

# Python Basic 01

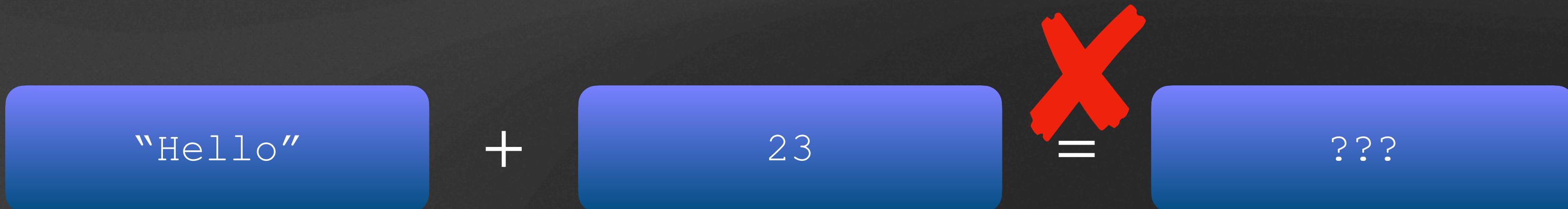
Types, Variable, and Operators

Carlos 2023 Fall

# 資料型別 Data Types

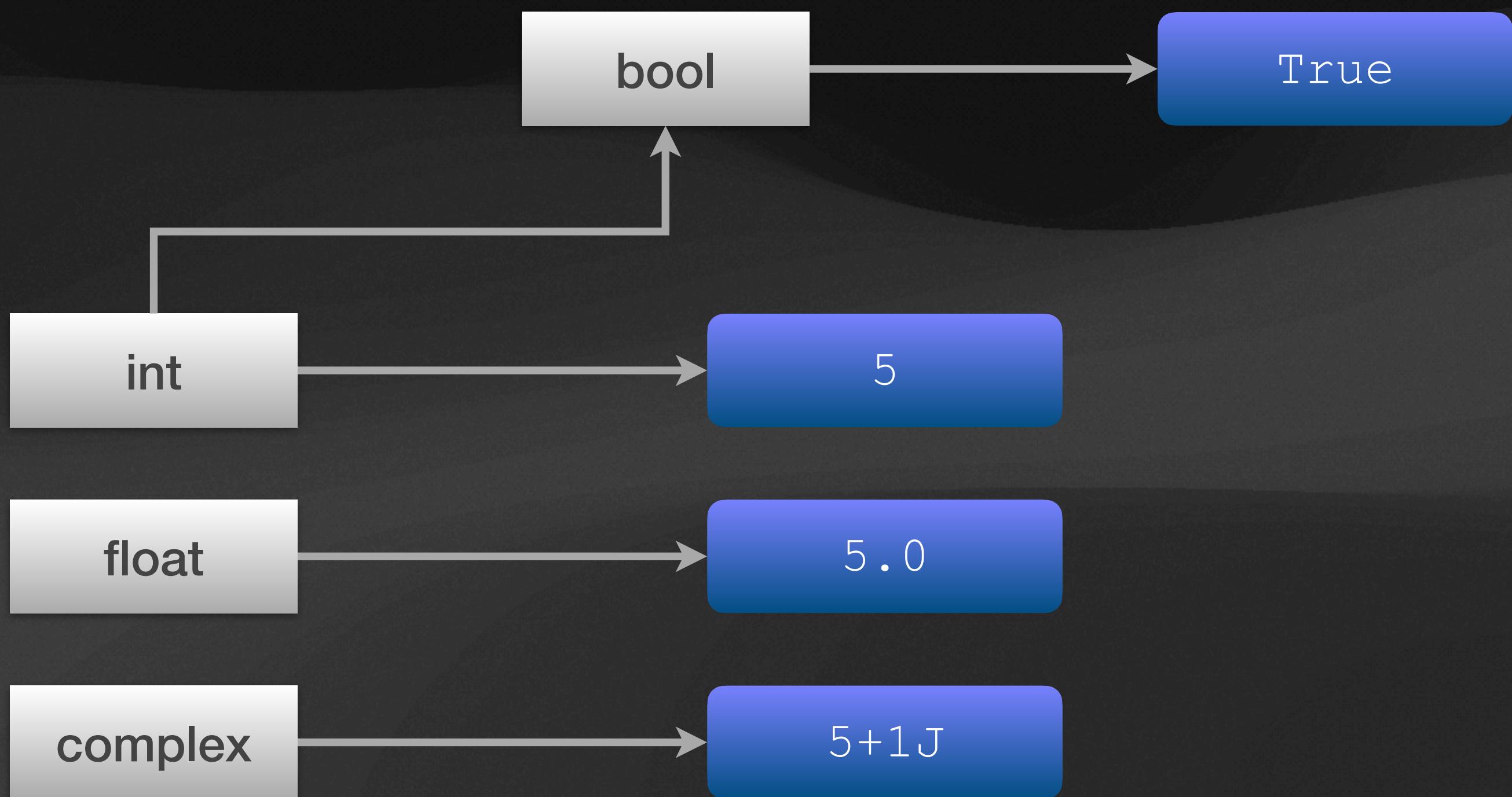
# Data Types in Python

- 動態型別 (Dynamically Typed)
- 強型別 (Strongly Typed)



