

Data types, Variables, Type Casting

In Python, variables are used to store data values. Data types in Python include integers, floats, strings, lists, tuples, dictionaries, etc., which define the type of data a variable can hold.

Type casting is the process of converting a variable from one data type to another. For example, you can convert an integer to a string using `str()`, a string to an integer using `int()`, or a float to an integer using `int()`.

Understanding data types, variables, and type casting is essential for managing and manipulating data effectively in Python.

In Python, there are several data types that are commonly used:

1- Numeric Types: as int , float

2- String Type:

str: Represents a sequence of characters enclosed in single, double, or triple quotes.

3- Boolean Type:

bool: Represents Boolean values True and False.

4- Sequence Types: as list , tuple, range.

5- Mapping Type:

dict: Collection of key-value pairs, e.g., {'key1': 'value1', 'key2': 'value2'}

Input & Output

- ▶ In Python, you can take input from the user using the ``input()`` function, which reads a line from the input and converts it to a string.
- ▶ For output, you can use the ``print()`` function to display information to the user. You can provide multiple values to ``print()`` separated by commas to display them together.

These functions are commonly used for handling input and output operations in Python programs.

Conditions & Loops

- ▶ In Python, conditions are managed using ``if``, ``elif``, and ``else`` statements to execute code based on specific conditions.
 - The ``if`` statement is used to execute a block of code if a specified condition is true.
 - The ``elif`` statement allows you to check multiple expressions for truth and execute a block of code as soon as one of the conditions is true.
 - The ``else`` statement executes a block of code if the preceding conditions are not true.
- ▶ Loops, such as ``for`` and ``while`` loops, are used for iteration:
 - A ``for`` loop is used for iterating over a sequence (such as a list, tuple, or string) or other iterable objects.
 - A ``while`` loop is used to repeatedly execute a block of code as long as the specified condition is true.
- ▶ These constructs are essential for controlling program flow and handling repetitive tasks efficiently in Python.

Math library & Strings

- ▶ In Python, the ``math`` library provides mathematical functions and constants. You can use functions like ``sqrt()`` for square root, ``sin()`` for sine, ``cos()`` for cosine, etc. It also includes constants like ``pi`` and ``e``.
- ▶ Strings in Python are sequences of characters enclosed in single, double, or triple quotes. You can manipulate strings using various methods like slicing, concatenation, formatting, etc. Python provides a wide range of string methods for operations such as finding substrings, converting cases, and replacing text within strings.