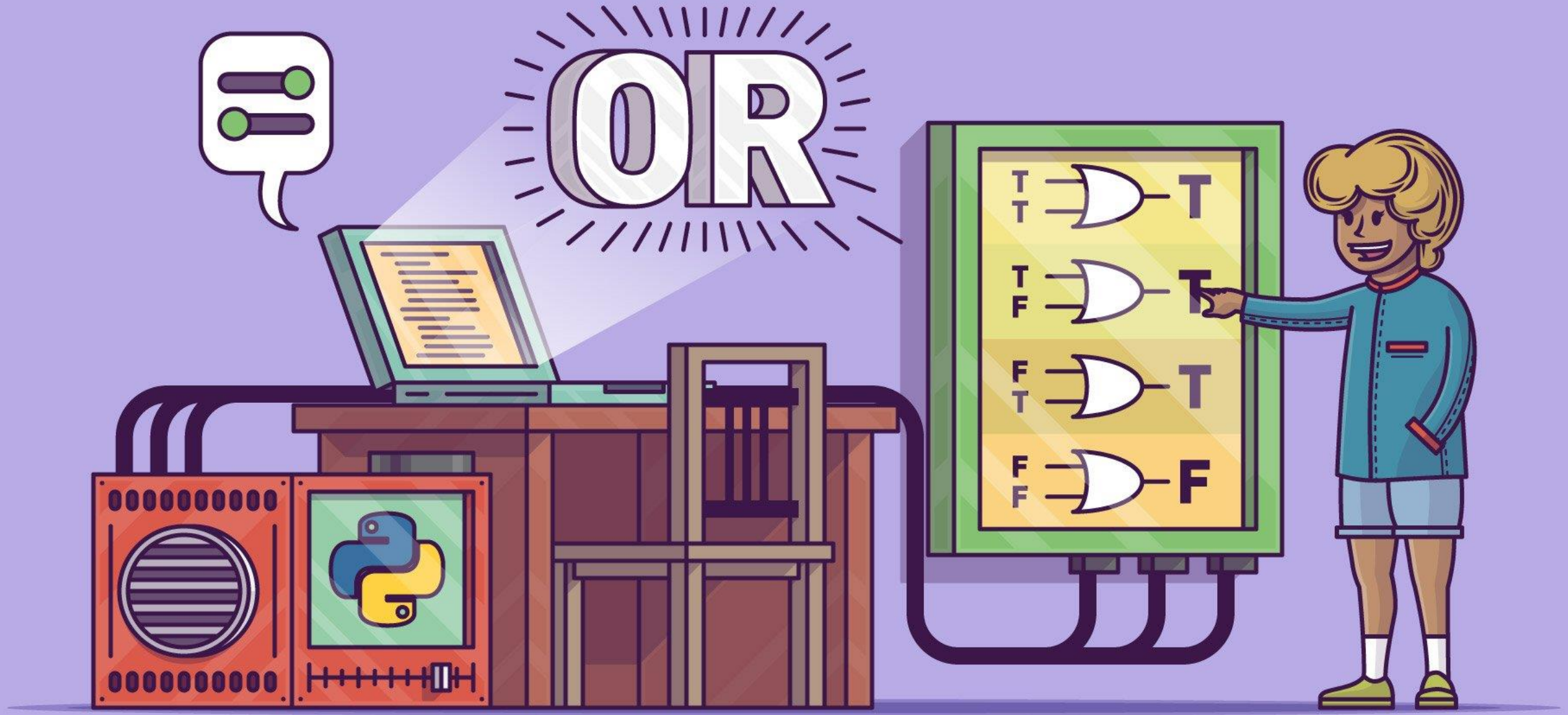

TRUE
FALSE
1 <= 0
==
<=
<
>
>=

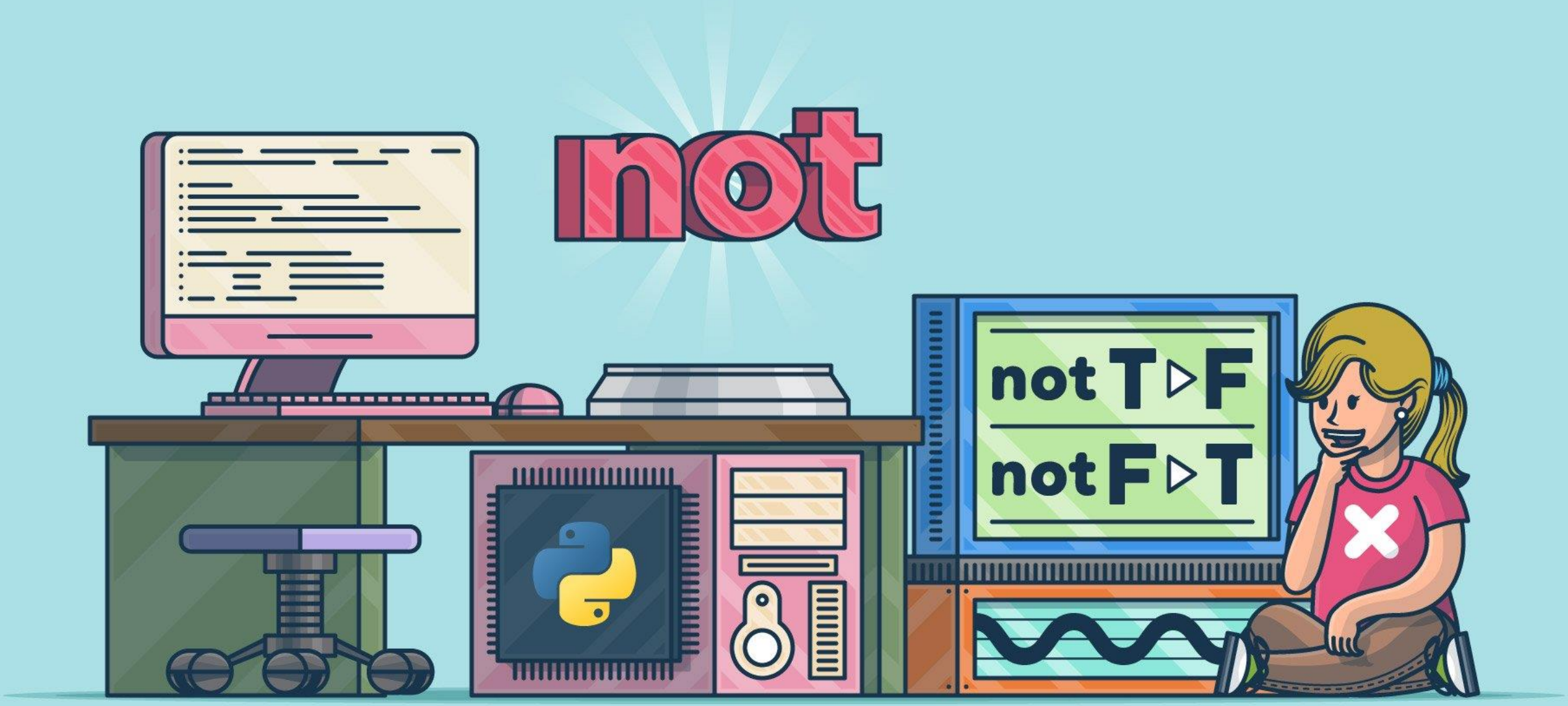
Mathematical Operators

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


|
+
//
or
/
!=
<<
==
^
>
*
>>
and
**
<=
&
not
-
>=
~
%
<


and
TRUE
FALSE
EXPRESSIONS
OBJECTS


OR
T T T
T F T
F T T
