Case Study: Python
Introduction

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Introduction

- popular programming language
- created by Guido van Rossum, released in 1991.
- used in many areas: web, software, big data, system scripting,...
- originally implemented in hybrid model
- readability:
  - new line to complete a command
  - indentation to define scope
- static scoping and dynamically typed

Example

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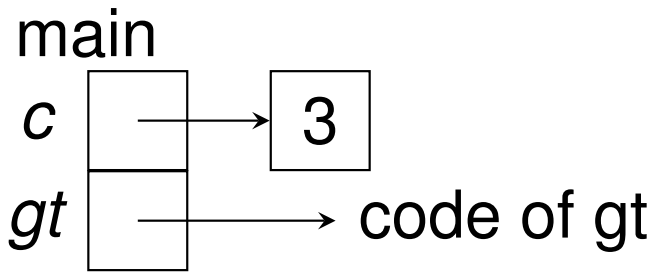

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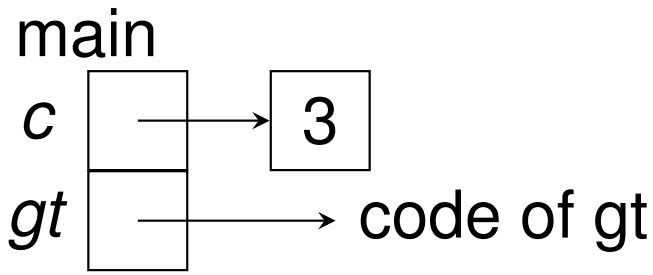

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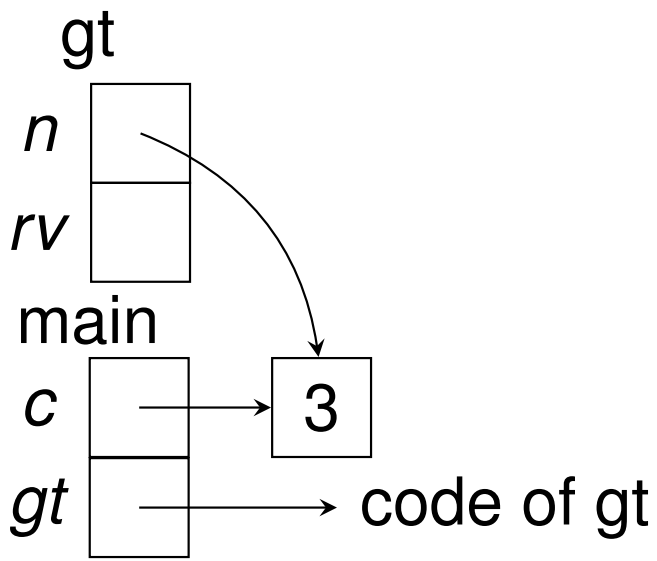

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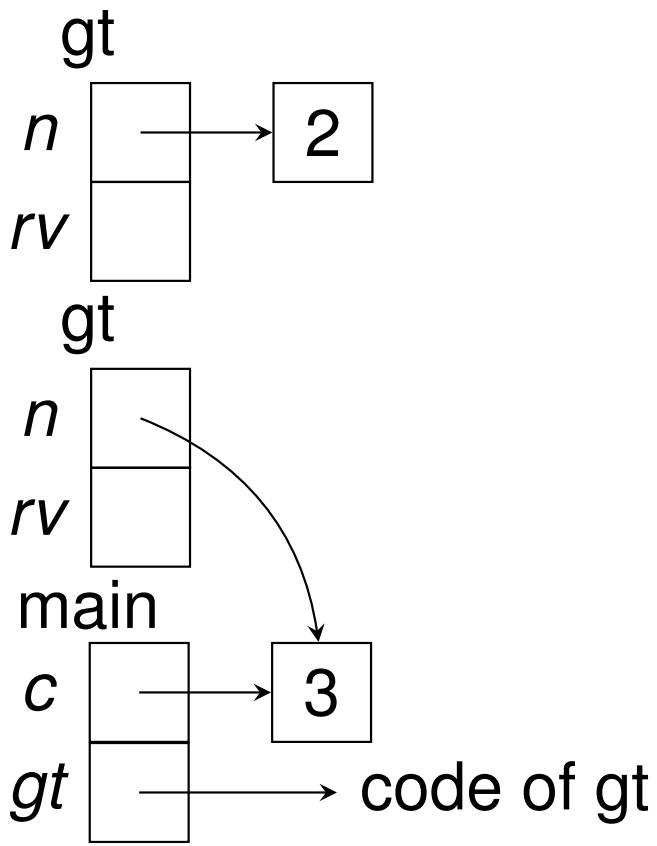

