

Advanced Programming

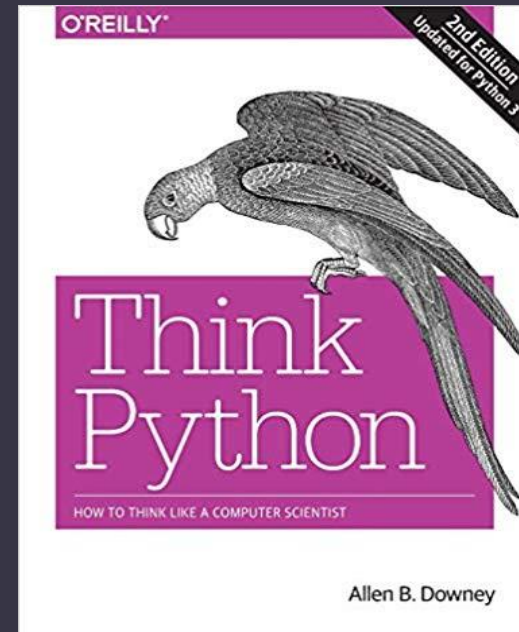
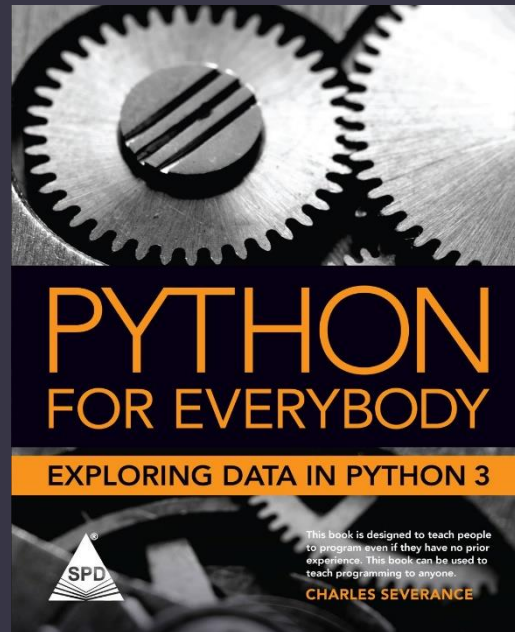
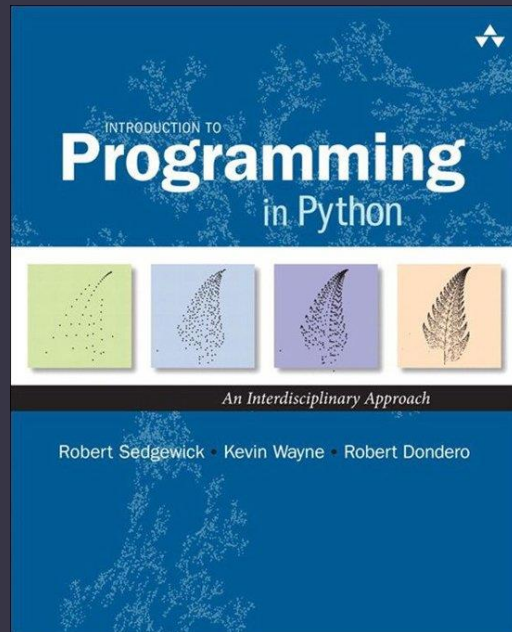
INTRODUCTION

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2022

Resources

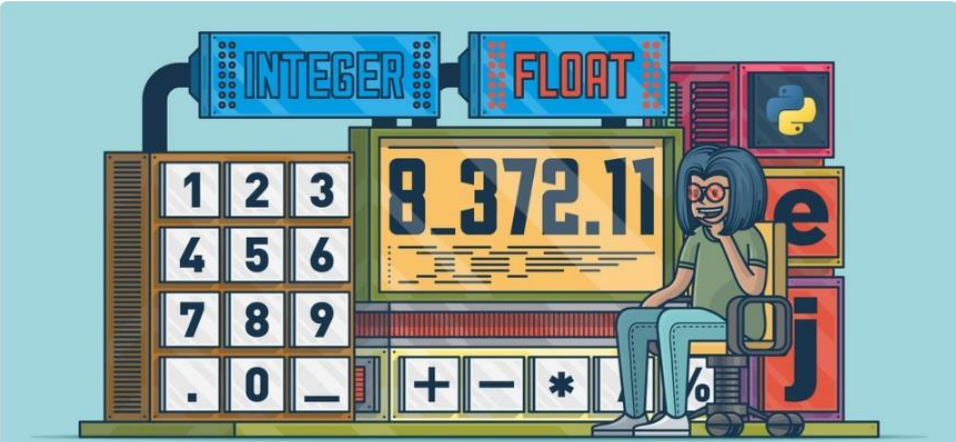


Realpython.com



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 Python Tricks 

```
1# How to merge two dicts
2# in Python 3.5+
3
4>>> x = {'a': 1, 'b': 2}
5>>> y = {'b': 3, 'c': 4}
6
7>>> z = {**x, **y}
8
9>>> z
10{'c': 4, 'a': 1, 'b': 3}
```

Email...

[Get Python Tricks »](#)

 No spam. Unsubscribe any time.

W3school.com/python

The screenshot shows the W3schools website's Python tutorial page. The browser's address bar displays 'w3schools.com/python/default.asp'. The website's logo 'w3schools.com' is in the top left, and the tagline 'THE WORLD'S LARGEST WEB DEVELOPER' is on the right. A navigation menu at the top includes links for HTML, CSS, JAVASCRIPT, SQL, PYTHON (highlighted), PHP, BOOTSTRAP, HOW TO, W3.CSS, JQUERY, MORE, REFERENCES, and CERTIFICATION. A left sidebar lists the 'Python Tutorial' topics, with 'Python HOME' selected. The main content area features the title 'Python Tutorial', navigation buttons for '< Home' and 'Next >', and a green banner with the Python logo, the text 'Python is a programming language. Python can be used on a server to create web applications.', and a 'Start learning Python now >>' button. Below this is a section titled 'Learning by Examples' with the text 'With our "Try it Yourself" editor, you can edit Python code and view the result.'

w3schools.com THE WORLD'S LARGEST WEB DEVELOPER


HTML CSS JAVASCRIPT SQL PYTHON PHP BOOTSTRAP HOW TO W3.CSS JQUERY MORE REFERENCES CERTIFICATION

Python Tutorial

- Python HOME
- Python Intro
- Python Get Started
- Python Syntax
- Python Comments
- Python Variables
- Python Data Types
- Python Numbers
- Python Casting
- Python Strings
- Python Booleans
- Python Operators
- Python Lists
- Python Tuples
- Python Sets
- Python Dictionaries
- Python If...Else
- Python While Loops
- Python For Loops
- Python Functions

Python Tutorial

< Home Next >

 Python is a programming language.
Python can be used on a server to create web applications.

