Programming with Python (JSD)

By

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Python Language – Interesting facts

Fact/Statistic	Description
Created by	Guido van Rossum
Initial release date	February 20, 1991
Latest stable release	Python 3.10.0 (October 4, 2021)
Paradigm	Multi-paradigm: object-oriented, procedural, functional
Popular use cases	Web development, data analysis, artificial intelligence, scientific computing, automation, scripting
Syntax	Easy to read, write and understand
Libraries and frameworks	A vast collection of libraries and frameworks including Django, Flask, NumPy, Pandas, TensorFlow, Keras, and many more
Popularity	Currently ranked #2 on the TIOBE Index (as of March 2023), a measure of the popularity of programming languages based on search engine results and other factors
Job demand	High job demand with many career opportunities available for Python developers
Community	Active and supportive global community with numerous resources and online forums available for learning and collaboration
Companies using Python	Many leading companies and organizations use Python, including Google, Facebook, Amazon, Dropbox, Spotify, Netflix, and NASA.

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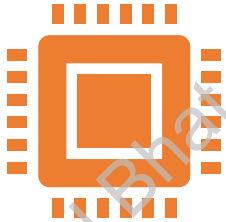
Introduction to Python Programming

Welcome to the world of Python programming!



Python is a high-level, interpreted language used in data science, machine learning, web development, scientific computing, and more.

This course will cover the basics of Python programming.

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Why Learn Python?

Python is a general-purpose and high-level programming language that can be used for various applications such as desktop GUI, web development, data analysis, machine learning, etc

Python is easy to learn and read.

It has a vast standard library with pre-built modules for many tasks.

Python supports multiple programming paradigms.

Python has a rich set of built-in data structures such as lists, tuples, dictionaries, sets, etc. that can handle complex data types and operations. It also supports dynamic typing and binding that reduces the need for declaring variables

It has a large and active community providing support and tools.

Python is used in various domains, including data science, web development, scientific computing, and more.

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Basic Features of Python

Python has a simple and intuitive syntax that emphasizes readability.

The print() function displays messages on the screen.

Python has basic data types, such as strings, integers, floating-point numbers, and Booleans.

We can assign values to variables using the = operator.

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Decision Control Structures in Python

Python has decision control structures, such as if, else, and elif, that allow us to execute different blocks of code based on different conditions.

We can use comparison operators, such as >, <, ==, !=, and others, to evaluate conditions.

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Looping Structures in Python

While	Python has two types of loops: while loops and for loops.
Continue	While loops continue as long as a condition is true.
Iterate over	For loops iterate over a sequence of values.

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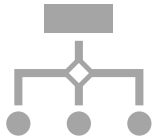
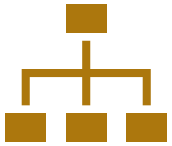
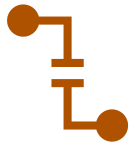
Data Structures in Python



Python has various data structures, including lists, dictionaries, and tuples.



Lists are mutable, ordered sequences of values.



Dictionaries are unordered collections of key-value pairs.

Tuples are immutable, ordered sequences of values.

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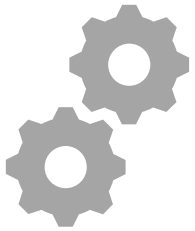
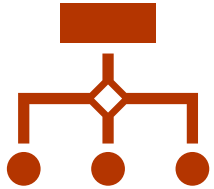
Functions in Python



Functions are reusable blocks of code that perform specific tasks.

We define functions using the def keyword.



Functions can have parameters, return values, and global and local variables.

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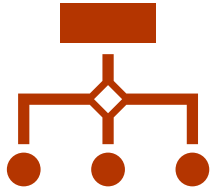
Files in Python

Python has built-in functions for working with files.

We use the open() function to open files in different modes, such as read, write, append, and more.



We can use the with a statement to automatically close files after we're done with them.

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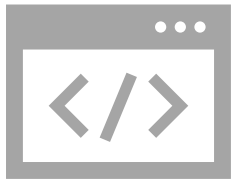
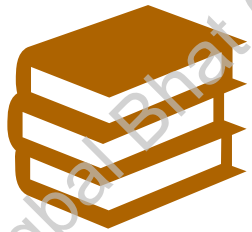
Libraries and Frameworks in Python



Python has an extensive collection of libraries and frameworks.



Libraries are collections of pre-built code that can simplify complex tasks.

Frameworks are collections of libraries that provide a structure for building applications.