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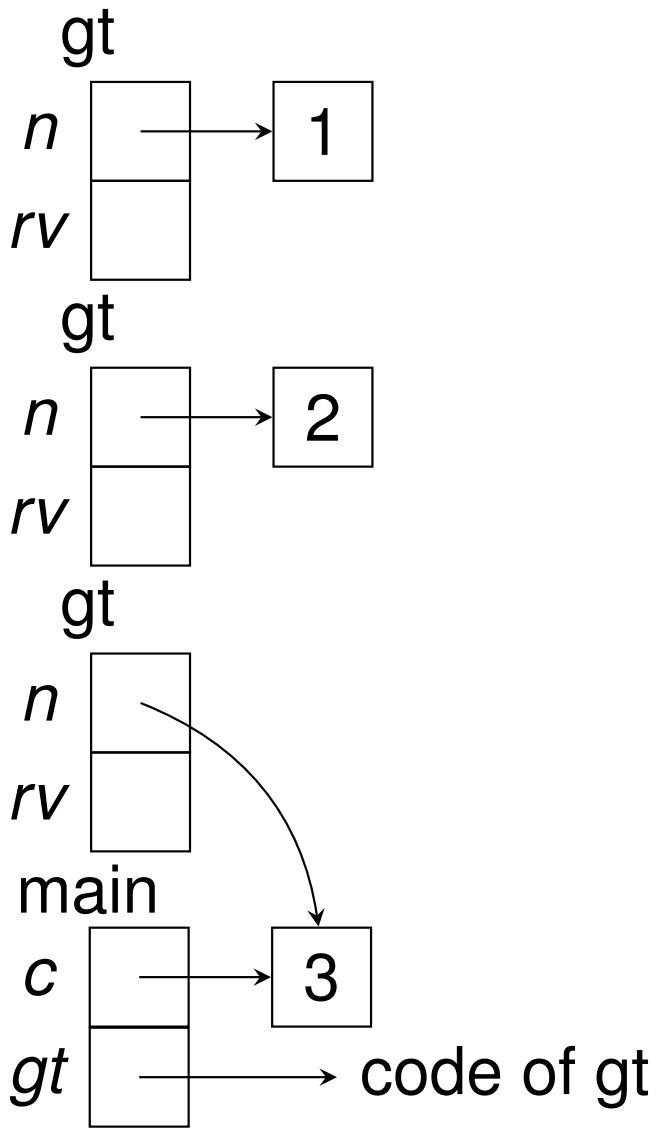

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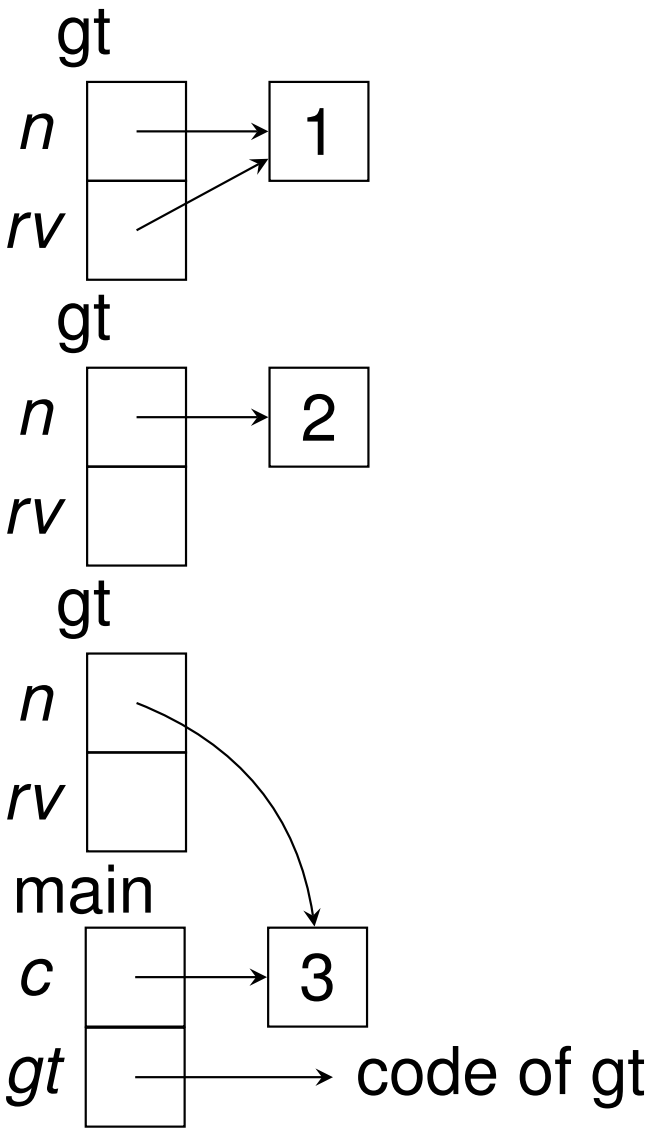