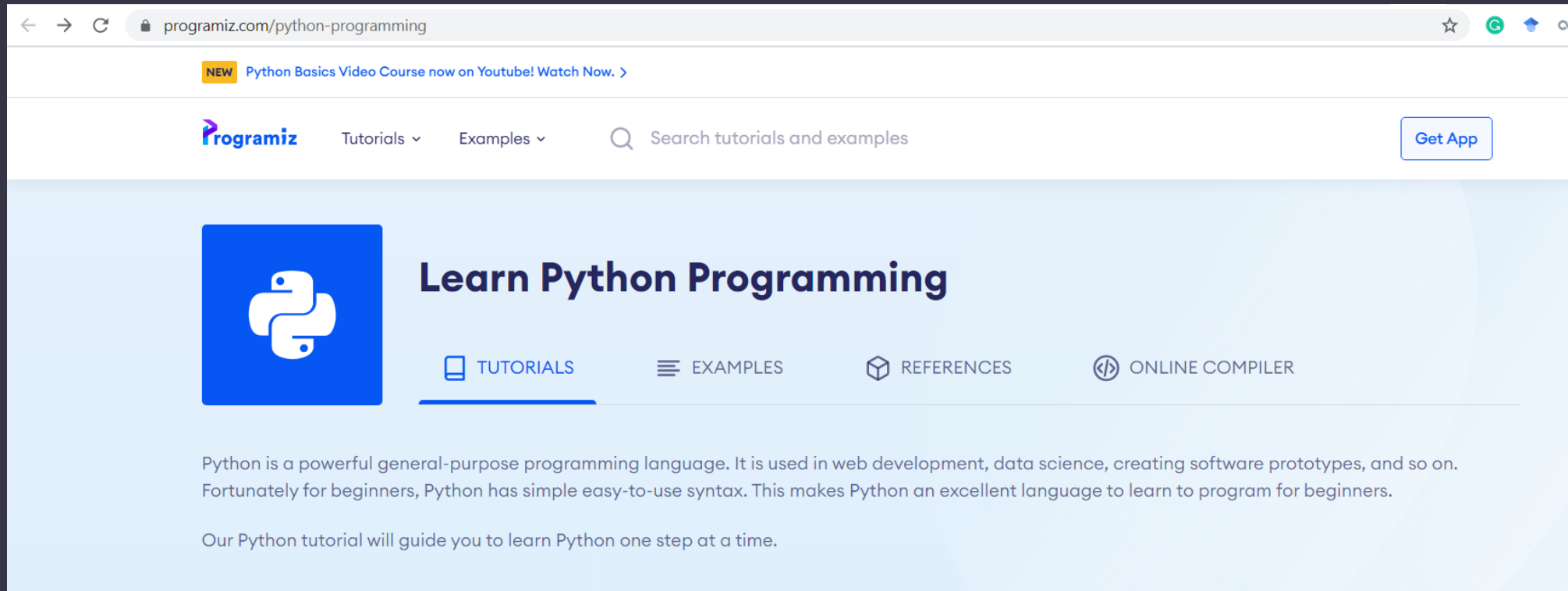
Start learning Python now >>

Learning by Examples

With our "Try it Yourself" editor, you can edit Python code and view the result.

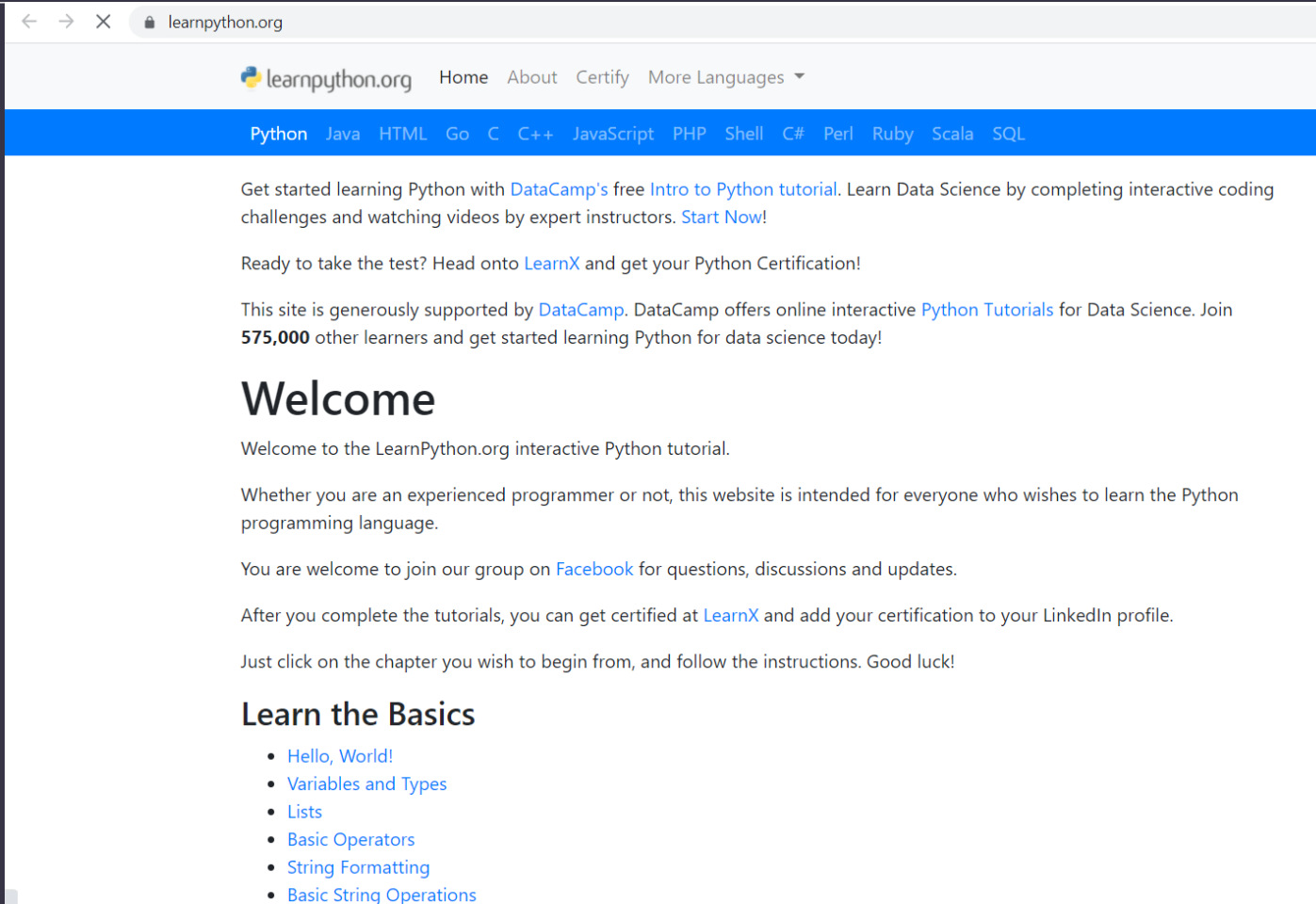
Waiting for sync-eu.connectad.io...

