

Python Basic

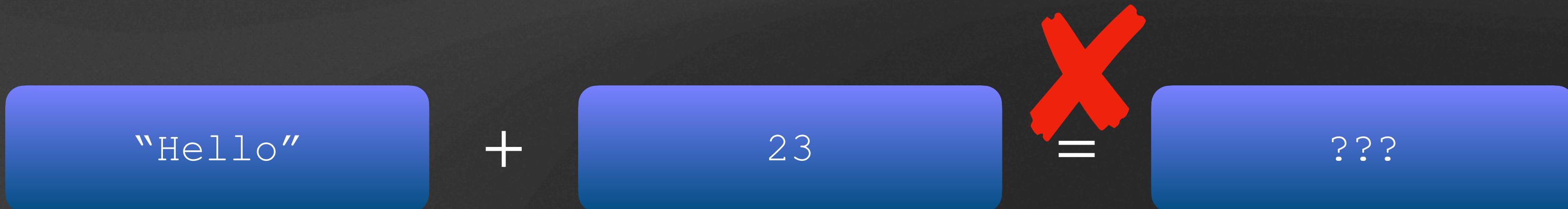
Types, Variable, and Operators

Carlos 2023 Fall

資料型別 Data Types

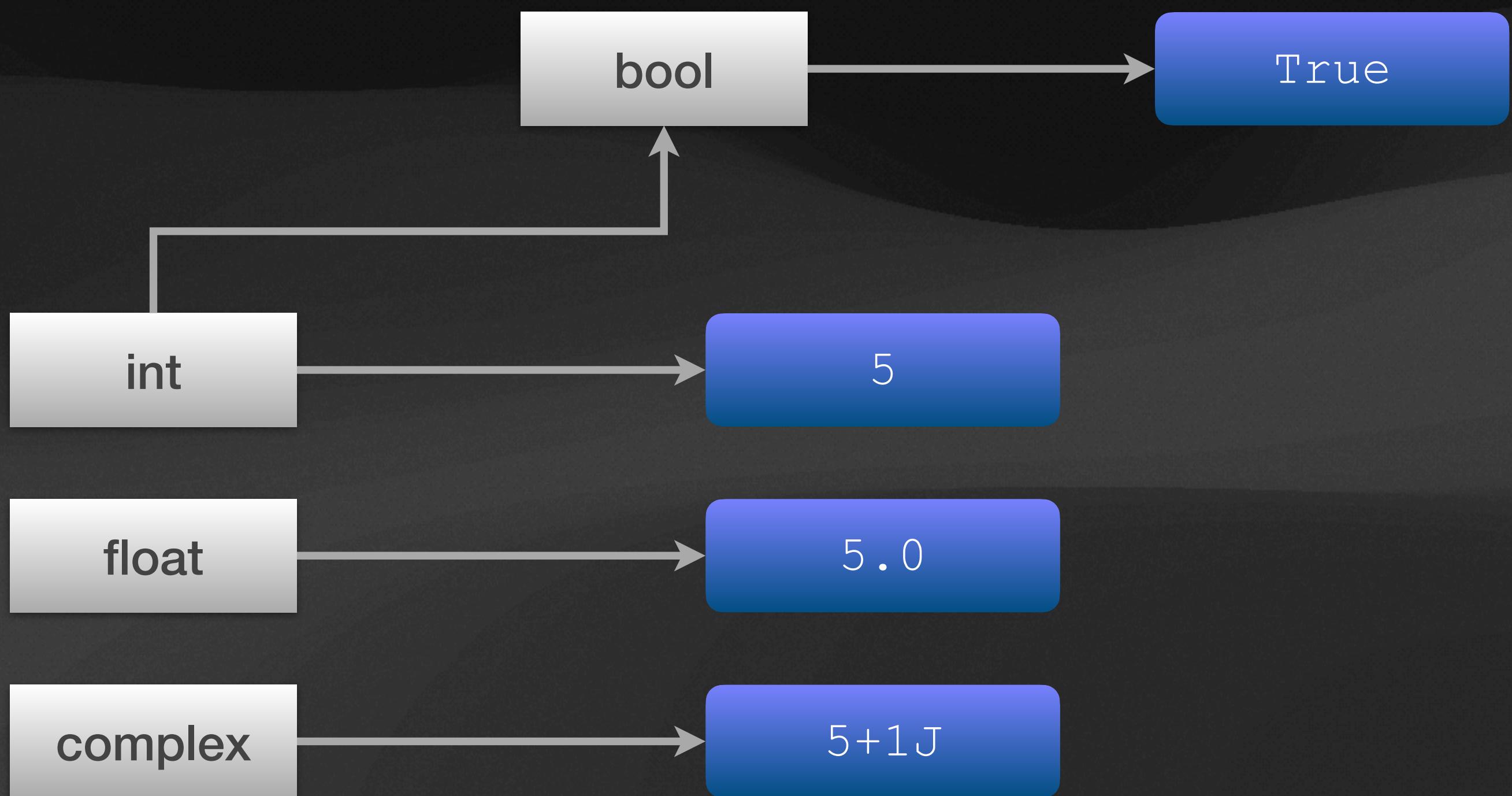