F F F


not
not T ▷ F
not F ▷ T

Contact US

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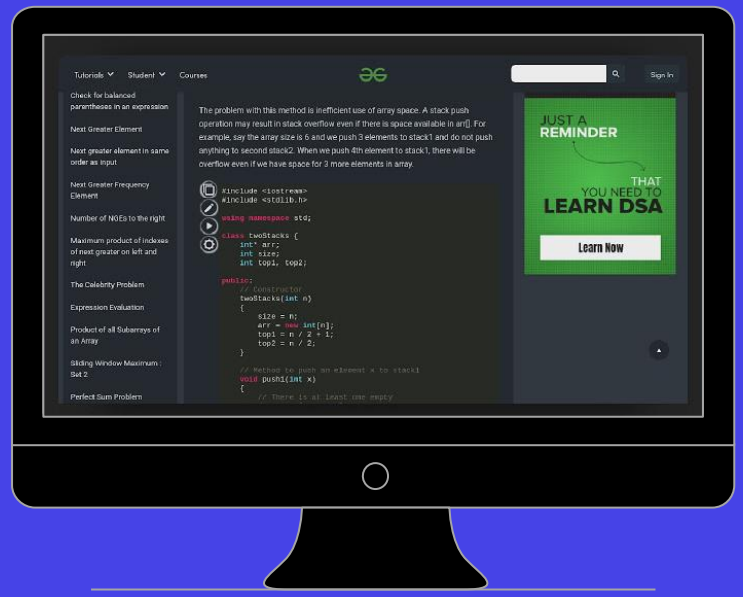
Extra References

www.geeksforgeeks.org

stackoverflow.com

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



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