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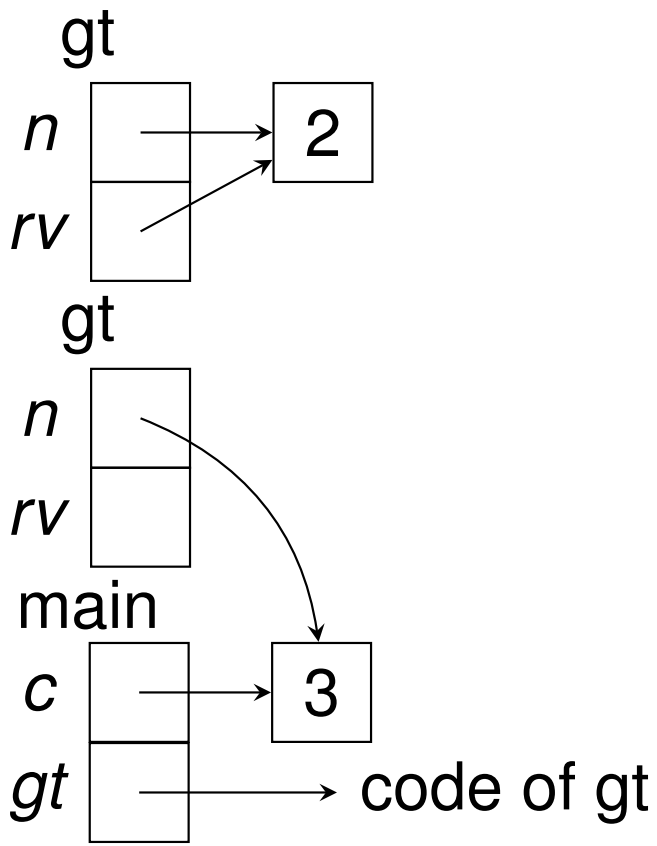

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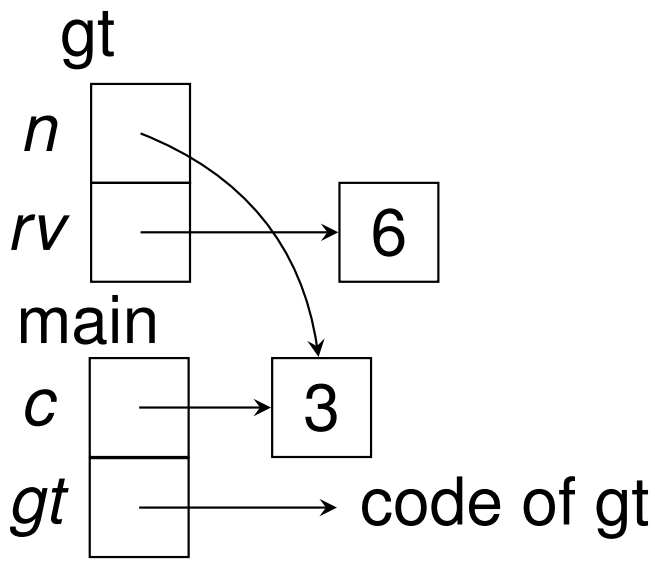

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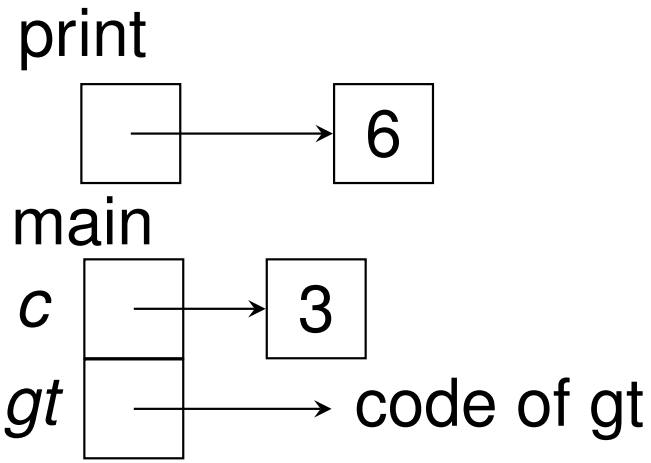

