A Quick Tour of Python

Julien Roland

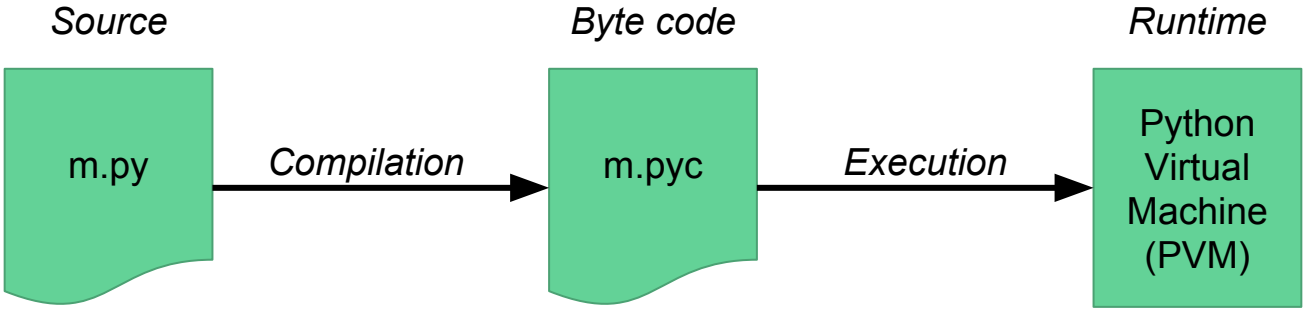
Outline

1. Python
2. Language Syntax
3. Types and Objects
4. Demo : Python REPL, Scripts, Notebooks

Python

Python

- Created by Guido Van Rossum in the late 1980s
- A multi-paradigm programming language (OOP, Procedural,...)
- Interpreted (Byte Compiled)



- Memory management by the interpreter

Language Syntax*

** Based on A Whirlwind Tour of Python by Jake VanderPlas, O'Reilly, 2016*

Language Syntax

```
midpoint = 5

# make two empty lists
lower = []; upper = []

# split the numbers into lower and upper
for i in range(10):
    if (i < midpoint):
        lower.append(i)
    else:
        upper.append(i)

print("lower:", lower)
print("upper:", upper)
```

Comments Are Marked by

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End-of-Line Terminates a Statement

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```

Semicolon Can Optionally Terminate a Statement

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```

Indentation: Whitespace Matters!

