Introduction to Python: Variables, Data Types, Operators, and Expressions

# 1. Python Variables

A variable in Python is a named location used to store data in memory. It can change during the program's execution. Python variables do not require type declaration.

Rules for Naming Variables:

|  |  |
| --- | --- |
| Concept | Description |
| Rule 1 | Must start with a letter or an underscore (\_) |
| Rule 2 | Cannot start with a number |
| Rule 3 | Can only contain letters, numbers, and underscores |
| Rule 4 | Case-sensitive (e.g., 'Name' and 'name' are different variables) |

# 2. Python Data Types

Python provides several built-in data types to handle different kinds of data. Here are the basic and complex data types:

|  |  |
| --- | --- |
| Concept | Description |
| int | Integer (whole numbers) - Example: 10, -5 |
| float | Floating-point numbers (decimals) - Example: 3.14, -2.5 |
| str | String (text) - Example: 'Hello' |
| bool | Boolean (True/False) - Example: True, False |
| list | Ordered collection - Example: [1, 2, 3] |
| tuple | Immutable collection - Example: (1, 2, 3) |
| set | Unordered collection - Example: {1, 2, 3} |
| dict | Key-value pairs - Example: {'key': 'value'} |

# 3. Python Operators

Operators are symbols used to perform operations on variables and values. Python supports several types of operators:

|  |  |
| --- | --- |
| Concept | Description |
| Arithmetic Operators | +, -, \*, /, //, %, \*\* |
| Comparison Operators | ==, !=, >, <, >=, <= |
| Logical Operators | and, or, not |
| Assignment Operators | =, +=, -=, \*=, /= |

# 4. Python Expressions

An expression is a combination of variables, operators, and values that produces a result. Python expressions can be simple or complex and are used to compute values.

# 5. Type Conversion

Python allows converting between different data types using built-in functions like int(), float(), str(), and bool().

# 6. Input and Output

Python provides simple functions for input and output operations. The input() function takes input from the user, while the print() function displays output.

# Conclusion

In this guide, you learned about Python's fundamental concepts:  
1. Variables: Used to store data.  
2. Data Types: Different types of data like int, float, str, etc.  
3. Operators: Used to perform operations on data.  
4. Expressions: Combinations of values, variables, and operators to compute results.  
5. Type Conversion: Converting between different data types.  
6. Input and Output: Taking user input and displaying output.