Data Types in Python

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



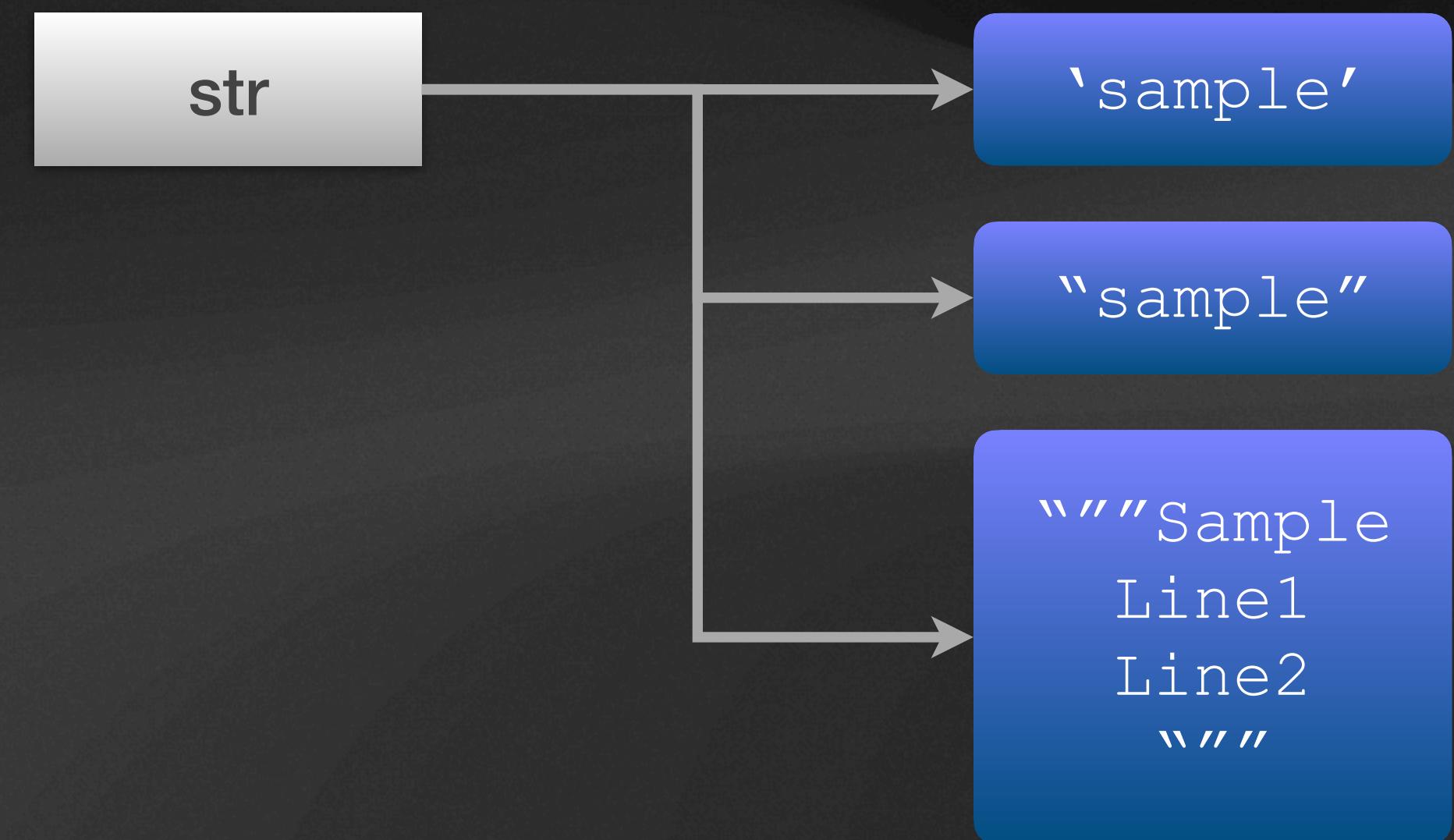
