

(1) What are the pros & cons of Python?

a) History of Python?

(1) Pros of Python

→ Easy to learn and Read

- Simple and human-friendly Syntax
- Great for beginners and non-programmers to pick up quickly

→ Versatile and general-purpose

- Can be used for web development, data science, AI/ML, automation

→ Extensive Library and Frameworks

- Huge ecosystem of Ready-made packages
- Data science: numpy, Pandas, matplotlib

→ Strong Community Support

- one of the largest programming communities in the world - easy to find tutorials, documentation and help

→ Cross-platform Compatibility

- works on windows, macOS, Linux
- write once, runs anywhere

Cons of Python

• slow Execution Speed

- python is interpreted, not compiled
- not ideal for performance-critical applications

• High memory usage

- consumes more memory: not optimal for low resource env

### 3. weak in mobile and Browser Apps.

- Rarely used for mobile app development
- not used for frontend web development

### 4. Runtime Error's

- Python is dynamically typed - easy to make type-related mistakes that only appear during execution.

### 5) Global Interpreter Lock

- limit true multi-threading in CPU-bound tasks.
- make parallel processing less efficient for heavy computation tasks.

## 2) History of Python.

### Origins and Creation (Late 1980's - Early 1990's)

Creator: Guido van Rossum,

Time: conceived in Dec 1989 and officially released in 1991

### First Release (Python 0.9.0 - Feb 1991):

- ↳ Included key features still present today:
  - functions
  - Exception handling
  - Core data types
  - modules and the import system

### Python 1.x Era (1991-2000)

- Python 1.0 (Jan 1994) introduced

- : lambda functions

- : map, filter & reduce

- : Basic error handling and OOP features

- Python 1.5 (1998): Improved stability and added more libraries

- Python 1.6 (2000):



## Python 2.x era (2000 - 2010)

- Python 2.0 released in Oct 2000
  - ↳ added garbage collection, unicode support, List Comprehensions

Problem: overtime, Python 2 and Python 3 diverged -

- Python 2 has officially discontinued on Jan 1 2020

## Python 3.x era (2008 - Present)

- It is Released in Dec 2008
- major backward-incompatible changes for cleaner design and better Unicode support
- unified text and binary data handling
- Better I/O, syntax consistency and new libraries

### notable version

→ 3.3

→ 3.5

→ 3.6

→ 3.8+

→ 3.10

→ 3.11/3.13

### key features

Virtual Env

Async/await syntax for concurrency

f-strings, Improved dict order

walrus operator (`:`), performance improvements

structural pattern matching (match-case)

massive speed boosts via cpython optimizations