Programiz.com/python-programming



The screenshot shows a web browser window with the URL `programiz.com/python-programming`. At the top, there is a navigation bar with the Programiz logo, dropdown menus for "Tutorials" and "Examples", a search bar with the text "Search tutorials and examples", and a "Get App" button. Below the navigation bar, there is a large blue square containing the Python logo. To the right of the logo, the heading "Learn Python Programming" is displayed. Underneath the heading, there are four menu items: "TUTORIALS" (which is underlined), "EXAMPLES", "REFERENCES", and "ONLINE COMPILER". Below the menu items, there is a paragraph of text: "Python is a powerful general-purpose programming language. It is used in web development, data science, creating software prototypes, and so on. Fortunately for beginners, Python has simple easy-to-use syntax. This makes Python an excellent language to learn to program for beginners." Below this paragraph, there is another line of text: "Our Python tutorial will guide you to learn Python one step at a time."

https://www.learnpython.org/



The screenshot shows the homepage of learnpython.org. At the top, there is a navigation bar with the site logo and links for Home, About, Certify, and More Languages. Below this is a blue horizontal bar containing a list of programming languages: Python, Java, HTML, Go, C, C++, JavaScript, PHP, Shell, C#, Perl, Ruby, Scala, and SQL. The main content area features several paragraphs of text, including a welcome message and a list of topics under the heading 'Learn the Basics'.

learnpython.org Home About Certify More Languages ▾

Python Java HTML Go C C++ JavaScript PHP Shell C# Perl Ruby Scala SQL

Get started learning Python with [DataCamp's free Intro to Python tutorial](#). Learn Data Science by completing interactive coding challenges and watching videos by expert instructors. [Start Now!](#)

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This site is generously supported by [DataCamp](#). DataCamp offers online interactive [Python Tutorials](#) for Data Science. Join **575,000** other learners and get started learning Python for data science today!

Welcome

Welcome to the LearnPython.org interactive Python tutorial.

Whether you are an experienced programmer or not, this website is intended for everyone who wishes to learn the Python programming language.

You are welcome to join our group on [Facebook](#) for questions, discussions and updates.

After you complete the tutorials, you can get certified at [LearnX](#) and add your certification to your LinkedIn profile.

Just click on the chapter you wish to begin from, and follow the instructions. Good luck!

Learn the Basics

- [Hello, World!](#)
- [Variables and Types](#)
- [Lists](#)
- [Basic Operators](#)
- [String Formatting](#)
- [Basic String Operations](#)

Evaluation

- Assignments (5)
- Midterm Project (2)
- Quiz (4)
- TA 2
- Attendance 1
- Class activity $[-\infty, +\infty]$
- Final project (3)
 - If your grade ≥ 9 .
- Final (5)

Outline

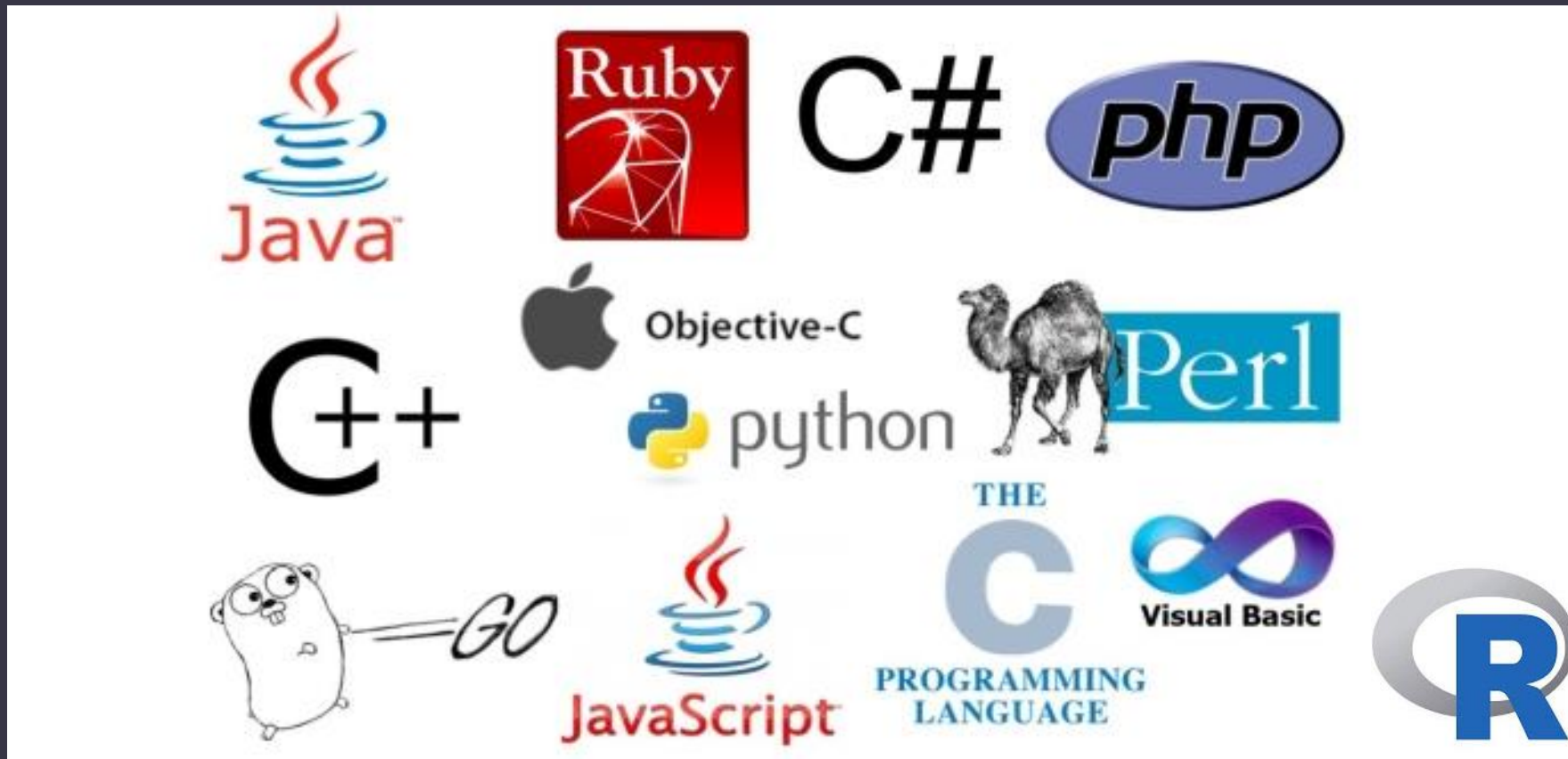
- Variables, expressions, and statements
- Loops and Iterations
- Functions
- Strings
- Files
- Lists
- Object-Oriented Programming
- Databases

“Python is an experiment in how much freedom programmers need. Too much freedom and nobody can read another's code; too little and expressiveness is endangered.”

- Guido van Rossum

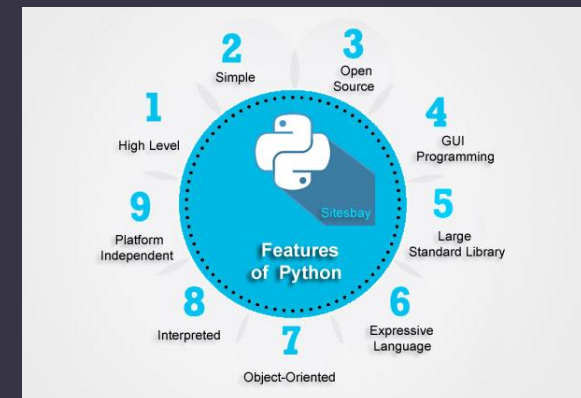


Which language?



