

# Python Basics Questions

## 1. What is Python, and why is it popular?

Python is a high-level, interpreted programming language that is easy to read and write. It is widely used for web development, data analysis, artificial intelligence, automation, and many other applications.

Python is popular because of its simple syntax, large community support, and extensive libraries, which make programming faster and more efficient.

## 2. What is an interpreter in Python?

An interpreter is a program that reads and executes Python code line by line. It converts the Python instructions into machine-readable form so the computer can perform the tasks immediately. Unlike a compiler, it does not create a separate file; it runs the code directly.

## 3. What are pre-defined keywords in Python?

Pre-defined keywords are reserved words in Python that have a special meaning.

They are part of the Python language and can not be used as variable names.

Examples : if, else, while, for, continue, etc.

These keywords are used to write the structure and logic of a Python program.

#### 4. Can keywords be used as variable names?

No, keywords can not be used as variable names because keywords are pre-defined/reserved words in Python that have a special meaning and used to write the structure and logic.

#### 5. What is mutability in Python?

Mutability refers to whether the value of an object can be changed after it is created.

Examples : list, set, dictionary can be changed after it is created whereas string, tuple, int can not be changed after it is created.

#### 6. Why are lists mutable, but tuples are immutable?

**Lists** are mutable because their elements can be changed, added or removed after the list is created.

For example, you can add a new item to a list or change an existing item.

**Tuples** are immutable because once they are created, their elements can not be changed, added or removed.

This makes Tuple fixed and unchangeable, which can be useful for data that should not be modified.

#### 7. What is the difference between “==” and “is” operators in Python?

“==” operator is used to check if the values of two objects are equal. It looks at what is inside the objects.

For example: `a = [1,2]`  
`b = [1,2]`  
`a = b` #output: True

“is” operator is used to check if two objects are the same object in memory.

It looks at whether both objects are actually the same object in memory.

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For example:    a = [1,2]
                 b = [1,2]
                 a is b    #output:  False
```

## 8. What are logical operators in Python?

Logical operators help us combine or modify conditions in Python. They always give a True or False result.

There are 3 types of logical operators:

- “and” Operator: True only if both conditions are True.
- “or” Operator: True if at least one condition is True.
- “not” Operator: Flips True to False or False to True

## 9. What is type casting in Python?

Type casting is the process of converting a value from one data type to another. This allows you to perform operations that require a specific type of data.

Common type of casting functions:

- `int()`: to convert into integer
- `float()`: to convert into float
- `str()`: to convert into string
- `list()`: to convert into list
- `tuple()`: to convert into tuple

## 10. What is the difference between implicit and explicit type casting?

**Implicit Type Casting** is performed automatically by Python without any user intervention.

It typically occurs when operations involve multiple data types, and python converts the “smaller” or less precise data type to a “larger” or more precise type to prevent data loss.

For example, adding an int and float converts the int to a float.

**Explicit Type Casting** is performed manually by the programmer using built-in functions such as `int()`, `float()`, or `str()`. This provides full control over the conversion process.

For example, converting “10”(string) to 10(integer) using `int(“10”)`.

## 11. What is the purpose of conditional statements in Python?

The purpose of conditional statements is to allow a program to make decisions and execute different blocks of code based on whether a condition is True or False.

They help control the flow of execution so the program can respond to different situations dynamically.

## 12. How does the elif statement work?

The **elif** statement allows you to check multiple conditions in sequence.

Python evaluates each condition from top to bottom.

As soon as it finds a condition that is True, it executes that block of code and skip the rest.

If none of the conditions are True, the **else** block is executed.

### **13. What is the difference between for and while loops?**

“for” Loop in Python:

Used when the number of iterations is known.

Commonly used to iterate over sequences like lists, tuples, strings, or ranges.

Best suited for sequential tasks where we know how many times the loop should run.

“while” Loop in Python:

Used when the number of iterations is not known in advance.

Continues execution as long as the given condition is True.

Best suited for condition-based tasks, like waiting for user input or repeating until an event occurs.

### **14. Describe a scenario where a while loop is more suitable than a for loop.**

Suppose we are writing a program that keeps asking a user to enter the correct password. Since we do not know how many attempts the user will take, a “while” loop is the better choice.

Here, the loop will run indefinitely until the user enters the correct password. Using a “for” loop would not be practical, because we cannot predict how many attempts might be needed.

**Thank you** 😊

