

Python Basic 01

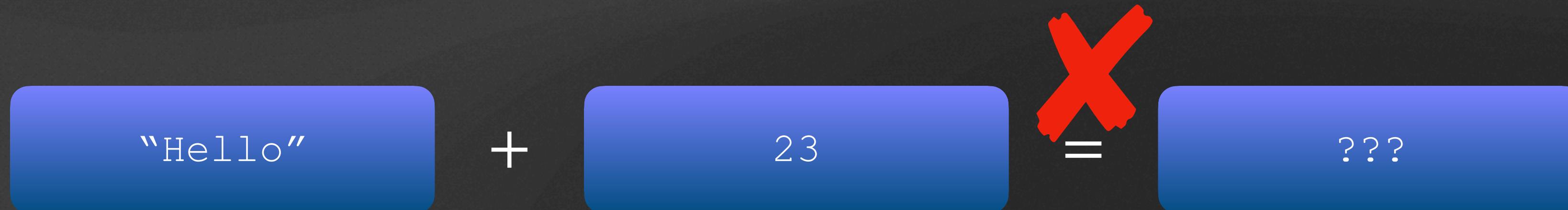
Types, Variable, and Operators

Carlos 2023 Fall

資料型別 Data Types

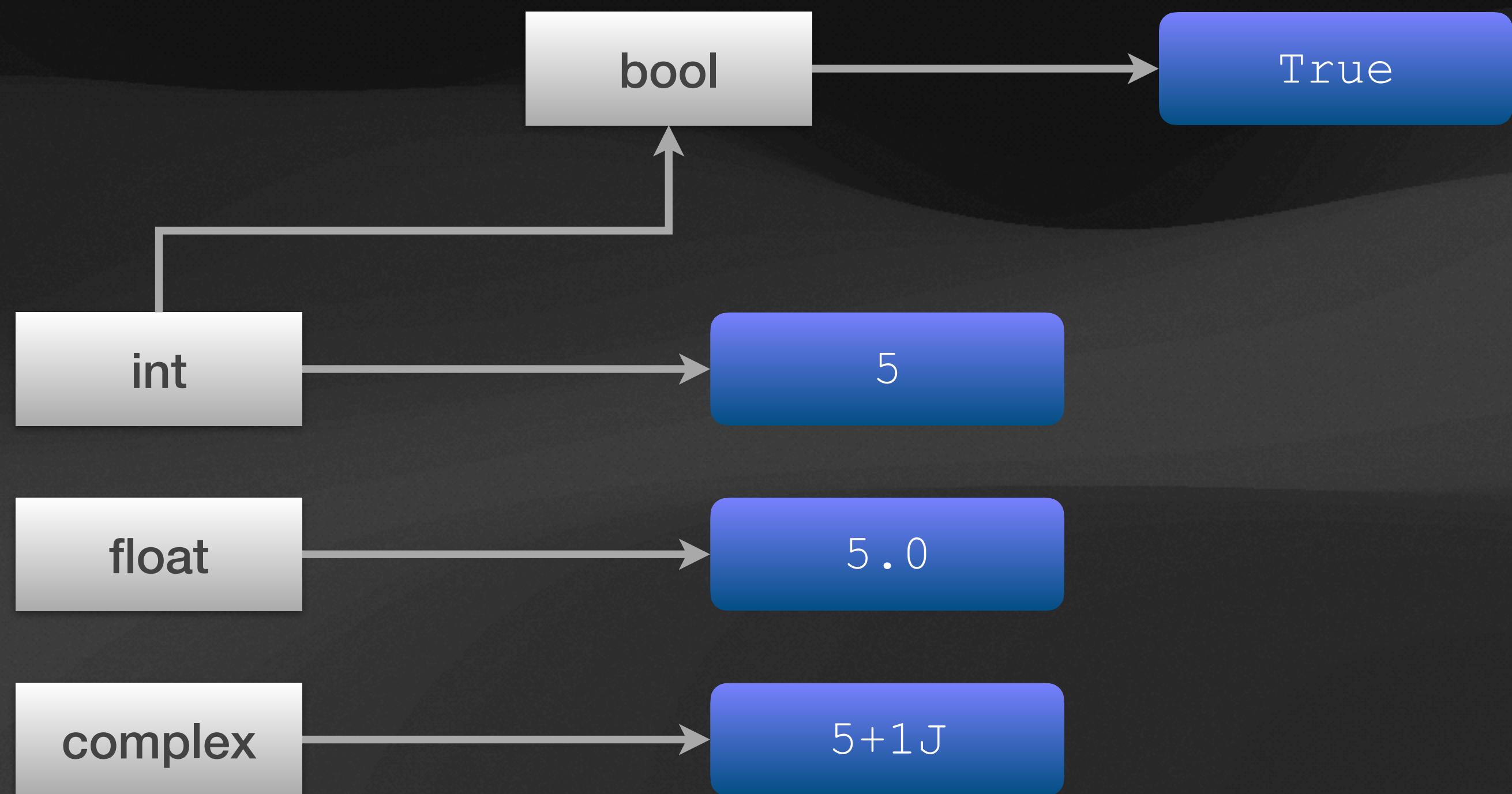
資料型態 Data Types in Python

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



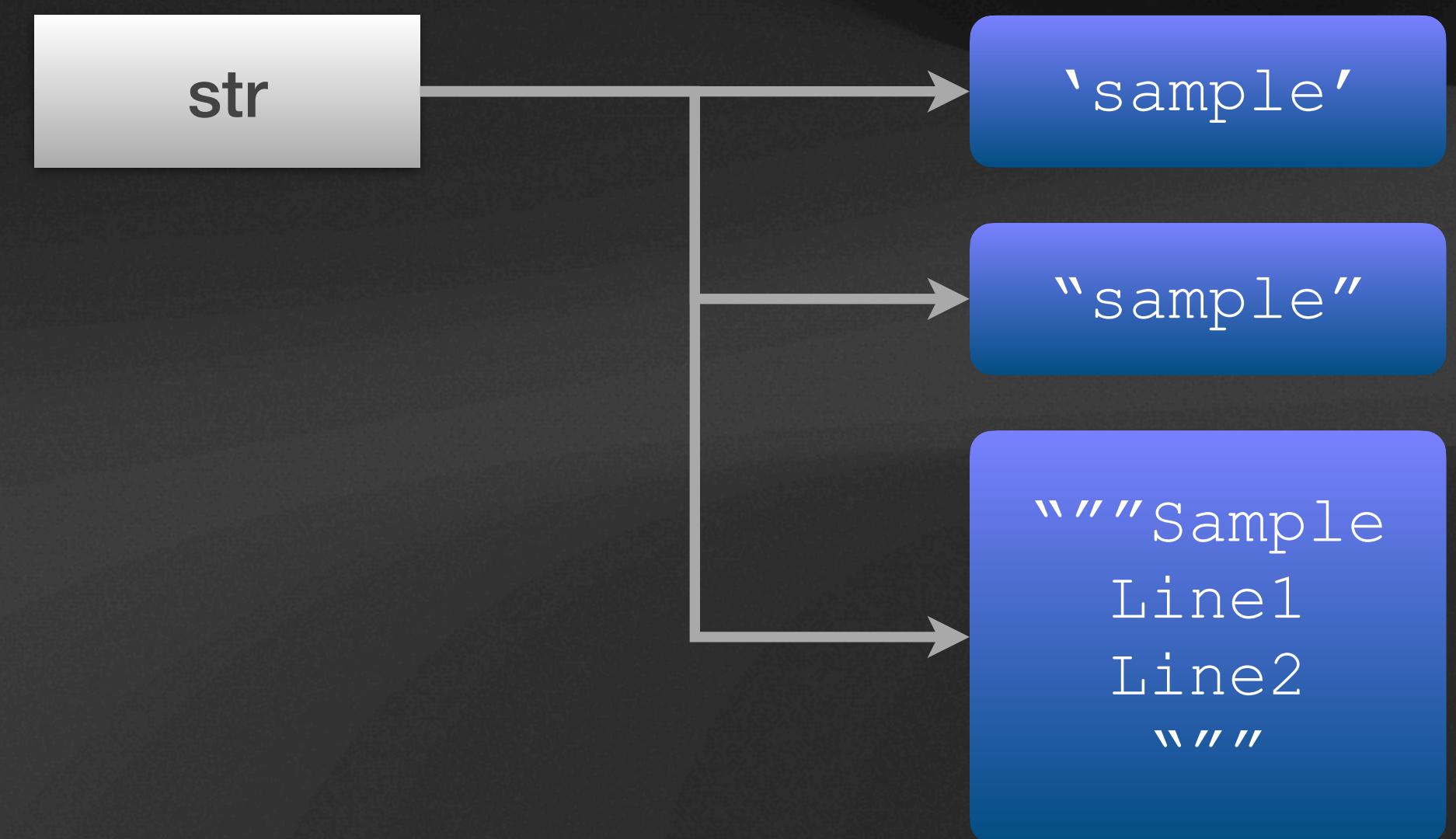
資料型態 Data Types in Python

數字型態 Numeric type



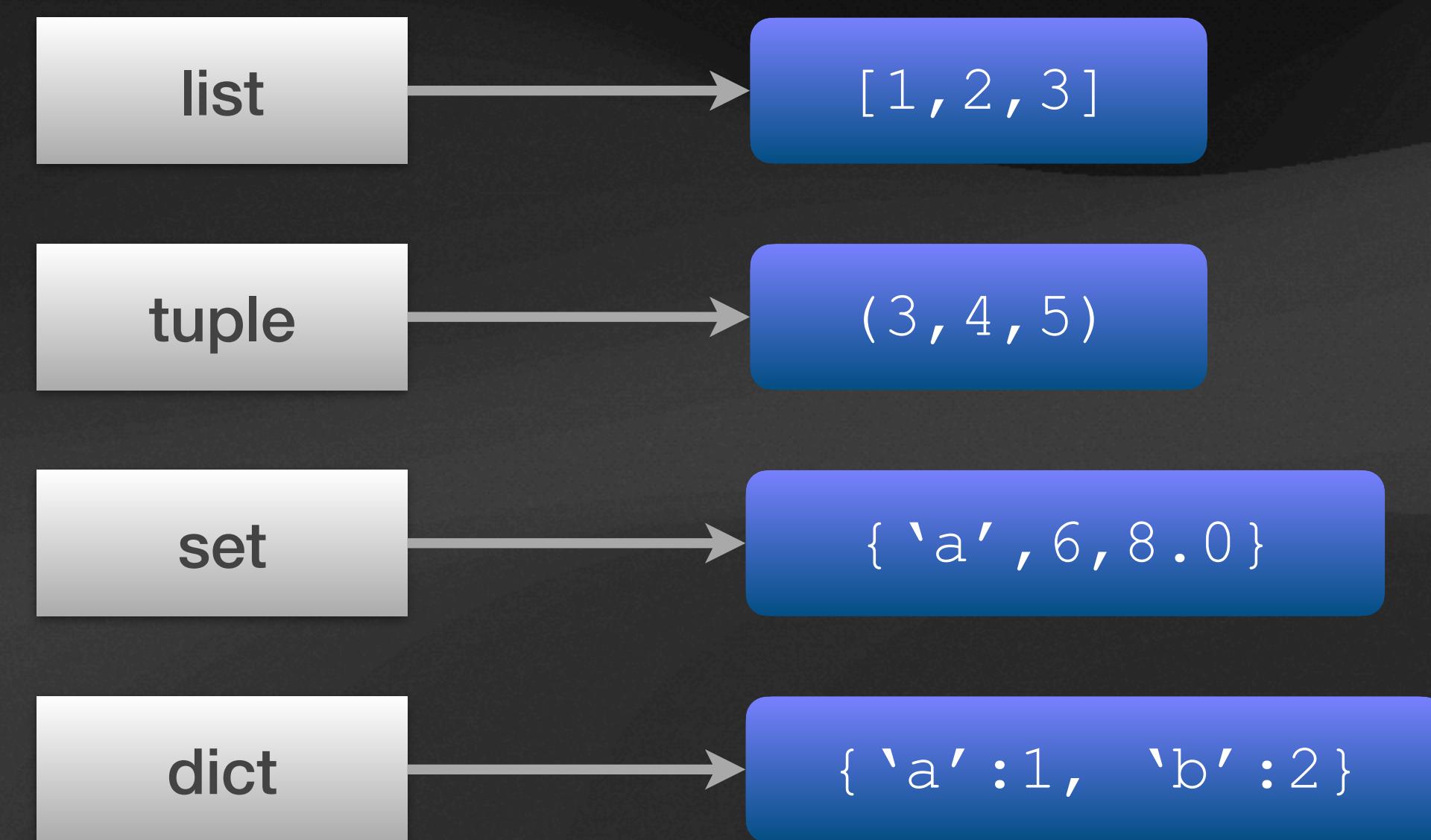
資料型態 Data Types in Python

文字序列 Text sequence type



資料型態 Data Types in Python

序列 Sequence type



資料型態 Data Types in Python

序列 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

命名規則 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

命名規則 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

運算子 Operator

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

運算子 Operator

範例 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)
```

ex011_operation.py

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

ex011_operation.py output

運算子 Operator

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

運算子 Operator

- 關係運算子
 - 等於 : ==
 - 不等於 : !=
 - 大於 : >
 - 小於 : <
 - 大於等於 : >=
 - 小於等於 : <=

基本輸入與輸出 Basic I/O

輸出 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: ...
```

×

輸出 Output

範例 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!')
```

ex012_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!
```

ex012_print.py output

輸入 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.



輸入 Input

範例 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)
```

ex013_input.py

- (.venv) kaiyang@Kais-MacBook-Pro Class_Example % python3 ex_input.py
Input a number: 24
Your input is: 24

ex013_input.py output

字串轉數字 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)
```

ex014_type.py

- (.venv) kaiyang@Kais-MacBook-Pro Unit1:
Input: 24
<class 'str'>
24
<class 'int'>
24

ex014_type.py output

字符串轉數字 eval()

範例 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)
```

ex014_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

ex014_eval.py output

練習 Exercise

【計算矩形面積】

- 輸入：長、寬
- 輸出：對應矩形面積

練習 Exercise

【計算平均值】

- 輸入：三個數值
- 輸出：三個數值的平均值