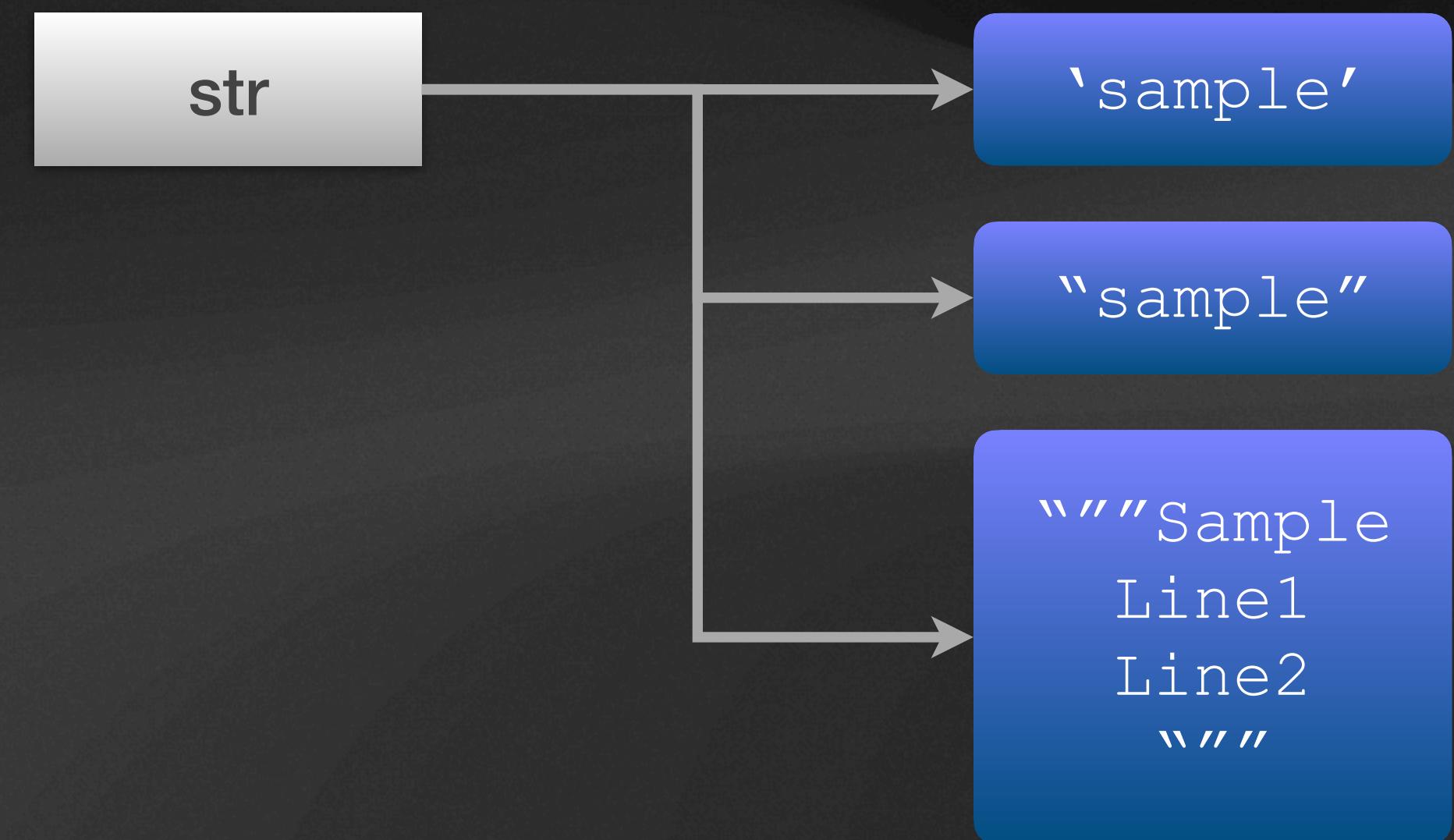
# Data Types in Python

## Numeric type



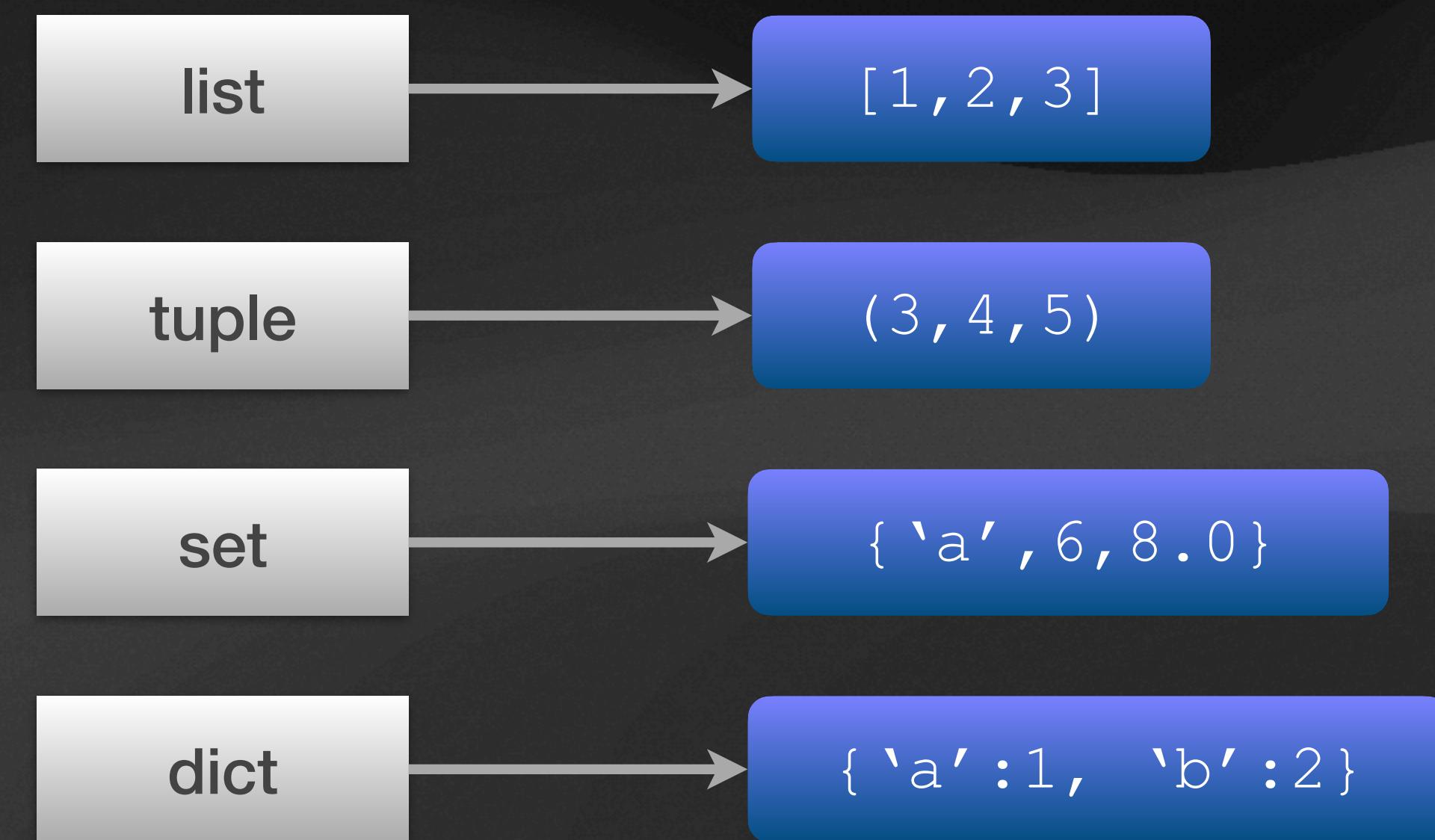
# Data Types in Python

## Text sequence type



# Data Types in Python

## Sequence type



# Data Types in Python

## Sequence type

Container	list	tuple	set	dict
符號 Notation	[ ]	( )	{ }	{ }
有無序 Ordered	Yes	Yes	No	No
可更動 Mutable	Yes	No	Yes	Yes