Data Types in Python

Numeric type



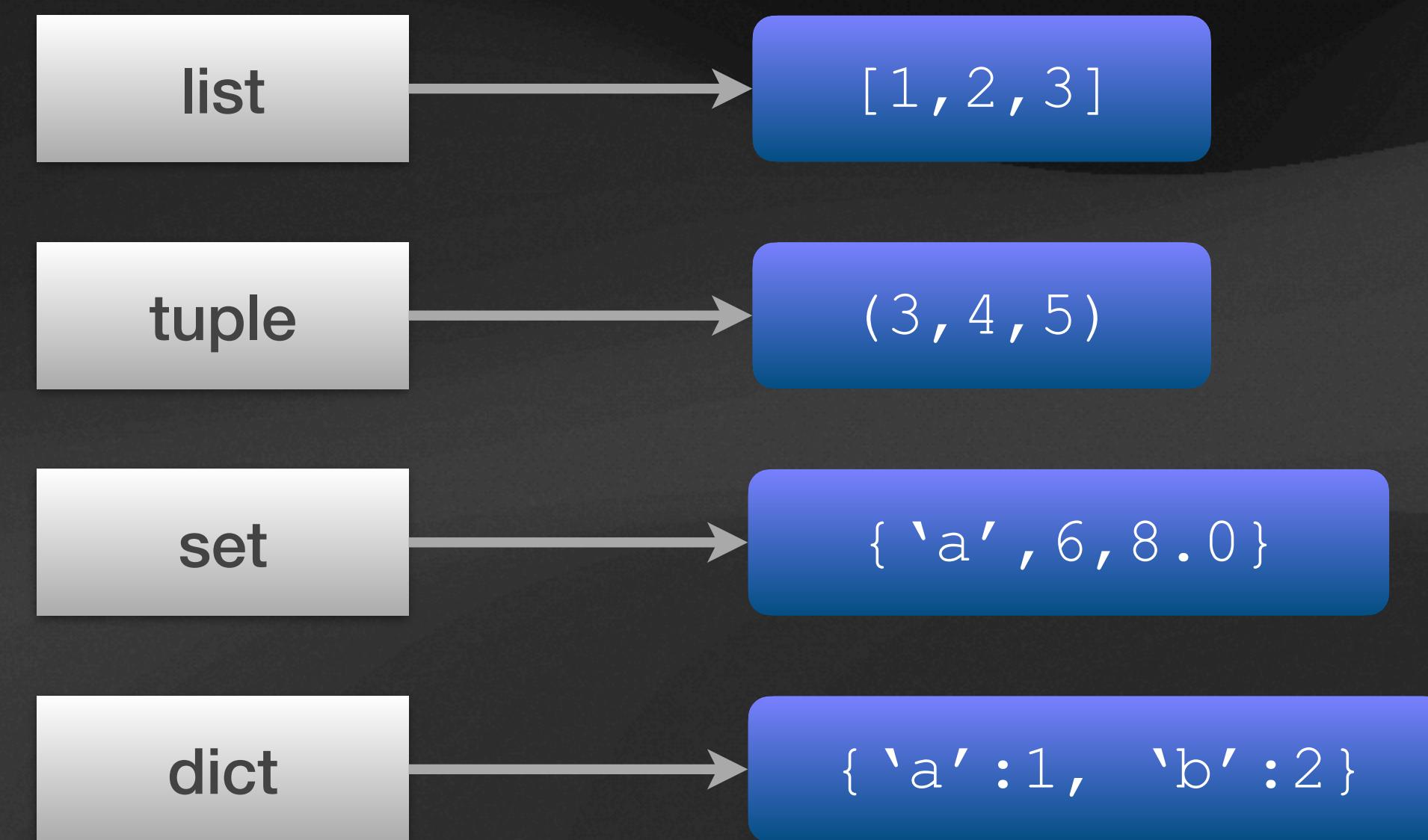
Data Types in Python

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