Why Python

- *Readable and Maintainable Code*
- *Many Open Source Frameworks and Tools*
- *Python Has a Healthy, Active and Supportive Community*
- *Python Has Some Great Corporate Sponsors*
- *Python Has Big Data*
- *Python Has Amazing Libraries*
- *Python Is Reliable and Efficient*
- *Python Is Accessible*



Why Python

- **Readable and is high-level**

While writing a software application, you must focus on the quality of its source code to simplify maintenance and updates.

The syntax rules of Python allow you to express concepts without writing additional code. At the same time, Python, unlike other programming languages, emphasizes on code readability, and allows you to use English keywords instead of punctuations.

Hence, you can use Python to build custom applications without writing additional code.

The readable and clean code base will help you to maintain and update the software without putting extra time and effort.



Why Python

- **Many Open Source Frameworks and Tools**
 - Python helps you to curtail software development cost significantly.
 - You can even use several open source Python frameworks, libraries and development tools



Why Python

- **Python Has a Healthy, Active and Supportive Community**
 - It's been around for quite some time, so there's plenty of documentation, guides, tutorials and more.
 - Plus, the developer community is incredibly active. That means any time someone needs help or support, they can get it in a timely manner.



Why Python

■ Python Has Some Great Corporate Sponsors

- Python is becoming a very popular programming language and many industries are embracing and developing new applications using this language. **Google, YouTube, Netflix**, and many others are the core examples of popular companies who are using Python.
- Do you know that **Facebook**, the social media king is using Python for various developmental purposes?
- Google adopted Python heavily back in 2006, and they've used it for many platforms and applications since.
- Why does this matter? Because if companies like Google want their team — and future developers — to work with their systems and apps, they need to provide resources. In Google's case, they created a vast quantity of guides and tutorials for working with Python.

NETFLIX



You Tube



Why Python

■ Python Has Big Data

The use of big data and cloud computing solutions in the enterprise world has also helped skyrocket Python to success. It is one of the most popular languages used in data science, second only to R. It's also being used for machine learning and AI systems and various modern technologies.

Of course, it helps that Python is incredibly easy to analyze and organize into usable data.



Why Python

■ Python Has Amazing Libraries

When you're working on bigger projects, libraries can really help you save time and cut down on the initial development cycle. Python has an excellent selection of libraries, from **NumPy** and **SciPy** for scientific computing to **Django** for web development.

There are even a few libraries with a more specific focus, like **scikit-learn** for machine learning applications and **nltk** for natural language processing.

