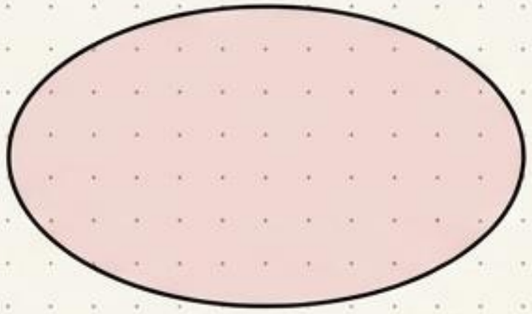
INDIAN SCHOOL AL WADI AL KABIR

INTRODUCTION TO PYTHON
CLASS IX-CT&AI

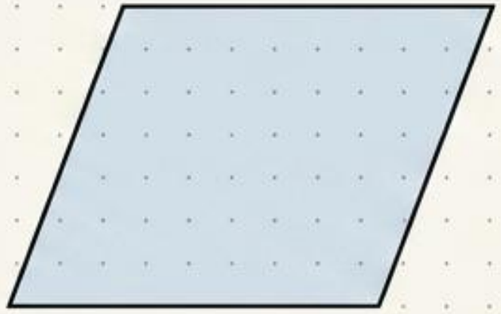
Sketching the Blueprint: Algorithms & Flowcharts

An algorithm is a logical, step-by-step method to solve a problem. We represent these visually using flowcharts—the fundamental blueprints of machine logic.



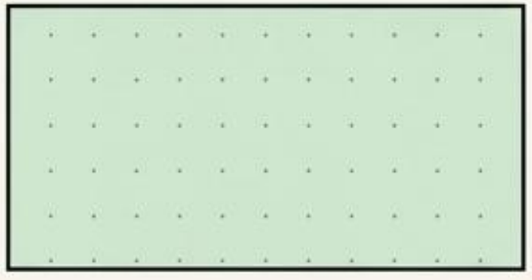
Terminal Box

Start / End initiation.



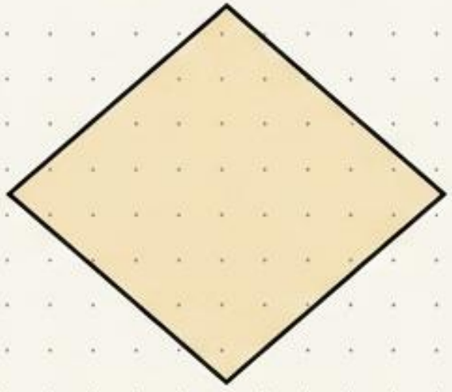
Input / Output

Reading data or printing results.



Process / Instruction

Mathematical calculations or actions.



Decision

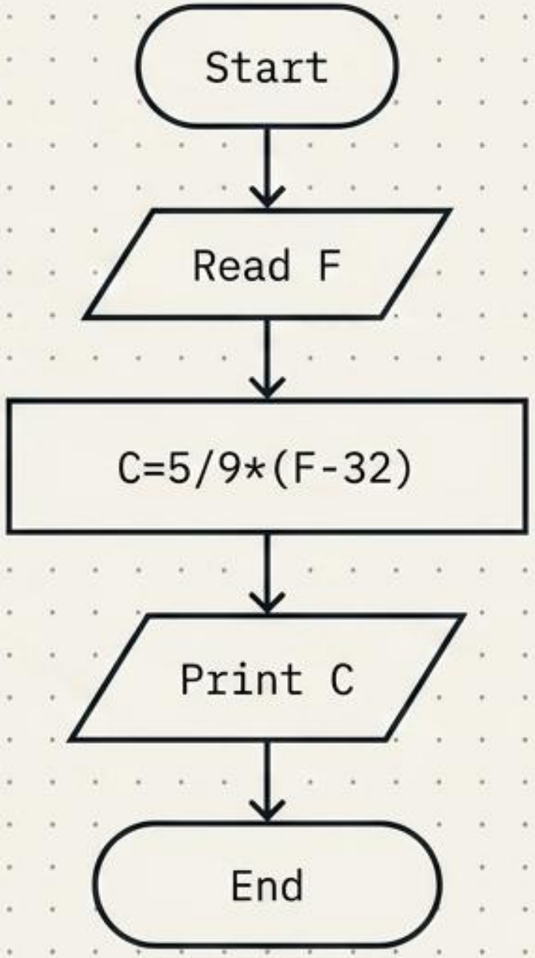
True/False branching conditions.

