Swiss UMEF
UNIVERSITY OF APPLIED SCIENCES INSTITUTE

Big Data Analytics
大数据分析

02: Introduction to Python
02：Python简介

Instructor: Oleh Tymchuk
讲师：奥勒·特姆恰克

#02: Agenda 课程安排

- What is Python?
- 什么是Python？

- Python Interpreter
- Python解释器

- IDEs (Jupyter Notebook, Google Colab)
- 集成开发环境（Jupyter Notebook、Google Colab）

- Python Practice
- Python练习

What is Python?
什么是Python？

What is Python? 什么是Python？

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics.

Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance.

Python supports modules and packages, which encourages program modularity and code reuse.

The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Python是一种解释型、面向对象的高级编程语言，具有动态语义。

Python的简单、易学的句法强调可读性，因此降低了程序维护的成本。

Python支持模块和包，这鼓励了程序的模块化和代码重用。

Python解释器和广泛的标准库可以免费获得源代码或二进制形式，适用于所有主要平台，并且可以自由分发。

Main areas where Python scripts are used
Python脚本主要应用领域

- Data analysis and machine learning 数据分析和机器学习
- Web and Internet Development Web和互联网开发
- Automation / Scripting 自动化/脚本编写
- Software testing and prototyping 软件测试和原型制作
- Everyday tasks 日常任务

TIOBE Index / Feb 2025 TIOBE指数 / 2025年2月

Feb 2025	Feb 2024	Change变化	Programming Language	
1	1			Python
2	3	↑		C++
3	4	↑		Java
4	2	↓		C
5	5			C#
6	6			JavaScript
7	7			SQL
8	8			Go
9	12	↑		Delphi/Object Pascal
10	9	↓		Visual Basic