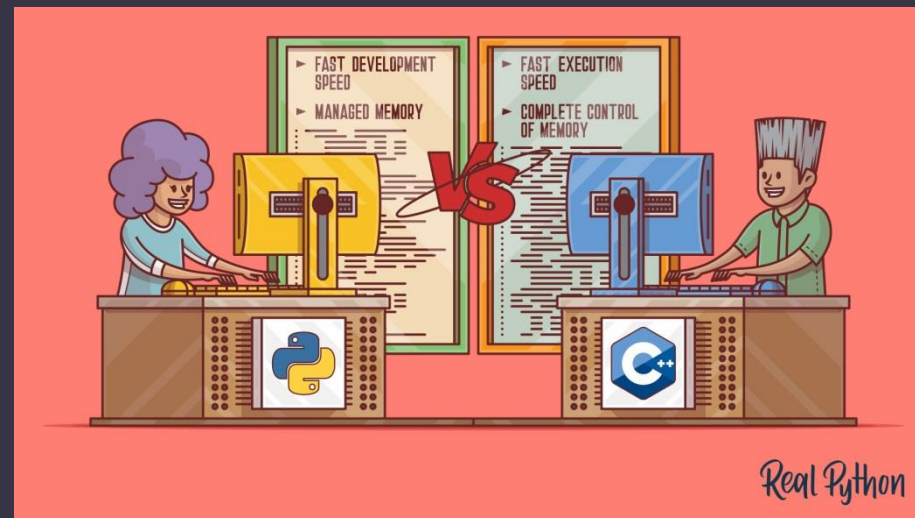


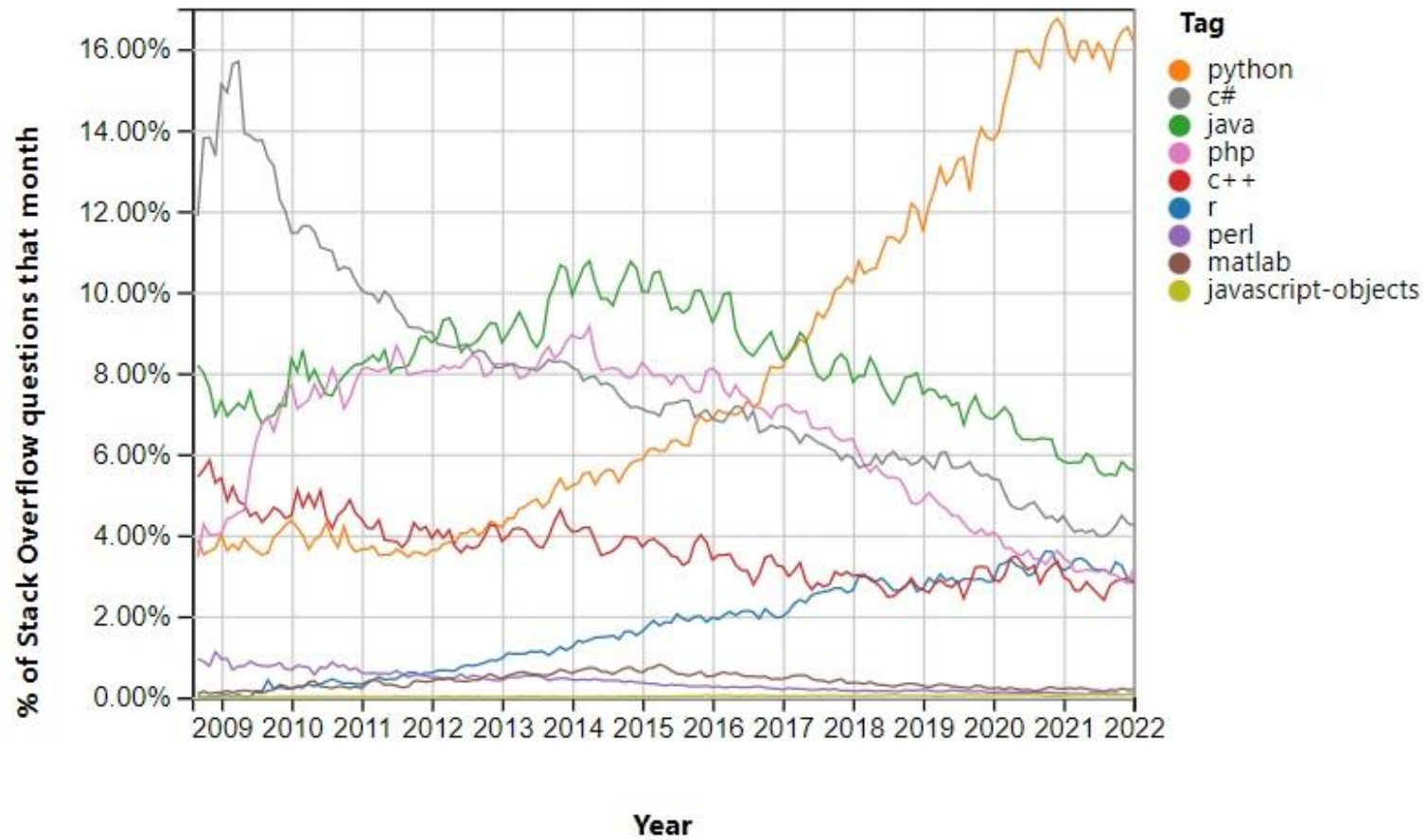
NumPy

Why Python

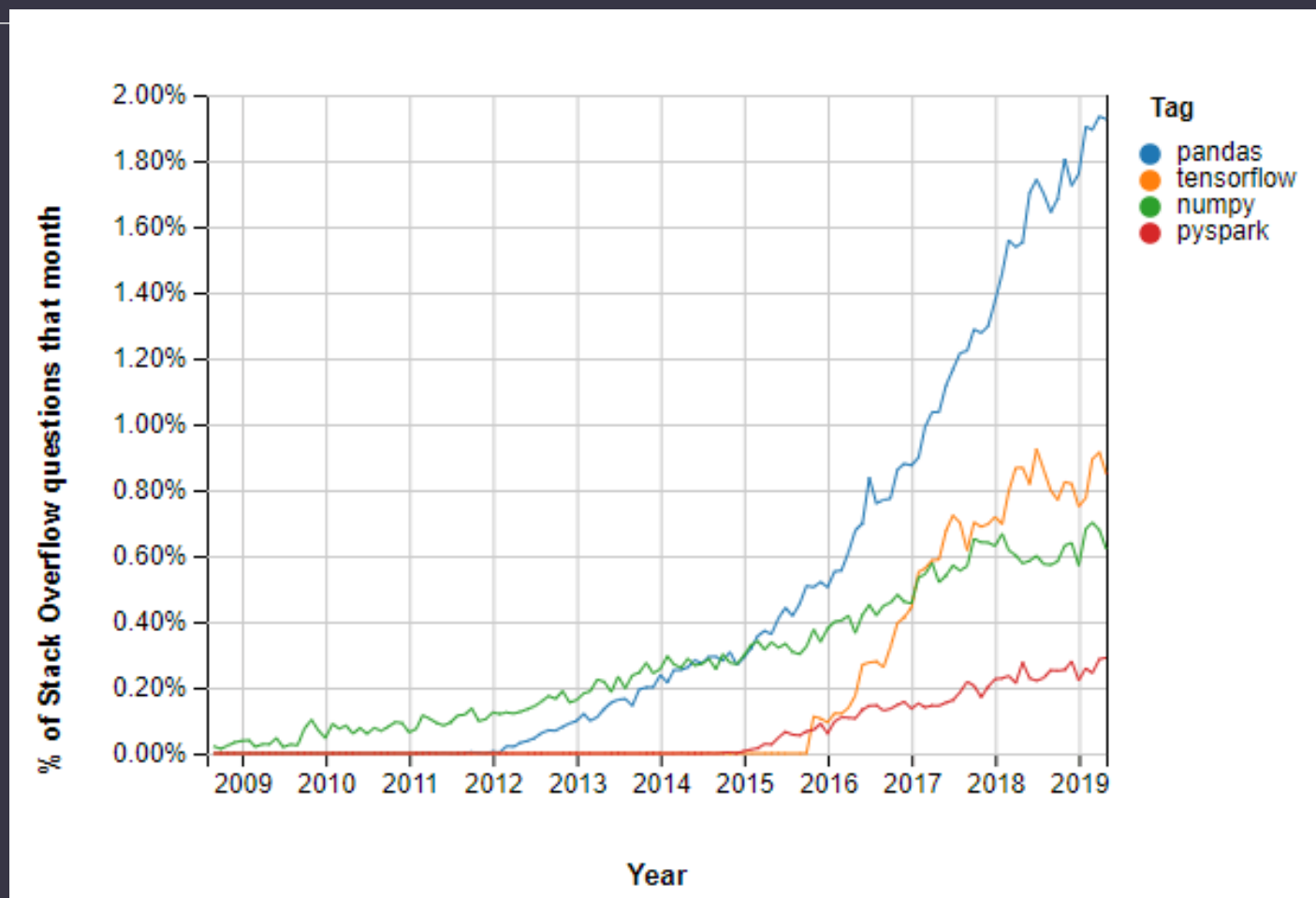
Efficient and Faster than most modern languages

Python is an efficient language and much faster than many other technologies. With its versatility Python can be used for any kind of environment, be it **mobile applications, desktop applications, or web development.**





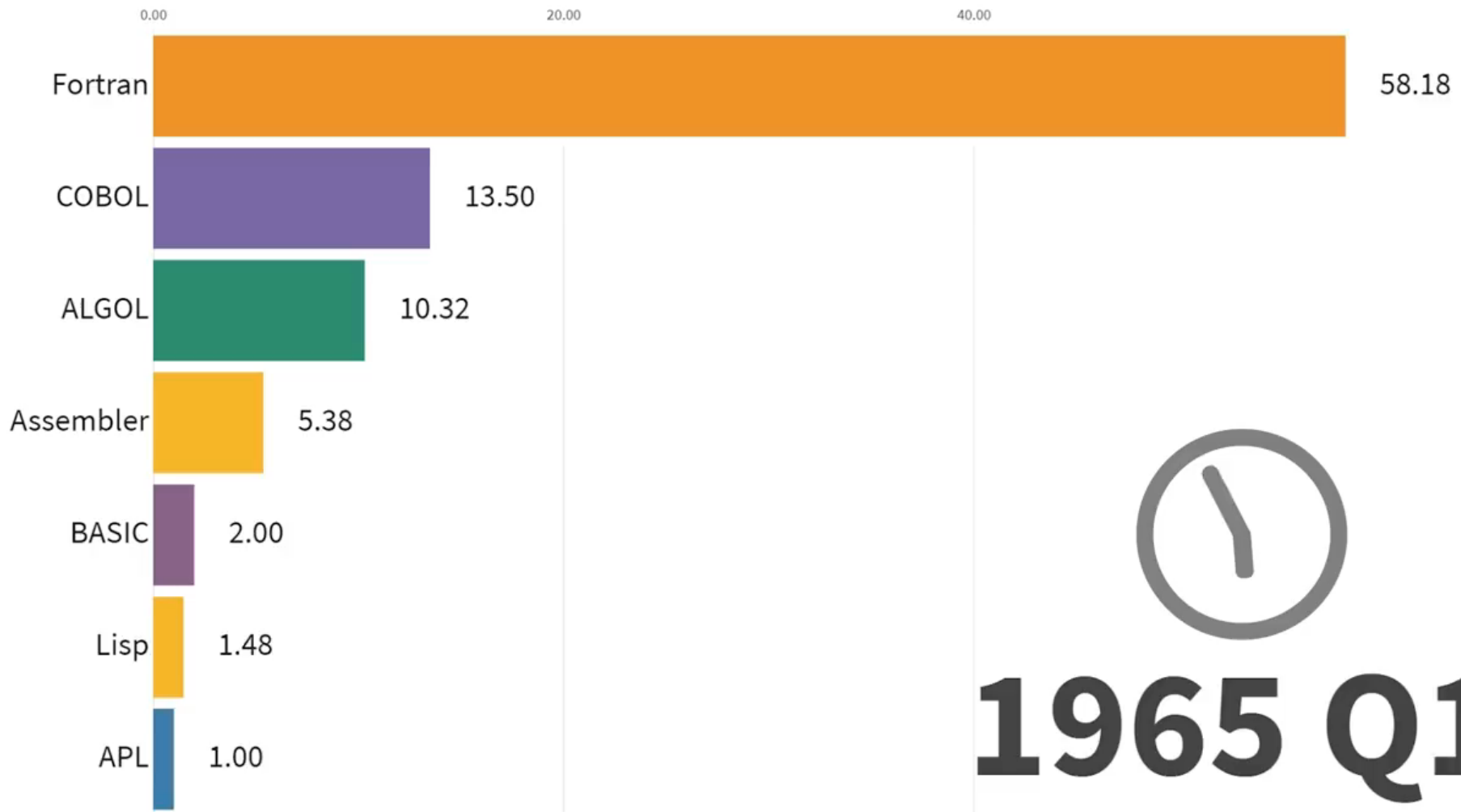
Growth of Python Machine Learning Libraries