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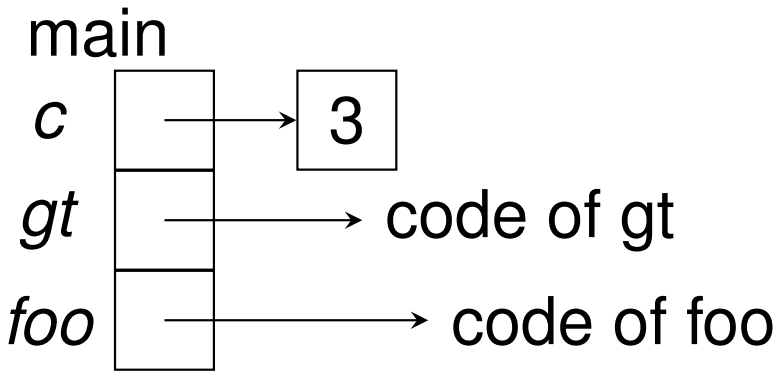

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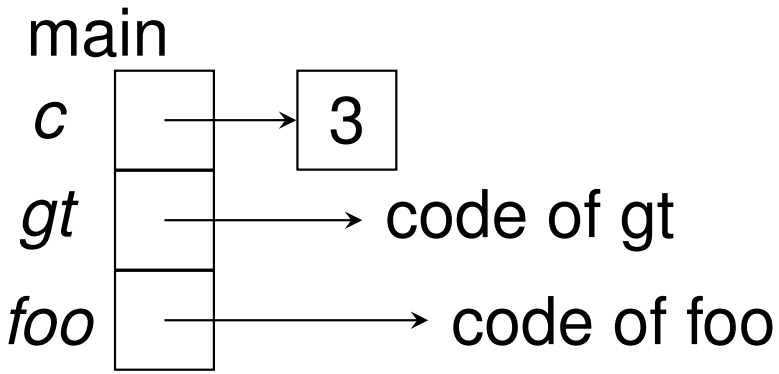

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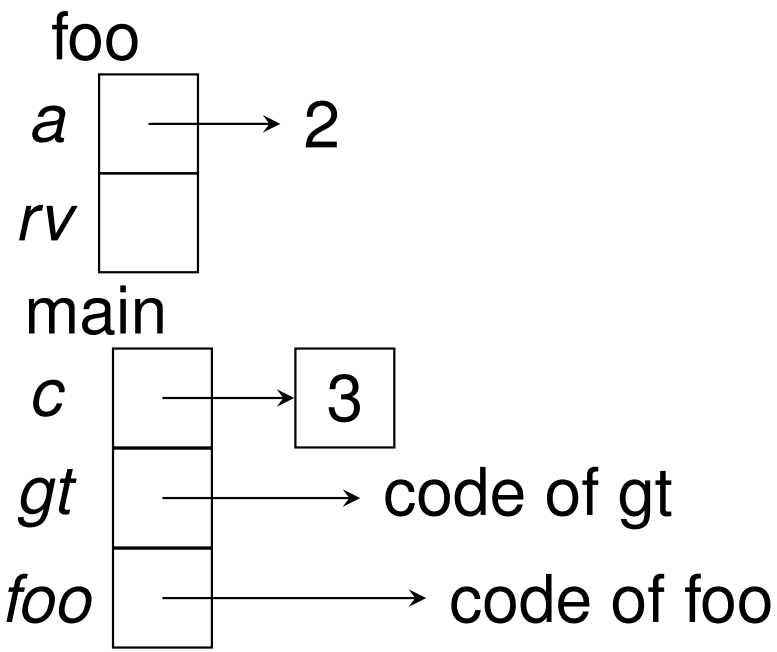