The Blueprint in Action: Temperature Conversion

Algorithm

```
Step 1: Read temperature in Fahrenheit
Step 2: Calculate using C=5/9*(F-32)
Step 3: Print C
```

Flowchart



Python: The Builder's Language

Why is Python the dominant language for Artificial Intelligence?

Easy to Learn

Simple structure, highly readable syntax.

Standard Library

A massive arsenal of built-in functions.

Interactive Mode

Instant testing and debugging of code snippets.

Portability

Runs universally across Windows, macOS, and Linux.

Extendable

Allows low-level modules to customize performance.

Scalable

Built to handle massive databases and heavy AI scripting.

The Workbench: Two Ways to Code

Interactive Mode

- Instant execution
- Great for quick testing
- Uses the >>> prompt
- Code is not permanently saved

Script Mode

- Code is written into a file
- Executed all at once
- Ideal for complex programs
- Easily modifiable and reusable

Python Statement and Comments

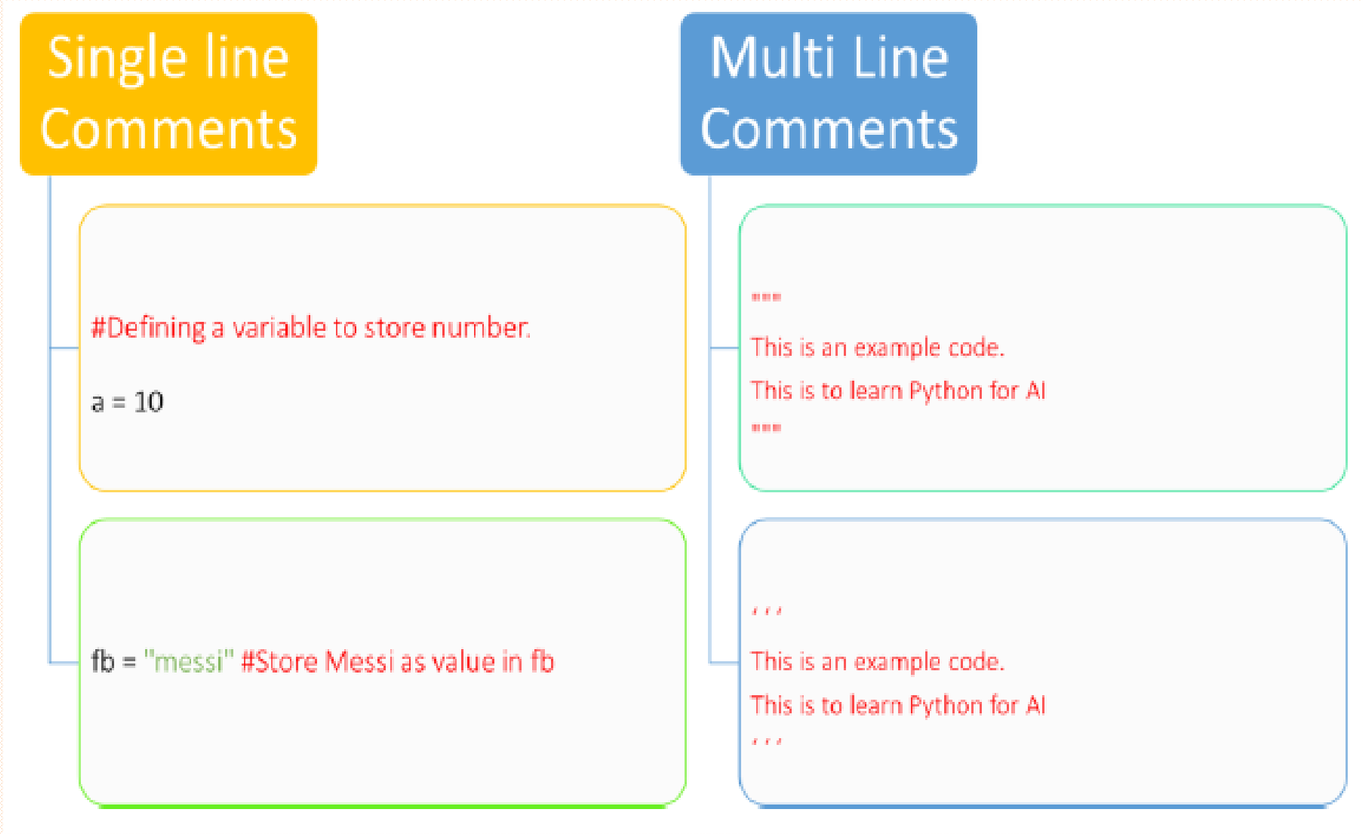
Python Statement

Instructions written in the source code for execution are called statements. There are different types of statements in the Python programming language like Assignment statement, Conditional statement, Looping statements etc. These help the user to get the required output. For example, n = 50 is an assignment statement.

Python Comments

A **comment** is text that doesn't affect the outcome of a code, it is just a piece of text to let someone know what you have done in a program or what is being done in a block of code.

In Python, we use the hash (#) symbol to start writing a comment.



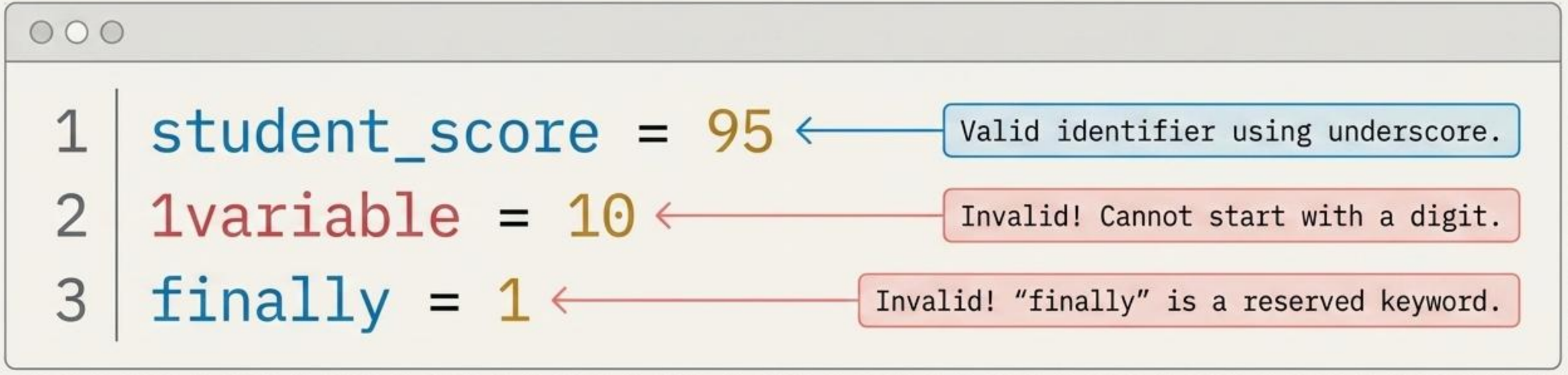
The Grammar of Code: Keywords & Identifiers

Keywords

Reserved words Python uses to recognize program structure. (e.g., True, if, while). You cannot use these as variable names!

