
techbash
Python
for .Net Developers
TechBash
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About your speaker

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20+ years in software
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About Python

First released in 1991
Developed by Guido Van Rossum
General purpose programming language, open source

CPython

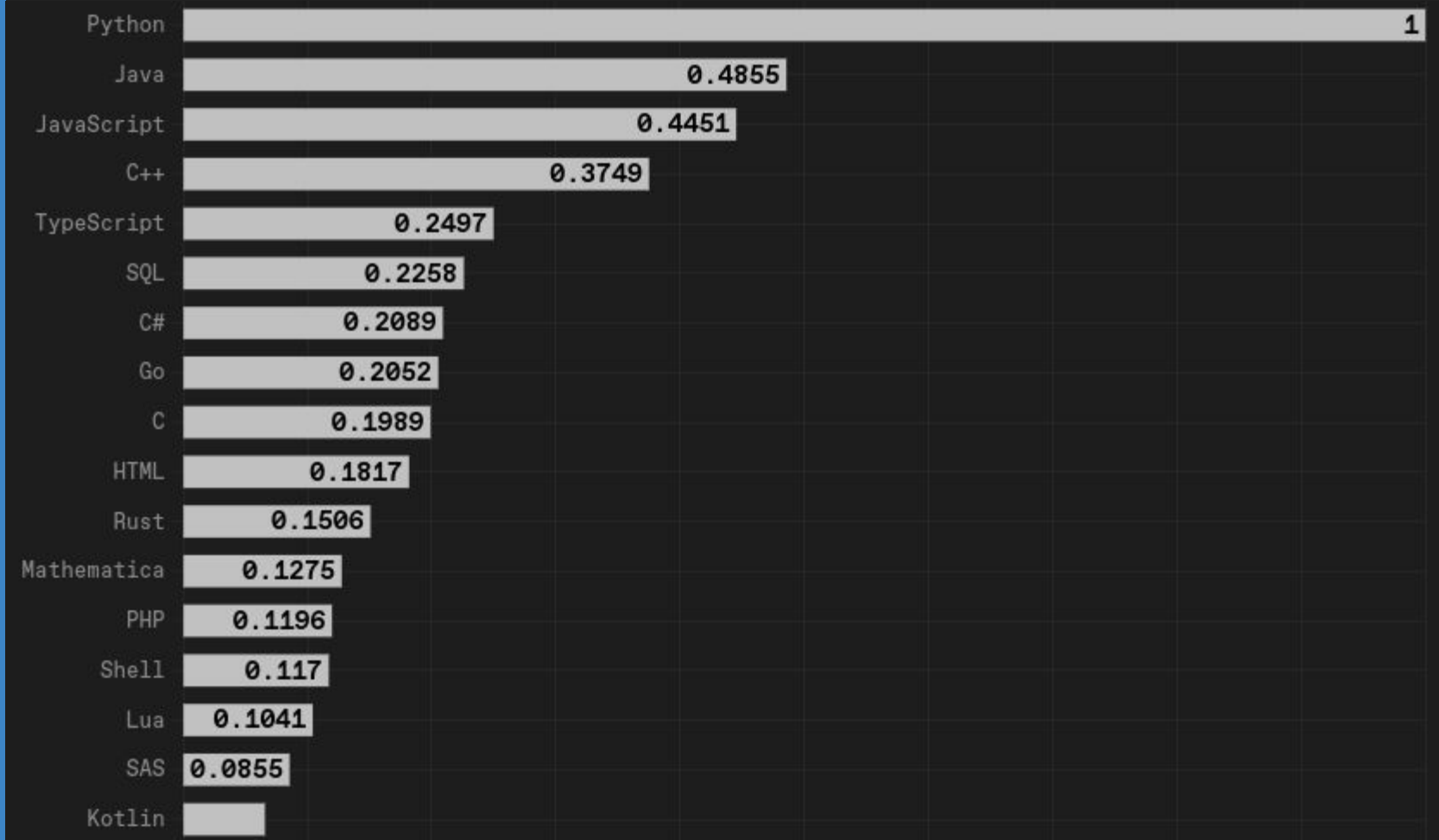
- CPython is the reference implementation for Python.
- It's partly C and partly Python.
- Python is an interpreted language when running on CPython.

