

Python Programming – Informational Knowledge Base

Python is a high-level, interpreted programming language known for its simplicity and readability. It was created by Guido van Rossum and is widely used in many areas of software development. Python uses indentation to define code blocks, which improves code readability and enforces a clean coding style. Programs written in Python are easy to understand and maintain.

Variables in Python are used to store data values. Python does not require explicit data type declarations, as it uses dynamic typing. The type of a variable is determined at runtime.

Python supports several built-in data types. These include integers for whole numbers, floats for decimal values, strings for text data, and booleans for true or false values.

Collections in Python allow storage of multiple values. Lists are ordered and mutable collections.

Tuples are ordered but immutable. Sets are unordered collections that store unique elements.

Dictionaries store data as key-value pairs.

Operators in Python include arithmetic operators for calculations, comparison operators for comparing values, logical operators for boolean logic, and assignment operators for assigning values to variables.

Conditional statements allow decision-making in programs. Python uses if, elif, and else statements to execute code based on conditions.

Loops are used to repeat code execution. A for loop is commonly used to iterate over sequences, while a while loop continues execution as long as a condition is true.

Functions are reusable blocks of code that perform specific tasks. They help in reducing code repetition and improving modularity. Functions can accept parameters and return values.

Python supports object-oriented programming. Classes are used to create objects, and objects represent real-world entities. Concepts such as inheritance, encapsulation, and polymorphism are supported.

Exception handling is used to manage runtime errors. Python uses try, except, else, and finally blocks to handle exceptions gracefully without crashing the program.

File handling in Python allows programs to read from and write to files. Common operations include opening a file, reading content, writing data, and closing the file.

Modules are files containing Python code that can be reused in other programs. Python also provides a large standard library with built-in modules for various tasks.

Python is widely used in web development, data science, machine learning, artificial intelligence, automation, scientific computing, and software development.

Due to its simplicity and powerful features, Python is often recommended as a first programming language for beginners and is also used extensively in professional environments.