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```

Code blocks are denoted by *indentation*

Parentheses Are for Grouping or Calling

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Types and Objects*

** Based on Python Essential Reference, by David Beazley, Addison-Wesley, 2009*

Types and Objects

```
a = 42
```

Types and Objects

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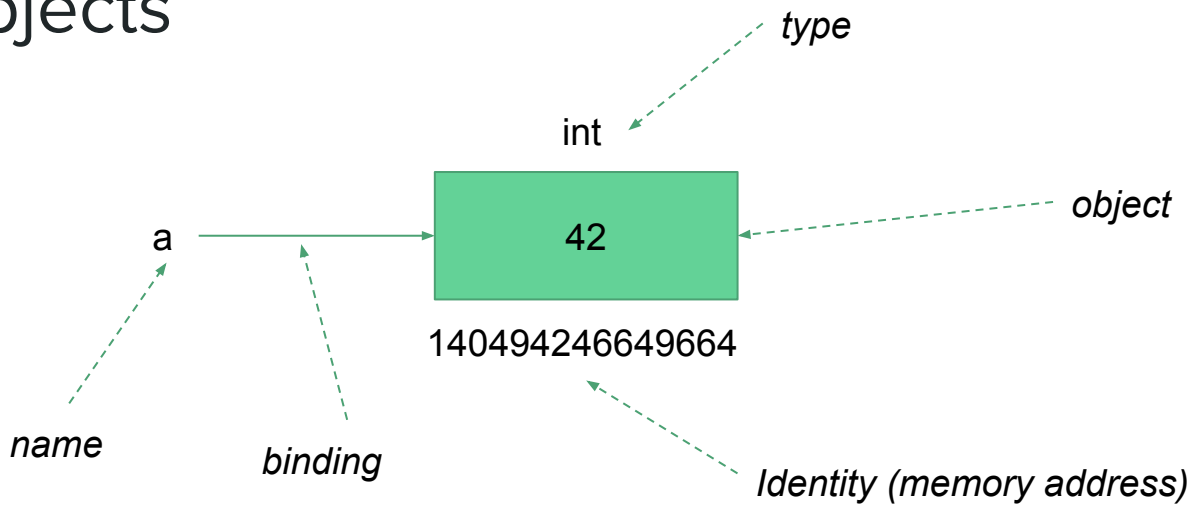
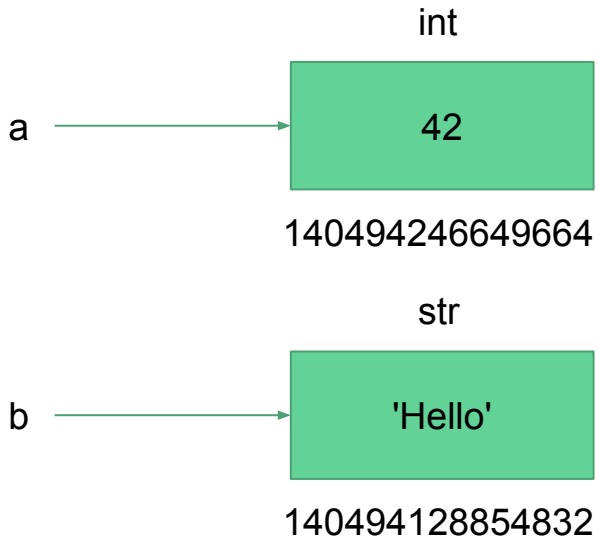


Types and Objects

```
a = 42

b = 'Hello'
```



Types and Objects

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a = 42

b = 'Hello'

