Variables, types & operators

Python Reference

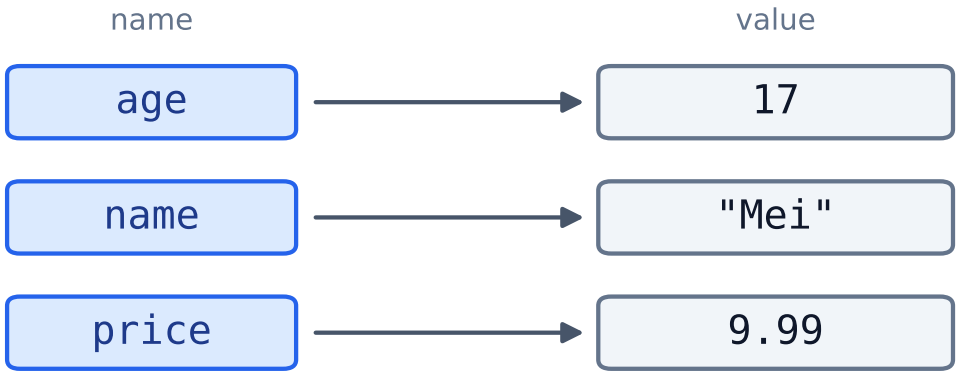
Variables & assignment

A variable 变量 is a name for a value 值. You make one with `=`, which is called assignment 赋值. The name goes on the left; the value goes on the right.

```
age = 17
name = "Mei"
price = 9.99
print(age, name, price)
```

Now `age` holds `17`. Use the name anywhere you need the value, and change it later:

```
age = 17
age = age + 1   # age is now 18
print(age)
```



Each variable name points to a value in memory

- The `=` sign does not mean "equal". It means "store the right side under the left name".
- To test if two values are equal, use `==` (see below).

Numbers: int & float

Python has two main number types. An integer 整数 (`int`) is a whole number like `17`. A float 浮点数 (`float`) has a decimal point like `9.99`.

These operators 运算符 work on numbers:

Operator	Meaning	Example	Result
`+`	add	`3 + 2`	`5`
`-`	subtract	`3 - 2`	`1`
`*`	multiply	`3 * 2`	`6`
`/`	divide (always float)	`7 / 2`	`3.5`
`//`	integer divide	`7 // 2`	`3`
`%`	remainder (modulo)	`7 % 2`	`1`
`**`	power	`2 ** 3`	`8`

- `/` always gives a float, so `4 / 2` is `2.0`.
- `//` and `%` go together: `17 // 5` is `3`, and `17 % 5` is `2`.

Expressions & type conversion

An expression 表达式 is anything that has a value, like `3 + 4 * 2`. Python uses normal maths order (`*` and `/` before `+` and `-`); add brackets to make the order clear.

`input()` gives a string, so convert it before doing maths. Changing a value from one type to another is type conversion 类型转换:

```
age = int("17")        # text "17" -> number 17
price = float("9.99")  # text -> 9.99
label = str(17)        # number -> text "17"
print(age, price, label)
```

- `int("abc")` fails, so only convert text that looks like a number.
- Mixing types fails too: `"age: " + 17` is an error; write `"age: " + str(17)`.

Booleans & comparison

A Boolean 布尔值 is one of just two values: `True` or `False`. A comparison 比较 gives back a Boolean.

Operator	Meaning
`==`	equal to
`!=`	not equal to
`< >`	less than / greater than
`<= >=`	less / greater than or equal to

```
print(7 > 2)        # True
print(3 == 3.0)     # True
age = 20
print(age >= 18)    # True
```

Join comparisons with `and`, `or`, `not`:

```
age = 20
print(age >= 13 and age <= 19)   # True only for a teenager
```