Python programming language

Basic to advance

Quotes about python

- The joy of coding Python should be in seeing short, concise, readable classes that express a lot of action in a small amount of clear code -- not in reams of trivial code that bores the reader to death.

  - Guido van Rossum
- My favorite language for maintainability is Python. It has simple, clean syntax, object encapsulation, good library support, and optional named parameters.

  - Bram Cohen

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- As it seems to me, in Perl you have to be an expert to correctly make a nested data structure like, say, a list of hashes of instances. In Python, you have to be an idiot not to be able to do it, because you just write it down.

  - Peter Norvig
- In many ways, it's a dull language, borrowing solid old concepts from many other languages & styles: boring syntax, unsurprising semantics, few automatic coercions, etc etc. But that's one of the things I like about Python.

  - Tim Peters

Python Features

- Easy to learn and use
- Expressive language
- Interpreted language
- Cross platform language
- Free and open source
- Object oriented language
- Extensible
- Large standard library
- GUI programming support
- Integrated

Python history and versions

- **Python 1.0 (January 26, 1994)**:
  - Python 1.0 marked the inaugural official release of the language.
  - It introduced fundamental programming constructs like functions, modules, and exception handling.
  - While library support was somewhat limited, it laid the foundation for Python's growth.
- **Python 2.0 (October 16, 2000)**:
  - Python 2.0 ushered in features such as list comprehensions and improvements in garbage collection.
  - Importantly, it maintained backward compatibility with Python 1.0, easing the transition for existing users.

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- **Python 2.7 (July 3, 2010)**:
  - Python 2.7 served as the final release within the Python 2.x series.
  - It enjoyed extensive usage for several years but eventually reached its end of life in 2020.
- **Python 3.0 (December 3, 2008)**:
  - Python 3.0 initiated substantial changes to enhance the language's coherence and eliminate redundant elements.
  - Notably, it embraced Unicode support by default and eliminated certain idiosyncrasies from Python 2.

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- **Python 3.5 (September 13, 2015)**:
  - Python 3.5 brought forth the ‘async’ and ‘await’ keywords, empowering asynchronous programming through the ‘asyncio’ library.
  - It bolstered type hinting with ‘TypeVar’ and ‘Generic,’ promoting higher code quality.
- **Python 3.8 (October 14, 2019)**:
  - Python 3.8 introduced the ‘walrus operator’ (:=), allowing assignment expressions within larger expressions.
  - It featured enhancements in f-strings, type hints, and the ‘math’ library.

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- **Python 3.9 (October 5, 2020)**:
  - Python 3.9 unveiled the ‘zoneinfo’ module for time zone management and the ‘peg_parser’ module for parsing tasks.
  - It streamlined dictionary merging and introduced new syntax elements like ‘union’ operators for dictionaries.

What is a program?

A program is actually a sequence of instructions that specify how to perform a calculation.

Instruction’s components

- Input
- Output
- Math
- Conditional execution
- Repetition

IDE

- Integrated Development Environment

IDLE

Values and Types

8 ⟶ Integer

2.0 ⟶ floating-point number

‘Hello world!’ ⟶ string

Bugs and Debugging

- Bugs are programmer’s error

- The process of finding these errors is called debugging

Expression and statement

- Expression is a combination of values, variables and operators.

- A statement is a code unit that has an effect.