Philosophy:

Emphasize simple code over complex code.
Emphasize grammar over syntax.
(See Zen of Python for more)

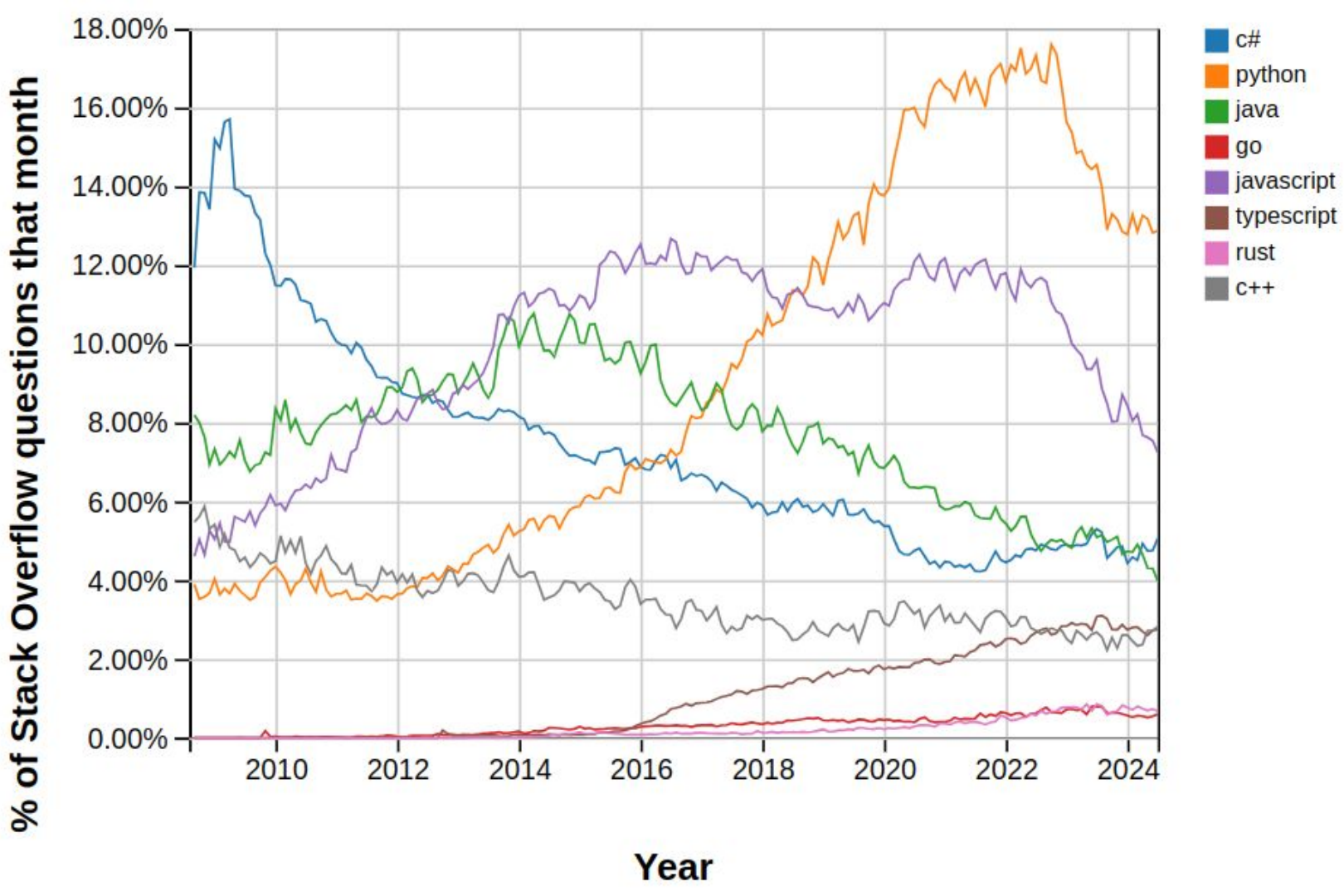
Yes, the name Python is a reference to Monty Python