Python

Career Opportunities





1965 Q1

// average annual developer salaries, by language, 2019



Source: Indeed.com

Python 3 vs Python 2



Python 3



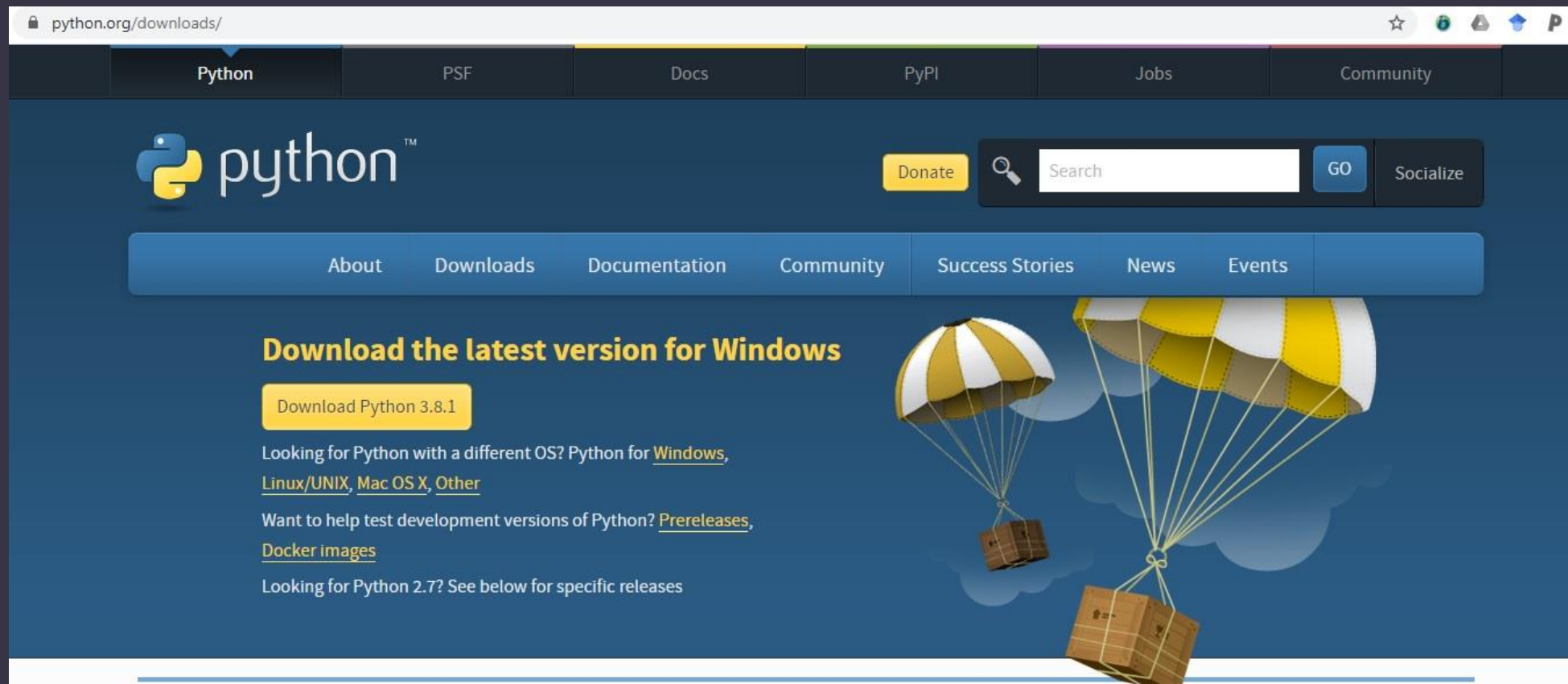
Python 2

🔗 We asked, “Which version of Python do you use the most?”. Python 3 is a strong leader with 75% and Python 2 is used as the main interpreter by only 25%.

Interesting fact

The primary use of Python 3 is growing rapidly. According to the latest research in 2016, 60% were using Python 2 compared with 40% for Python 3. Use of Python 2 is declining as it's not actively developed, doesn't get new features, and its [maintenance is going to be stopped in 2020](#).

installation



The image shows a screenshot of the Python.org/downloads page. The browser address bar shows 'python.org/downloads/'. The page has a dark blue header with navigation links: Python, PSF, Docs, PyPI, Jobs, and Community. Below the header is the Python logo, a 'Donate' button, a search bar with a 'GO' button, and a 'Socialize' button. A secondary navigation bar contains links for About, Downloads, Documentation, Community, Success Stories, News, and Events. The main content area features a large yellow button labeled 'Download Python 3.8.1' under the heading 'Download the latest version for Windows'. Below this are links for other operating systems: 'Python for Windows, Linux/UNIX, Mac OS X, Other', 'Prereleases', and 'Docker images'. A note at the bottom mentions 'Looking for Python 2.7? See below for specific releases'. On the right side of the page, there is an illustration of two yellow and white striped parachutes with cardboard boxes hanging from them, set against a blue sky with clouds.

python.org/downloads/

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python™

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Download the latest version for Windows

Download Python 3.8.1

Looking for Python with a different OS? Python for [Windows](#), [Linux/UNIX](#), [Mac OS X](#), [Other](#)

Want to help test development versions of Python? [Prereleases](#), [Docker images](#)

Looking for Python 2.7? See below for specific releases

Python Scripts

- **Interactive** Python is good for experiments and programs of 3-4 lines long.
- Most programs are much longer, so we type them into a file and tell Python to run the commands in the file.
- In a sense, we are “giving Python a script”.
- As a convention, we add “.py” as the suffix on the end of these files to indicate they contain Python.