b = a
```

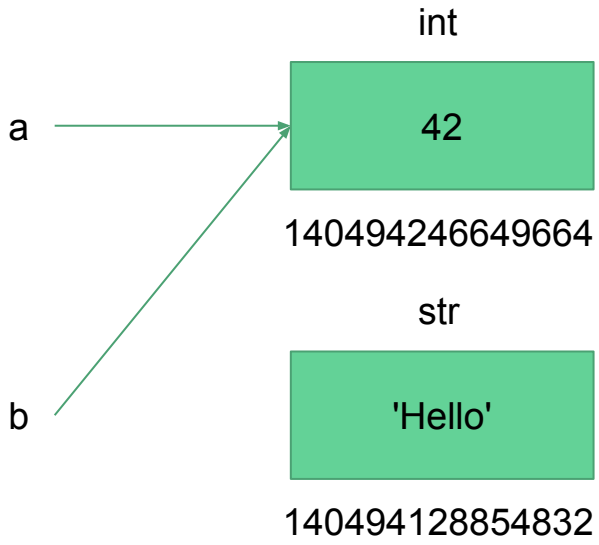

Types and Objects

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b = 'Hello'

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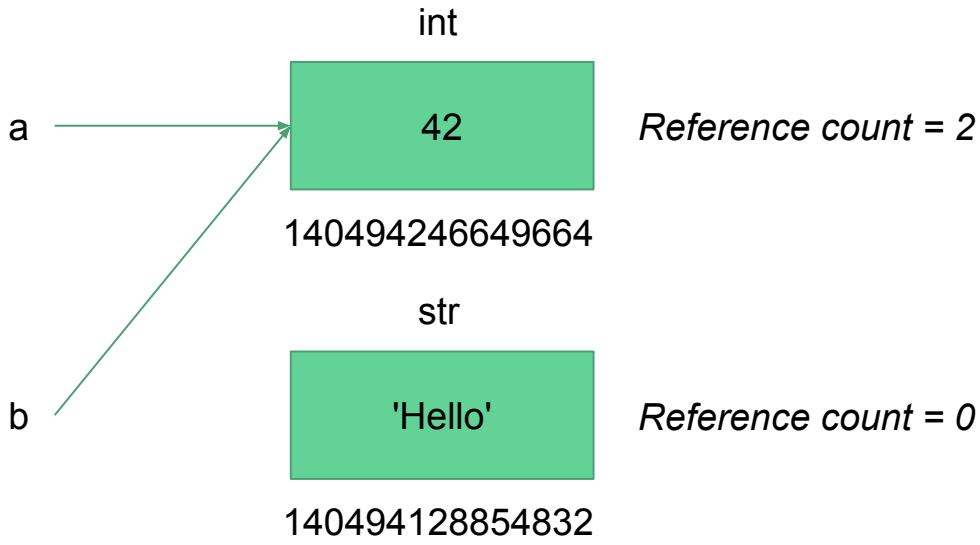

Types and Objects

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b = 'Hello'

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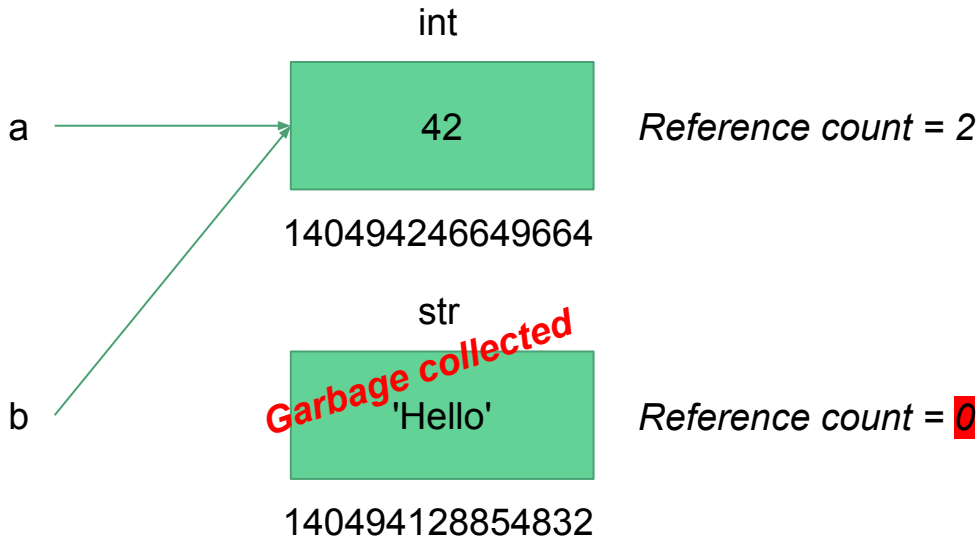


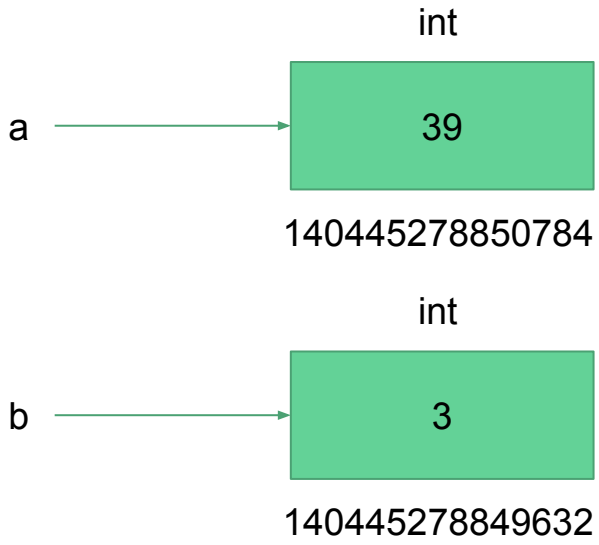
Terminology

- **Type** (the object's class) : describes object's internal representation and methods/operations it supports
- **Instance** : an object of a particular type
- **Mutable** object : its can be modified
- **Immutable** object : its value cannot be modified
- **Container** (or collection) : an object that contains references to other objects