Top Programming Languages 2024



IEEE

Stack Overflow



Zen of Python

Beautiful is better than ugly.
Explicit is better than implicit.
Simple is better than complex.
Complex is better than complicated.
Flat is better than nested.
Sparse is better than dense.
Readability counts.
Special cases aren't special enough to break the rules.
Errors should never pass silently, unless explicitly silenced.
In the face of ambiguity, refuse the temptation to guess.
There should be one, and preferably only one, obvious way to do it.
If the implementation is hard to explain, it's a bad idea.
If the implementation is easy to explain, it may be a good idea.

Types

3 things to know about types in Python

1. Types are always inferred
2. Types are mutable
3. Type hints are supported but there is no runtime enforcement

```
player_name = "Andre Blake"
minutes_played = 93
```

string

int

```
name_string: str = "Luca"
name_string = 44
print(name_string)
print(type(name_string))
```

string

int

```
def save_percentage(saves: int, shots_on_goal: int) -> float:
    if shots_on_goal == 0:
        return 0
    return saves / shots_on_goal
```

Packages

Python has an enormous open source community

Pypi.org is the largest package repository for Python with over 480k projects and 4.8M releases.

PIP is the most commonly used package management tool

Programming Exercise

Typing
Main
Basic syntax
Looping
The importance of whitespace
List comprehension
Using Pypi.org and PIP to install packages
Referencing packages with imports
Create a REST API
String interpolation
Built in sort and filter functions

Language comparison

	c#	**Python**
Typing	predominantly static typing	dynamic
Object Orientation	✅	✅
Functional	Partially supported	Partially supported
Procedural	✅	✅
Generics	✅	Type hinting only dev time (not runtime)
Garbage Collection	✅	✅
Syntax Type	C/C++ like, embrace the curly brace	Significant whitespace
Maintainer	Microsoft	Python Software Foundation

Ecosystem Comparison

	.Net	Python
Primary uses	Desktop, web, gaming, mobile	Data science, web, artificial intelligence, scripting, automation
Package Repository	NuGet	PyPi
Package Management Tool	Nuget Package Manager	PIP
Integrated Development Environment	Visual Studio, VS Code, Ryder	PyCharm, VS Code
Web Frameworks	ASP .Net, Blazer	Flask, Django, Pyramid, FastAPI
Testing Frameworks	MSTest, NUnit	PyTest, Testify, Unittest, DocTest
Cloud Platform Support	AWS, Azure, Google Cloud	AWS, Azure, Google Cloud
Desktop application development	WinForms, WPF, MAUI	PyQT, TKinter, Kivy

I heard Python is slow

Python is comparatively slow to some

- Interpreted, not compiled
- All variables are stored in a PyObject, which is a struct in C under the hood
- GIL (Global Interpreter Lock)

However…

- The performance of most applications is more highly impacted by IO and network latency than language run-time.
- Built-in functions and popular libraries are developed in C, to ensure high performance
- Recent and future versions of Python (3.11 through 3.13) included significant performance optimizations and improvements to threading.
- Python is very extensible. You can write your libraries in C, Rust, Go, or other languages if needed.

Python in Science, Data Science, Mathematics and Statistics

- Approachable for those without a programming background
- Powerful and broadly-adopted libraries for data ingestion, processing, calculations and analysis
- Language features which reduce the friction of working with data sets
- Jupyter Notebooks, and similar tools, provide data interactivity
- Python integration with Excel is rolling out to upcoming releases

Popular packages for data science:

- NumPy
- TensorFlow
- Pandas
- Keras
- SciPy
- Matplotlib
- Polars

Continuing your Python journey

Python.org getting started
https://www.python.org/about/gettingstarted/

Try python without installing anything: https://replit.com

Talk Python: https://training.talkpython.fm