# 變數 Variable

# Name Rules

- 首字母不可以為：
  1. 數字
  2. 特殊符號，如：! % \* - + ...
- 不能使用關鍵字：do, if, else ...
- 使用有意義的英文命名

# Name Rules

- 指派”數值”給”變數”使用
- 根據數值的資料型態自動賦予變數型別



```
ex_int = 5
```

# 運算子 Operator

# Operator

- 數學運算子
  - 加減法：+、-
  - 乘除法：\*、/
  - 模數：%
  - 指數：\*\*

# Operator

- 邏輯運算子
  - 且 (And) : and
  - 或 (Or) : or
  - 否 (Not) : not

# Operator Example

```
1 # variable declaration
2 a = 11
3 b = 5
4 # addition
5 c = a + b
6 # multiplication
7 d = a * b
8 # modulus
9 e = a % b
10 # output the result
11 print(a)
12 print(b)
13 print(c)
14 print(d)
15 print(e)
```

ex\_operation.py

```
● (.venv) kaiyang@Kais-MacBook-Pro Class_Example % python3 ex_operation.py
11
5
16
55
1
```

ex\_operation.py output

# 基本輸入與輸出 Basic I/O

# Output

- \*values: 輸出的值
- sep: 分隔字元
- end: 最後要加上的字串

```
def print(  
    *values: object,  
    sep: str | None = " ",  
    end: str | None = "\n",  
    file: SupportsWrite[str] | None = None,  
    flush: Literal[False] = False  
) -> None: ...
```

X

# Output Example

```
1 # print integer
2 print(5)
3 # print variable
4 a = 12
5 print(a)
6 # print string
7 print('hello, python!')
8 # print string and variable
9 print('a = ', a)
10 # print multiple strings
11 print('hello', ' ', this', ' is an', ' example code!')
```

ex\_print.py

```
● (.venv) kaiyang@Kais-MacBook-Pro Class_Example % python3 ex_print.py
5
12
hello, python!
a = 12
hello , this  is an  example code!
```

ex\_print.py output

# Input

- \_\_prompt: 提示字串
- 從 input 接收的數值都是字串

```
def input(  
    __prompt: object = "",  
    /  
) -> str
```

---

Read a string from standard input. The trailing  
newline is stripped.

x

# Input Example

```
1 # input a number and set to variable  
2 a = input('Input a number: ')  
3 # output the variable  
4 print('Your input is: ', a)
```

ex\_input.py

- (.venv) kaiyang@Kais-MacBook-Pro Class\_Example % python3 ex\_input.py  
Input a number: 24  
Your input is: 24

ex\_input.py output

# eval()

```
1 num_str = input('Input a number: ')
2 print(type(num_str))
3 print(num_str)
4
5 num = eval(num_str)
6 print(type(num))
7 print(num)
```

# eval()

## Example

```
1 # input a number
2 a = input('Input number1: ')
3 b = input('Input number2: ')
4 # since the 'input()' function returns string type
5 # we use 'eval()' to transfer string to numerical type
6 a = eval(a)
7 b = eval(b)
8 # calculate addition value
9 c = a + b
10 # output the result
11 print('a = ', a)
12 print('b = ', b)
13 print('a + b = ', c)
```

ex\_eval.py

- (.venv) kaiyang@Kais-MacBook-Pro Class\_Example % python3 ex\_eval.py  
Input number1: 21  
Input number2: 3  
a = 21  
b = 3  
a + b = 24

ex\_eval.py output

# Exercise

## 【計算矩形面積】

- 輸入：長、寬
- 輸出：對應矩形面積

# Exercise

【計算平均值】

- 輸入：三個數值
- 輸出：三個數值的平均值