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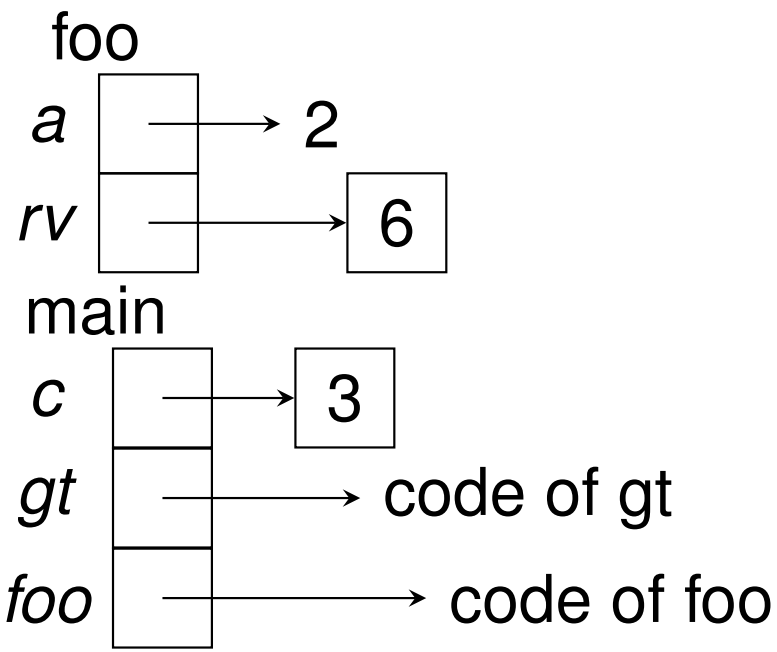

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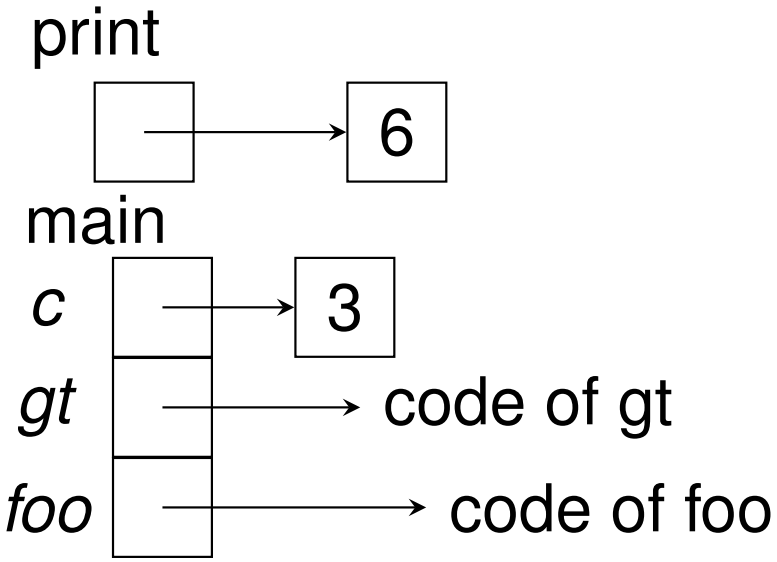

Basic Things

- Variables: Like variables in C++
  - $[a-zA-Z\_][a-zA-Z0-9\_]*$
  - case-sensitive
  - keep a pointer to an object
  - declared by an assigment to the variable
- Comments:
  - Line comment: #
  - Block comment: """ ... """

Statements

- Assignments:
  - a = 23
  - a,b = b,a (swap)
  - a = b = c = 23
- **pass** statement: like empty statement in C++
- **if** statement: use indentation for sub-statements
  - **if** <exp>:
    <stmt-list>
    (**elif** <exp>:
    <stmt-list>)*
    (**else**:
    <stmt-list>)?
  - no dangling-else

Loop Statements

- **while**: loop when the condition is true
  - **while** <exp>:
    <stmt-list>
    [**else**:
    <stmt-list>]
  - **else** block is executed when <exp> becomes false
- **for**: iterates over a sequence
  - **for** <var> **in** <sequence>:
    <stmt-list>
    [**else**:
    <stmt-list>]
  - **else** block is executed after iterating all elements of <sequence>
- **break**: like C++ => terminating the loop
- **continue**:like C++ => ignoring the rest of the <stmt-list>

Example

```
for x in range(1,11):
    if (x == 8): break
    print(x)
else: print("loop full")
```

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    if n == 0 **or** n == 1: **return** 1
    else: **return** n ∗ giaitthua(n−1)

- Built-in functions or libraries:

  import <module>
  from <module> **import** <items>
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  - Example

    ```
    import functools
    functools.reduce(lambda x,y:x + y,[1,2,3])
    ```

References I

[1] Python Tutorial, http:w3schools.com/python, 10 08 2020.

[2] Python Programming Language, https://www.geeksforgeeks.org/python-programming-language/, 10 08 2020.

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