Interactive versus Script

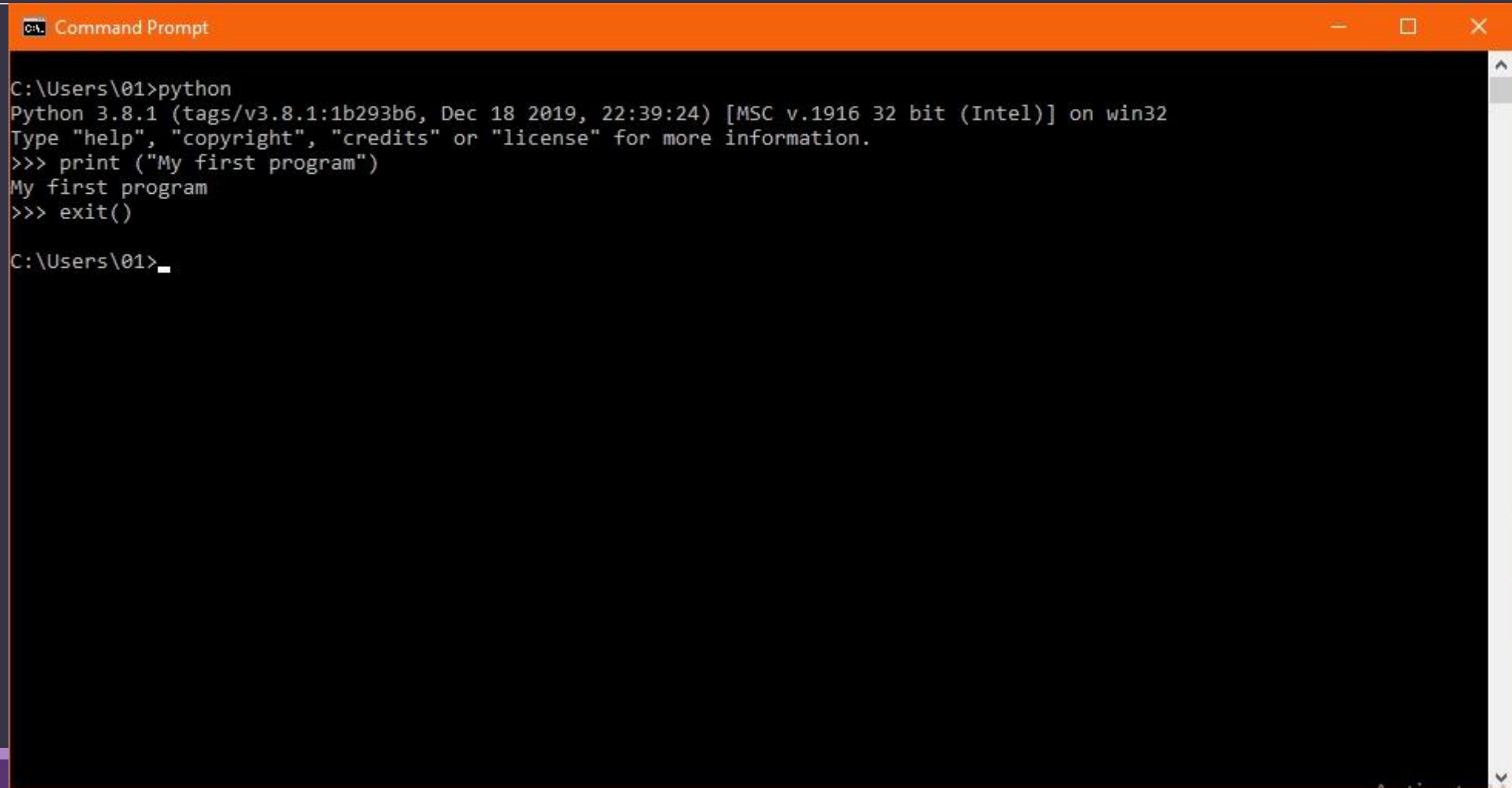
- Interactive

- You type directly to Python one line at a time and it responds

- Script

- You enter a sequence of statements (lines) into a file using a text editor and tell Python to execute the statements in the file

Using CMD



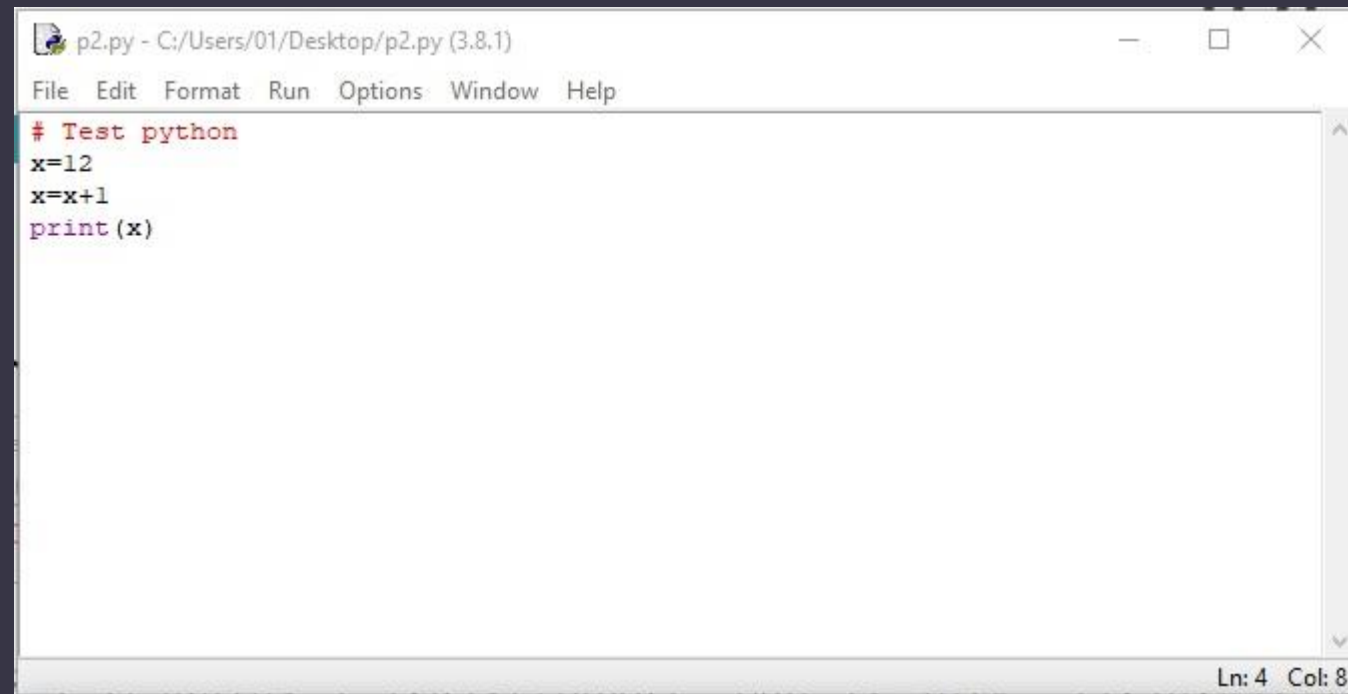
```
Command Prompt
C:\Users\01>python
Python 3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print ("My first program")
My first program
>>> exit()

C:\Users\01>_
```

Make program

- Make a new file like `p1.py` with notepad
- Save it in a specified directory
- Run CMD in the saved path
- Type: `python p1.py`