```
filename = 'key.txt'
words = ['contains', 'references', 'to', 'other', 'objects']
```

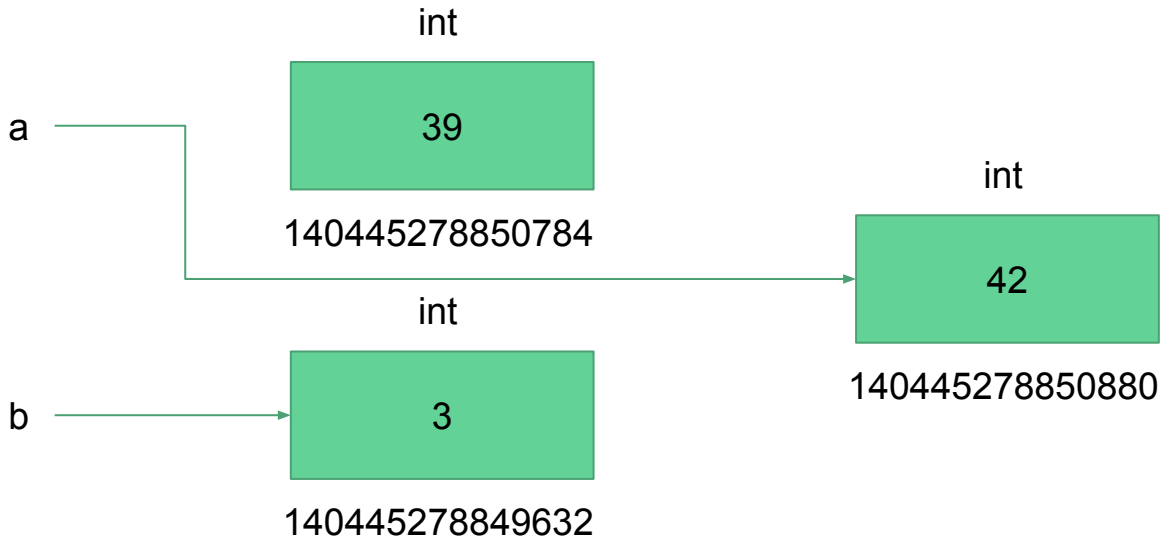
Immutable Objects