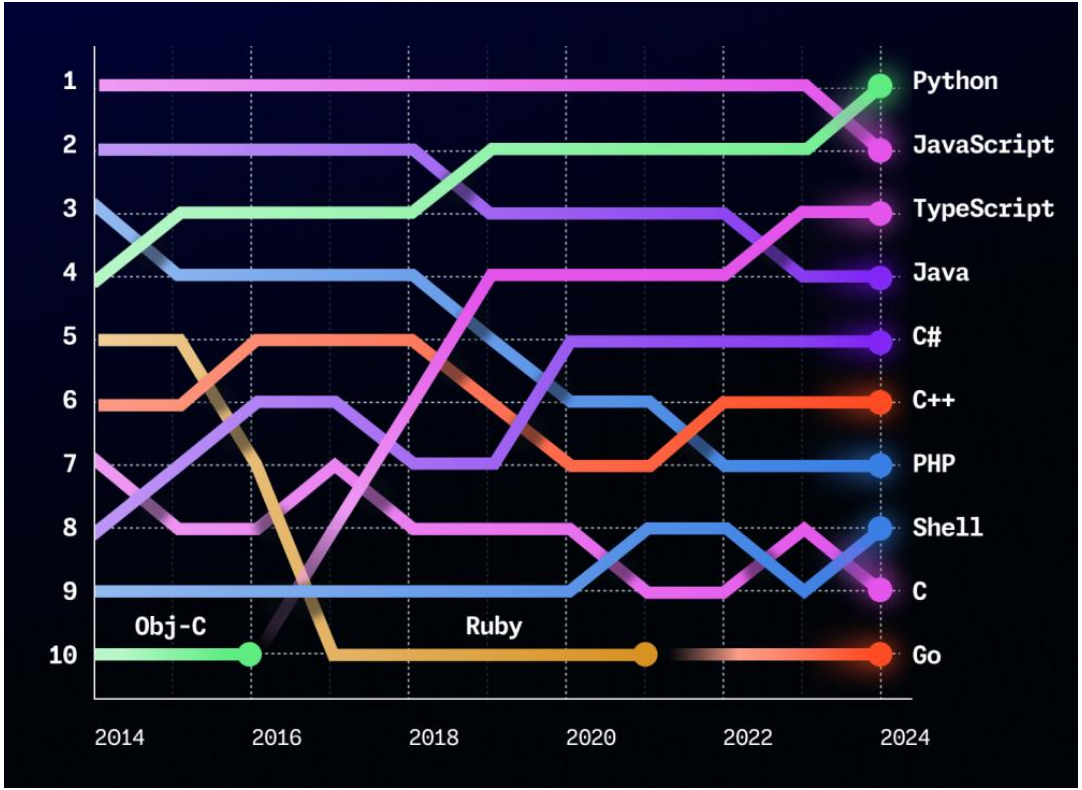
编程语言

https://www.tiobe.com/tiobe-index/

TIOBE Index / Very Long Term History TIOBE指数 / 长期历史

Programming Language 编程语言	2025	2020	2015	2010	2005	2000	1995	1990	1985
Python	1	3	7	7	7	24	23	-	-
C++	2	4	4	4	3	2	1	2	13
C	3	2	1	2	1	1	2	1	1
Java	4	1	2	1	2	3	-	-	-
C#	5	5	5	6	9	9	-	-	-
JavaScript	6	7	8	9	10	7	-	-	-
Go	7	16	36	184	-	-	-	-	-
Visual Basic	8	19	234	-	-	-	-	-	-
SQL	9	9	-	-	100	-	-	-	-
Fortran	10	30	31	25	15	18	5	8	11
PHP	13	8	6	3	5	29	-	-	-
Ada	25	35	30	26	16	17	7	4	3
Lisp	28	31	18	17	14	16	6	3	2
Objective-C	35	10	3	23	40	-	-	-	-
(Visual) Basic	-	-	77	5	4	4	3	5	4

GitHub Octoverse / 2024 （报告）



https://github.blog/news-insights/octoverse/octoverse-2024/

Top Python Libraries for Data Analysis 数据分析顶级Python库

Pandas
Data analysis and manipulation tool 数据分析和操作工具

NumPy
Numerical computing and array processing library
数值计算和数组处理库

Matplotlib
Data visualization and plotting library
数据可视化和绘图库

SeaBorn
Statistical data visualization library
统计数据可视化库

Scrapy
Web scraping and data extraction framework
网页抓取和数据提取框架

Scikit-learn
Machine learning library
机器学习库

Tensorflow
Framework for machine learning and deep learning model development
机器学习和深度学习模型开发框架