Identifiers

Custom names given by the coder to variables, functions, or classes. (e.g., count = 10). Python is case-sensitive!



RULES FOR IDENTIFIERS

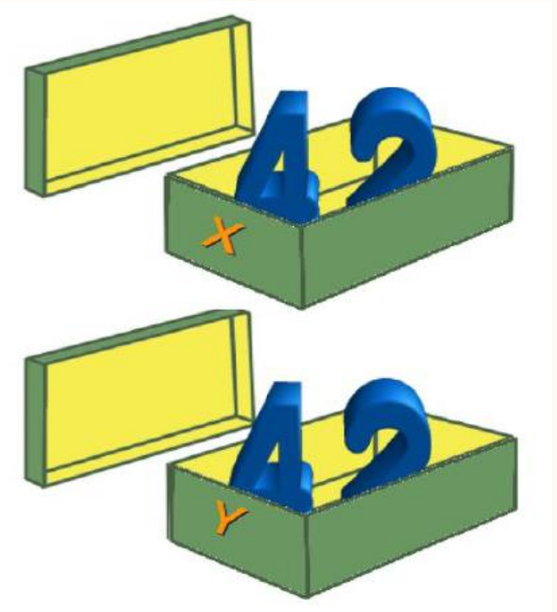
- Use **letters (a–z, A–Z), digits (0–9), and underscore (_)**
- Cannot start with a digit
- ✔️ value1
- ❌ 1value
- No spaces or special characters (@, %, $, #, etc.)
- Cannot use **reserved keywords** eg: class, def, if, else, for, etc.
- Identifiers are case-sensitive eg: name, Name, and NAME are different
- Identifier can be of any length

Variables

A variable is a named location used to store data in the memory. It is helpful to think of variables as a container that holds data which can be changed later throughout programming. For example,

x = 42

y=42



Constants:

A constant is a type of variable whose value cannot be changed. It is helpful to think of constants as containers that hold information which cannot be changed later.

Non technically, you can think of constant as a shoe box with a fixed size of shoe kept inside which cannot be changed after that.

Materials of the Trade: Data Types & Operators

Data Types

1
Numbers
`Integers (10), Floats (10.5)`

2
Sequences
`Strings ("Hello"), Lists ([1, 2, 3]), Tuples ((1, 2, 3))`

3
Sets
`Unordered unique values ({1, 2, 3})`

4
Mapping
`Dictionaries ({'key': 'value'})`

Operators

Arithmetic
`+, -, *, /, % (Remainder), ** (Power)`

Comparison
`==, >, <, != (Returns True/False)`

Logical
`and, or, not`

Assignment
`=, +=, -=`

Shape-Shifting Data: Type Conversion

Implicit Conversion

Python automatically upgrades data to avoid data loss. No human intervention needed.

```
print(10 + 20.5)  -> 30.5
```

int + float automatically becomes a float.

Explicit Typecasting

The programmer forces a data type change using built-in functions like `str()`, `int()`, or `float()`.

```
a = 20
b = " Apples"
print(str(a) + b)  -> 20 Apples
```

We explicitly cast the integer 20 into a string to combine it with text.

Python Input Output

Python Output: We use the print() function to output data to the standard output device (screen). We can also output data to a file.

Example Code	Sample Output

`a = 20`
`b = 10`
`print(a + b)`
	`30`

`print(15 + 35)`	`50`
`print("My name is Kabir")`	`My name is Kabir`
`a = "tarun"` `print("My name is :",a)`	`My name is : tarun`
`x = 1.3` `print("x = /n", x)`	`x =` `1.3`
`m = 6` `print(" I have %d apples",m)`	`I have 6 apples`

Python Input Output

Python input: In python, input() function is used for the same purpose.

Syntax	Meaning
`<String Variable>=input(<String>)`	For string input
`<integer Variable>=int(input(<String>))`	For integer input
`<float Variable>=float(input(<String>))`	For float (Real no.) input