```
a = 39

b = 3
```



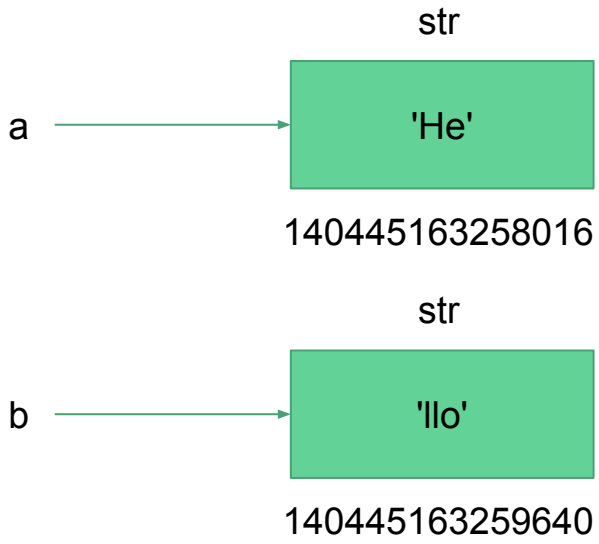
Immutable Objects

```
a = 39

b = 3

a = a + b
```



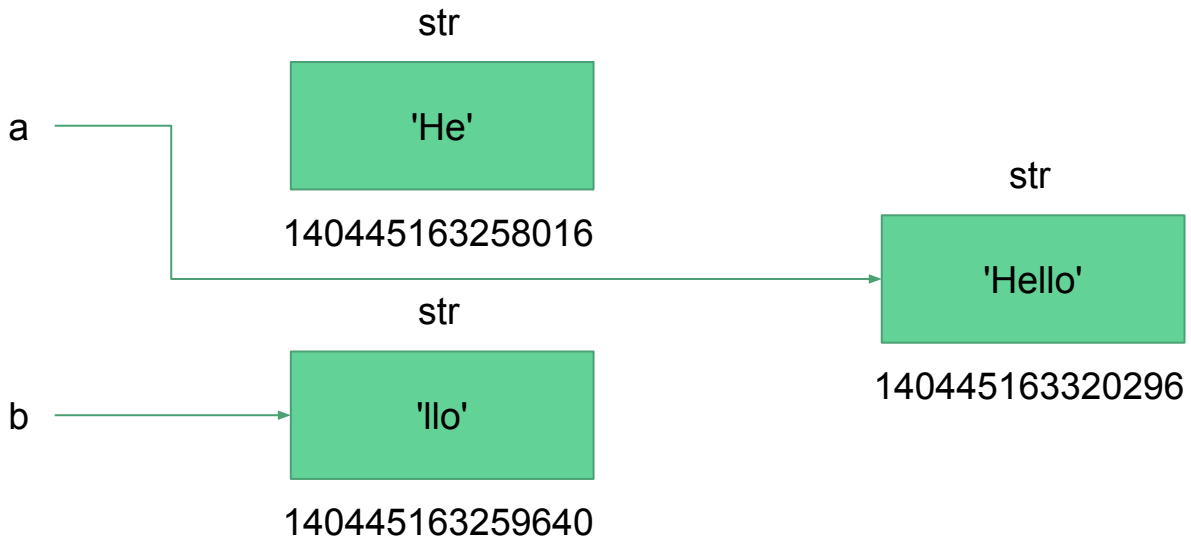
Immutable Objects

```
a = 'He'

b = 'llo'
```



Immutable Objects

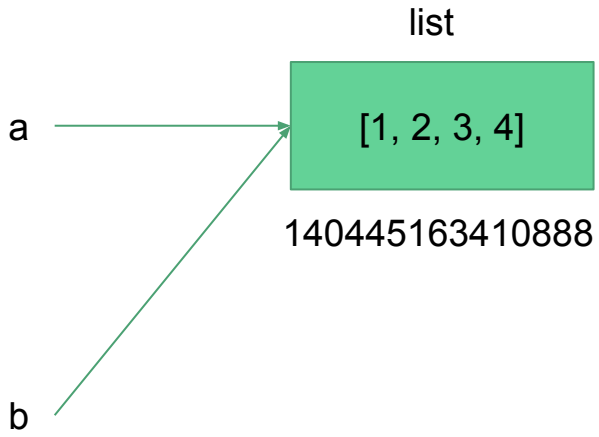
```
a = 'He'

b = 'llo'

a += b
```



Mutable Objects

a = [1, 2, 3, 4]

b = a

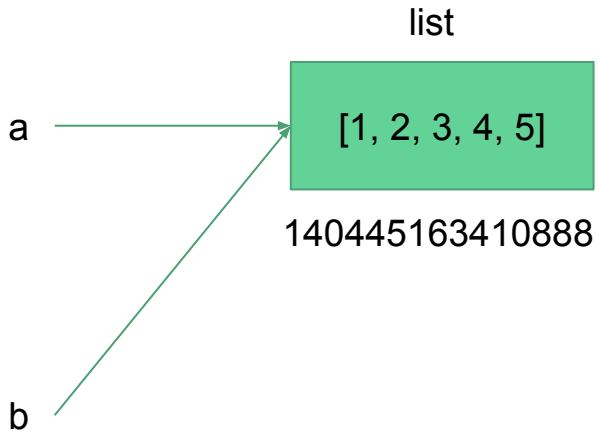


Mutable Objects

a = [1, 2, 3, 4]

b = a

a.append(5)



Demo : REPL, Scripts, Notebooks