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Python tools/Software

Python Interpreter: The Python Interpreter is the core component of the Python programming language that executes Python code. It's available for download from the official Python website. https://www.python.org/downloads/

PyCharm: PyCharm is an Integrated Development Environment (IDE) for Python programming that provides features such as code completion, debugging, testing, and more. https://www.jetbrains.com/pycharm/download/

Anaconda: Anaconda is a distribution of Python that comes with a collection of scientific computing packages and tools for data analysis, machine learning, and more. https://www.anaconda.com/products/distribution

Jupyter Notebook: Jupyter Notebook is a web-based interactive development environment for creating and sharing documents that contain live code, equations, visualizations, and narrative text. https://jupyter.org/install

NumPy: NumPy is a powerful Python library for numerical computing that provides support for large, multi-dimensional arrays and matrices, along with a variety of mathematical functions. https://numpy.org/install/

Pandas: Pandas is a library for data manipulation and analysis in Python that provides data structures for efficiently storing and processing large datasets. https://pandas.pydata.org/docs/getting_started/install.html

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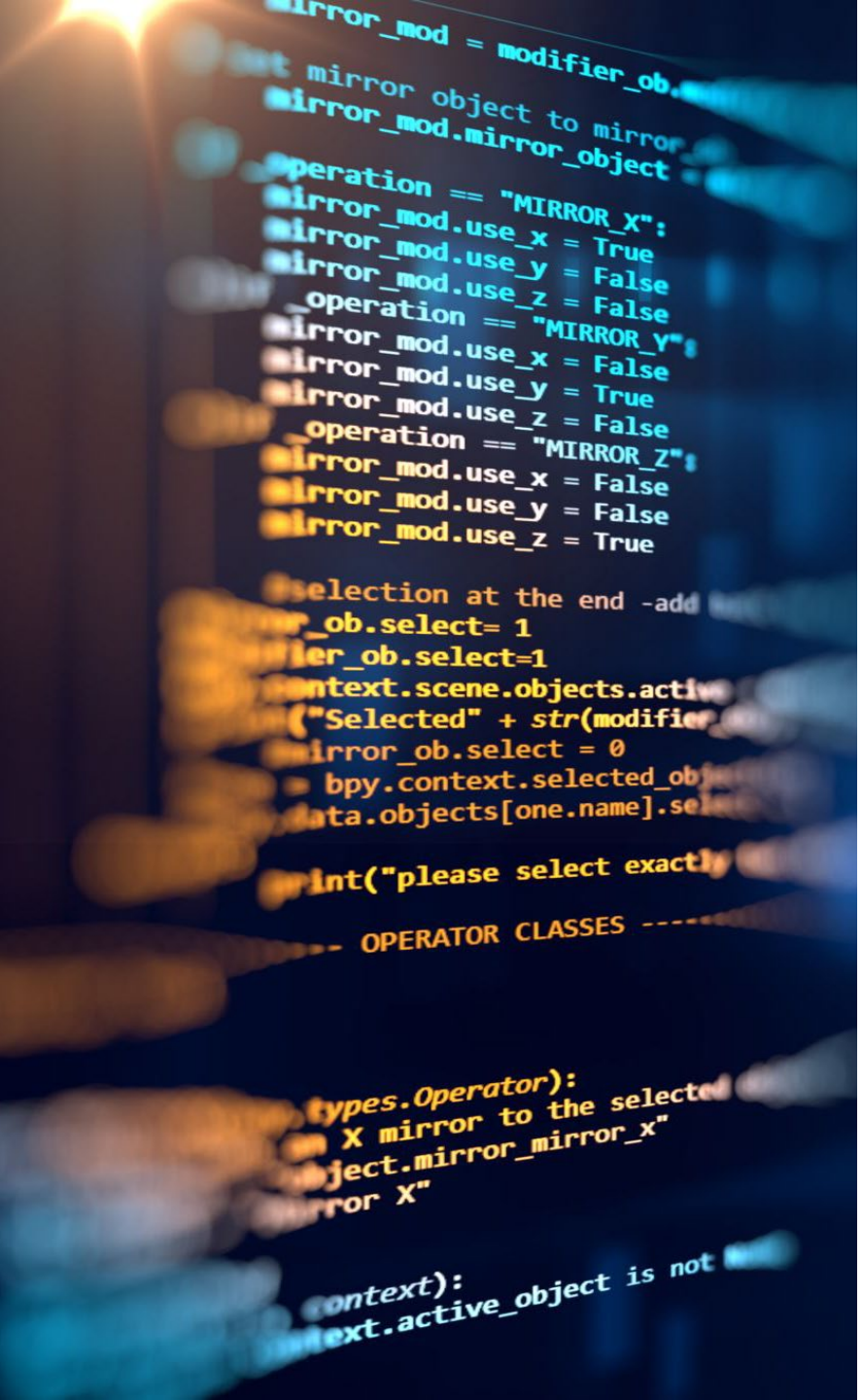

Conclusion

- Python is an exciting language to learn.
- With regular practice and persistence, anyone can learn Python.
- Programming is not just about writing code but also about problem-solving, critical thinking, and creativity.
- By learning Python, you'll open up many opportunities and career paths.

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Slide 11: References

- Here are some useful resources to learn more about Python:
- Python.org
- w3schools.com/python/
- https://nptel.ac.in/courses
- DataCamp.com
- Udemy.com/topic/python/

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