



Python Variables and Constants

Quick Notes for Beginners

 Quick-reference notes • Keep this beside your Python practice

1. Variables – Quick Idea

A variable is a name used to refer to a value. Python does not require a separate variable declaration.

```
age = 20
name = "Rahul"
```

- The value associated with a variable can change.
- Python determines the data type from the value assigned.

2. How Python Variables Work

```
x = 10
x = 25
print(x)
```

The second assignment changes the value associated with x. Output: 25

3. Variables Can Change Type

```
x = 10
print(x)

x = "Hello"
print(x)
```

Python allows the same variable name to refer to values of different types at different times. This is dynamic typing.

4. Common Data Types

Type	Example	Used for
int	20	Whole numbers
float	87.5	Decimal numbers
str	"Rahul"	Text
bool	True	True / False

Check a type with: `type(variable)`

5. Rules for Naming Variables

1. Start with a letter (A–Z or a–z) or underscore (_).
2. Do not start with a number.
3. After the first character, letters, digits and underscores are allowed.
4. Do not use spaces or symbols such as -, @, # and \$.
5. Variable names are case-sensitive.
6. Python keywords such as if, for, class, while and def cannot be used.

Good practice: use meaningful names such as student_name and total_marks.

6. Case Sensitivity

```
age = 20
Age = 30
AGE = 40

print(age)
print(Age)
print(AGE)
```

age, Age and AGE are three different variable names in Python.

7. Multiple Assignment

Same value: x = y = z = 10

Different values: name, age, marks = "Ravi", 20, 85

When assigning different values, the number of variables and values should match.

8. Swapping Variables

```
a = 10
b = 20
a, b = b, a
```

Python can swap values without explicitly creating a temporary variable. A temporary variable is a common approach in C/C++/Java.

9. Constants in Python

A constant is a value intended to remain unchanged.

```
PI = 3.14159
MAX_MARKS = 100
```

- Python has no built-in const keyword for ordinary constants.

- Uppercase names communicate programmer intention.
- Python does not prevent reassignment of an uppercase name.

10. Python vs C/C++/Java – Constants

Language	Common approach	Example
Python	Naming convention	PI = 3.14159
C	const qualifier	const float PI = 3.14159;
C++	const qualifier	const double PI = 3.14159;
Java	final keyword	final double PI = 3.14159;

Important: #define in C is a preprocessor macro, not the same thing as a typed const object.

11. Mini Practice Program

```
PI = 3.14159
radius = float(input("Enter radius: "))
area = PI * radius * radius
print("Area =", area)
```

PI → intended constant | radius and area → variables

Formula: $\text{Area} = \pi \times \text{radius} \times \text{radius}$

12. Quick Self-Check

- Q1. What is a variable in Python?
- Q2. Is variable declaration required before assignment?
- Q3. Why is 2name invalid?
- Q4. Are age and Age the same variable?
- Q5. Does Python have a built-in const keyword?
- Q6. How are constants normally represented in Python?
- Q7. What is the difference between x and X?
- Q8. What is final used for in Java?
- Q9. How do you swap a and b in Python?