Using Idle

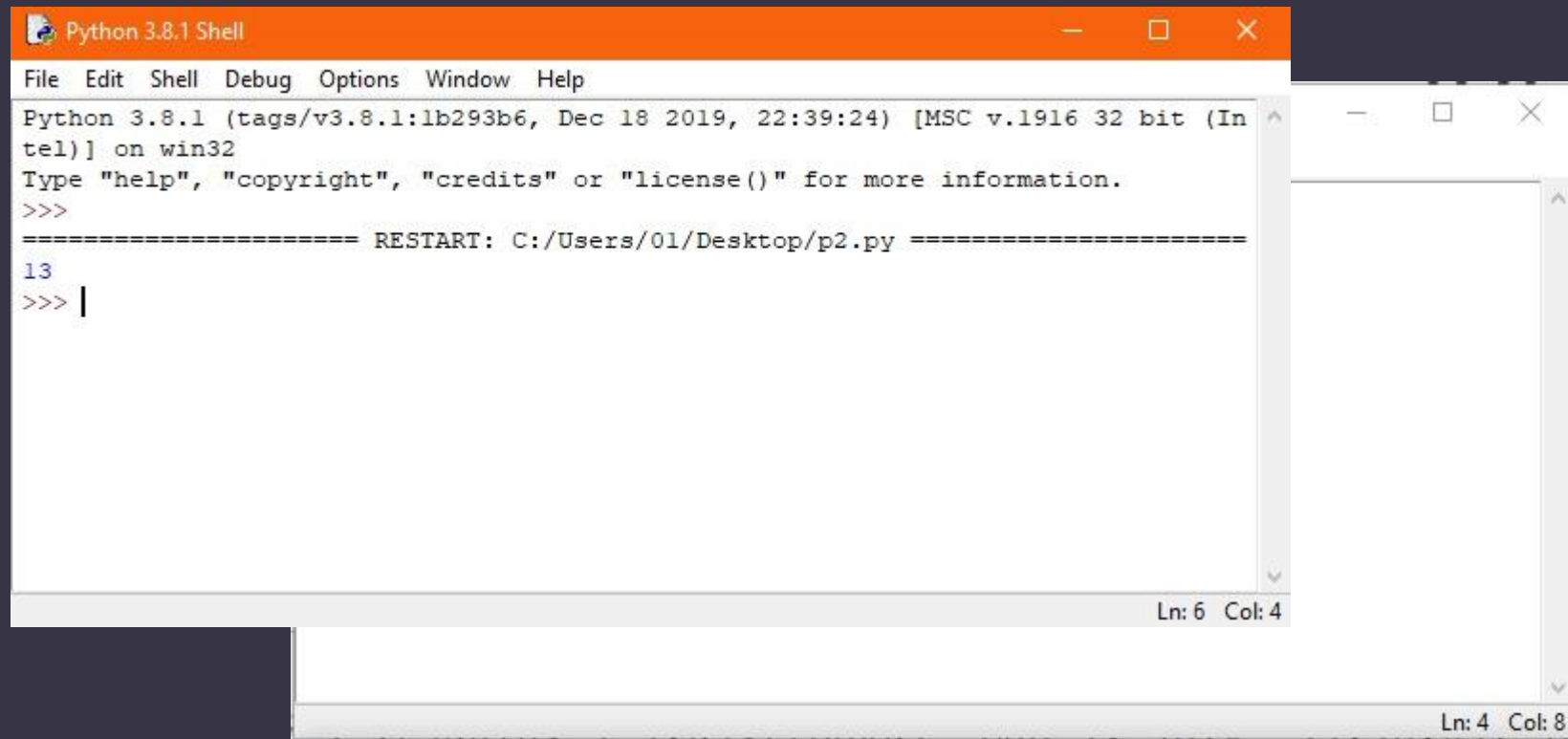


The image shows a screenshot of the Idle Python IDE window. The title bar reads "p2.py - C:/Users/01/Desktop/p2.py (3.8.1)". The menu bar includes "File", "Edit", "Format", "Run", "Options", "Window", and "Help". The main text area contains the following Python code:

```
# Test python
x=12
x=x+1
print(x)
```

The status bar at the bottom right indicates "Ln: 4 Col: 8".

Using Idle

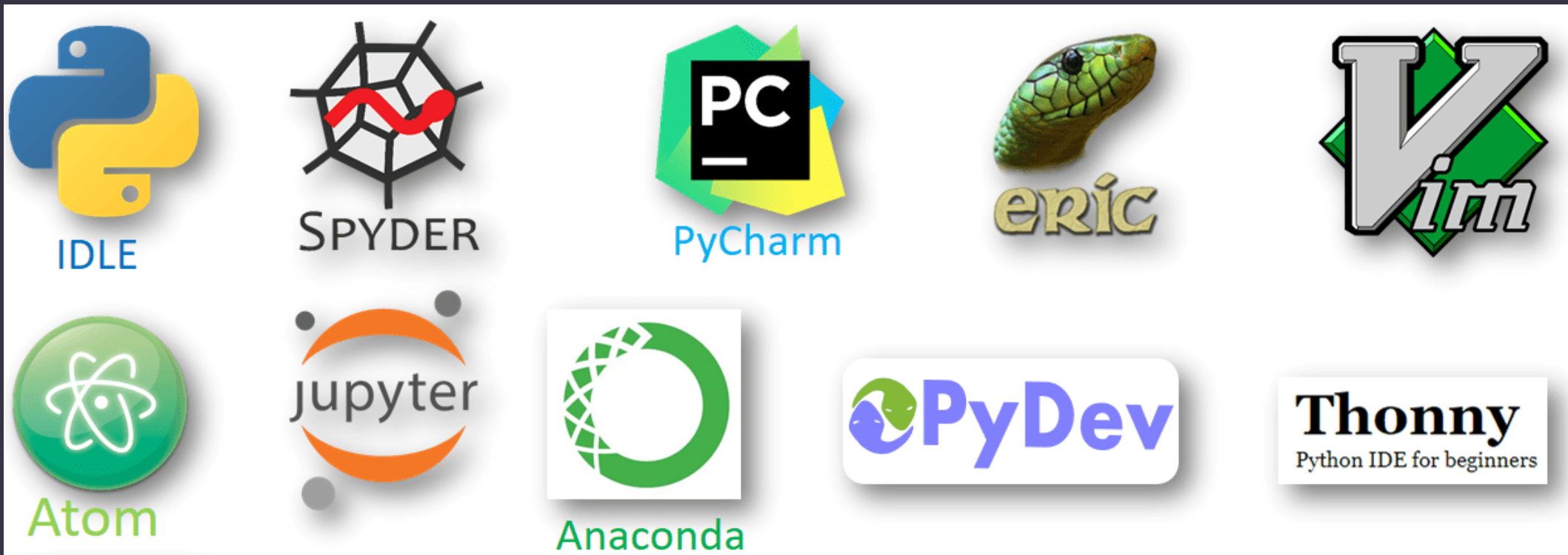


The image shows a screenshot of a Python 3.8.1 Shell window. The window title is "Python 3.8.1 Shell" and it has a menu bar with "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The main text area contains the following text:

```
Python 3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/01/Desktop/p2.py =====
13
>>> |
```

The status bar at the bottom right of the window shows "Ln: 6 Col: 4".

Integrated Development Environment (IDE)



Pycharm Environment