NLTK

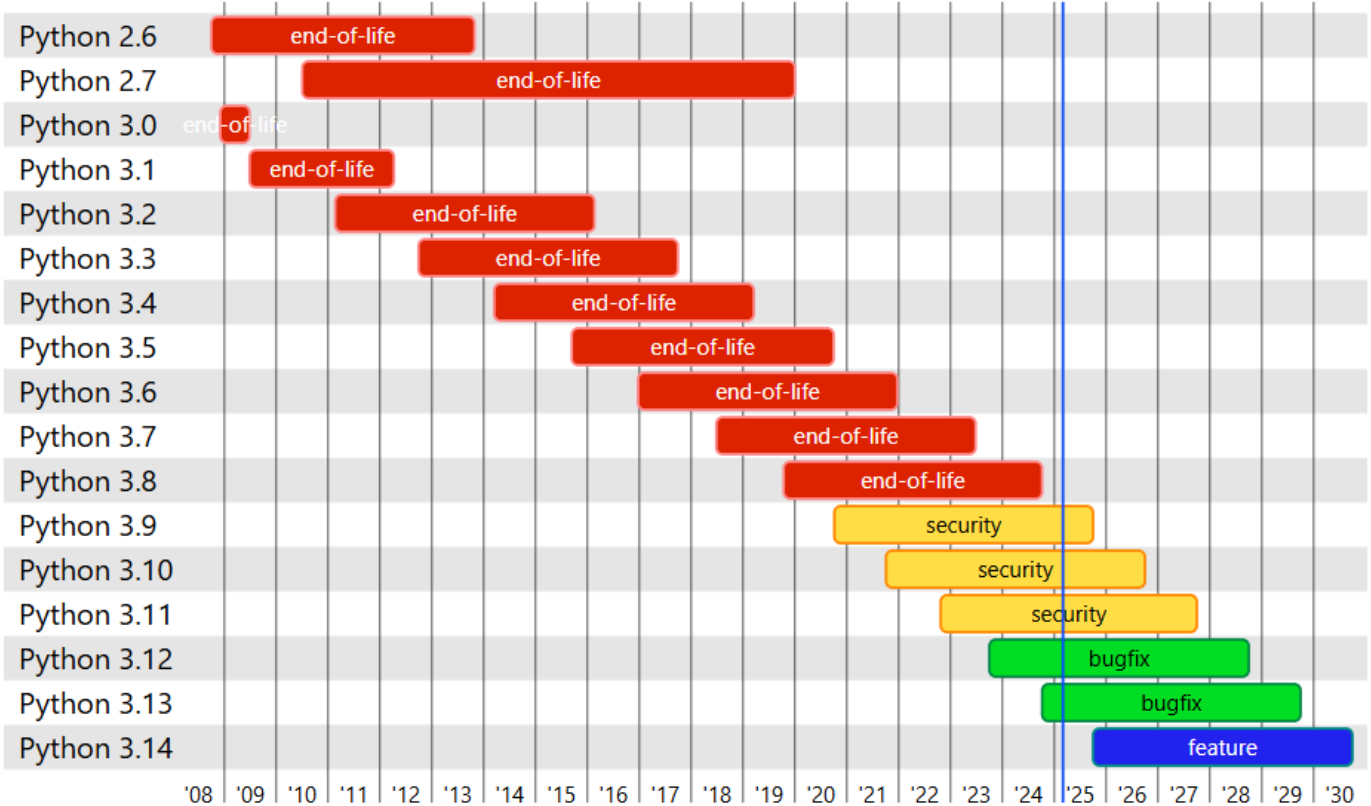
Natural Language Toolkit
Library for working with human language data 处理人类语言数据的库

Python Interpreter
Python解释器

Python Releases Python发布

Python版本 Python version	维护状态 Maintenance status	首发 First released	支持截至 End of support
3.14	pre-release	2025-10-01 (planned)	2030-10
3.13	bugfix	2024-10-07	2029-10
3.12	bugfix	2023-10-02	2028-10
3.11	security	2022-10-24	2027-10
3.10	security	2021-10-04	2026-10
3.9	security	2020-10-05	2025-10

Status of Python versions Python版本状态



停止支持
安全支持
修复bug
特性

IDEs 集成开发环境

For Developers 对于开发者

PyCharm

Visual Studio Code

For Data Analysts 对于数据分析者

Jupyter

Google Colab

Using Google Colab and Saving Results to GitHub
使用谷歌Colab并将结果保存到GitHub

1. Open Google Colab 打开谷歌Colab

Go to Google Colab. 访问网址

You can log in with your Google account. 可以使用Google账户登录。

2. Create or Open a Notebook 创建或打开笔记本

To create a new notebook, click on File > New notebook. 创建新笔记本：文件-新建笔记本

To open an existing notebook, click on File > Open notebook and choose the file from:

打开已有笔记本：文件-打开笔记本，从以下文件中选择：

Google Drive, GitHub, or upload from your local computer.

Google Drive, GitHub或从本地上传

3. Writing and Running Code 编写并运行代码

In each code cell, write your Python code and press Shift + Enter to run it.
在每个代码单元格中，编写Python代码并按Shift + Enter运行。
You can also add text cells for explanations or markdown.
您还可以添加文本单元格以进行解释或做出标记。

Python Practice
Python练习

Useful Links 实用连接

Python

https://docs.python.org/3/

https://peps.python.org/pep-0008/

IDEs 集成开发环境

https://jupyter.org/

https://colab.research.google.com/

Others… 其他……

https://colab.research.google.com/notebooks/basic_features_overview.ipynb

https://colab.research.google.com/notebooks/markdown_guide.ipynb