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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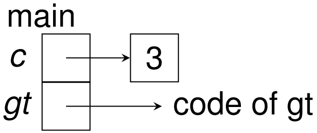

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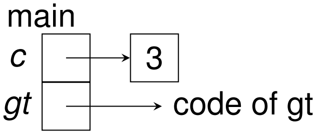

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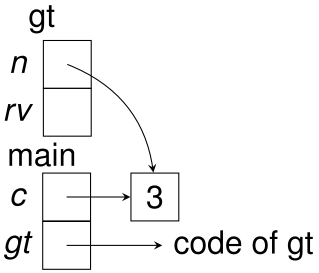

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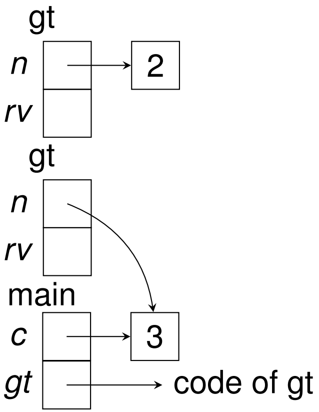

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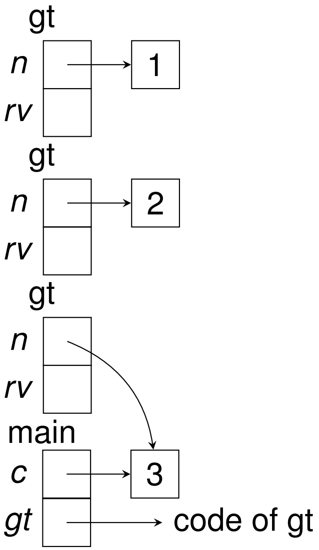

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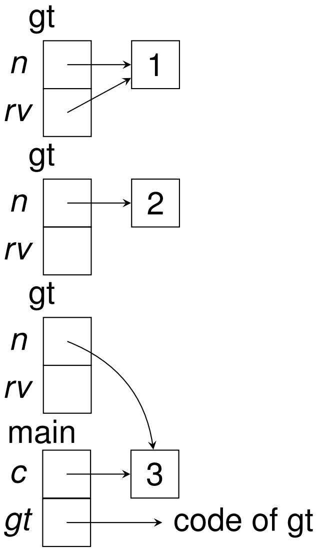

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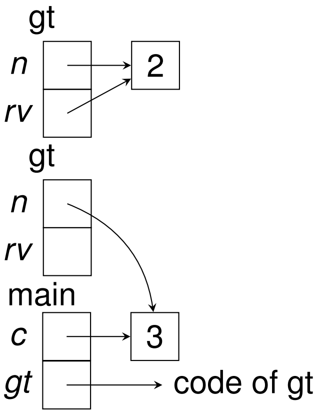

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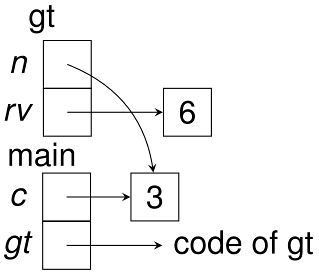

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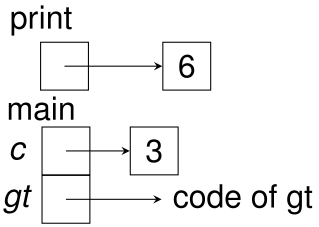

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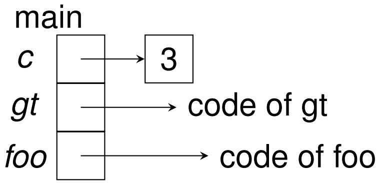

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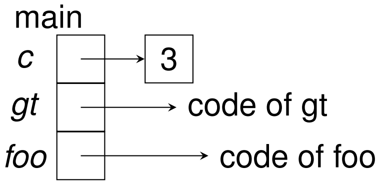

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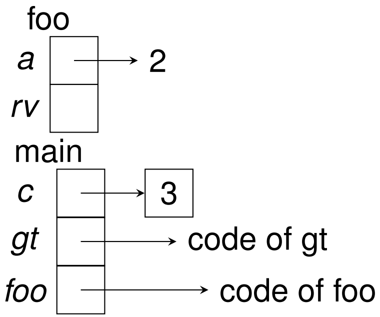

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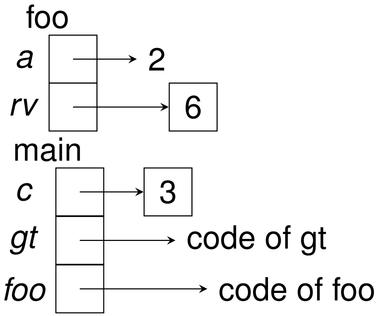

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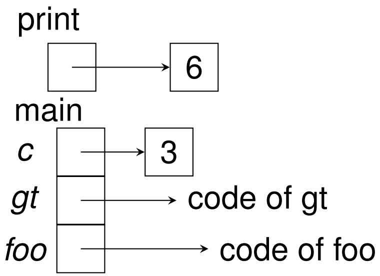

Basic Things

- 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")
```

Functions

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  def <function name>(<parameters>):
     <stmt−list>
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  import <module>
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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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[4] Introduction to Python 3, https://realpython.com/python-introduction/, 10 08 2020.