Statements and Syntax, Part 1

Info 206

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Today's Quiz: http://bit.ly/2w9faHk

Today's Outline

1. Syntax and Semantics
2. Statements
3. Assignments
4. Expressions
5. Print Statements
6. Style Guides

Syntax and Semantics

Syntax

Syntax

The set of rules that define how a program is written and interpreted.

The grammar of a programming language

Semantics

Semantics

The intent of the code

The meaning of the program

Statements

Python program structure

1. Programs are composed of modules.

2. Modules contain statements.

3. *Statements contain expressions.*

4. Expressions create and process objects.

Python Statements

Python Statements

- Assignment
- print calls
- if/elif/else
- for/else
- while/else
- pass
- break
- continue
- del
- def
- return
- global
- import
- from
- class
- try/except/finally
- raise
- assert

Syntactical differences

Java

```java
if (x > y) {
    x = 1;
    y = 2;
}
```

Python

```python
if x > y:
  x = 1
  y = 2
```

Python Syntax

Rules for:

- Assignments
  - Methods of Assignment
  - Keywords
- Expressions
- Printing
- Code formating
  - block indentation
  - Style guides

Syntax example: Loops

```
while True:
  reply = input('Enter text:')
  if reply == 'stop': break
  print(reply.upper())
```

Assignments

Rules of Assignments

- Assignments create object references
- Names are created when first assigned
- Names must be assigned before being referenced
- Some assignments may be implicit (e.g. don't require = statement)

Assignment Statement Forms[*]

Operation	Interpretation
spam = 'Spam	Basic assignment
spam, ham = 'yum', 'YUM'	Tuple assignment
[spam, ham] = ['yum', 'YUM']	List assignment
a, b, c, d = 'spam'	Sequence assignment
a, *b = 'spam'	Extended sequence unpacking
spam = ham = 'lunch'	Multiple-target assignment
spams += 42	Augmented assignments

[*] Lutz Table 11-1

Augmented assignments

```
x = 1
x = x + 1
x
```

```
x = 1
x += 1
x
```

Variable name rules

- must start with a letter or an underscore
- Case sensitive
- Cannot use reserved words

Expression Statements

- Used to call functions and methods (procedural statements)

```
myfunction(arguments) # function calls

myobject.method()
```

- Used for printing values

Print Statements

- In Python 3.x, print() is a function that is used as an expression

```
print([object, ...][, sep=' ']
      [, end='\n'][, file=sys.stout][, flush=False])
```

Python Coding Style

Python Coding Style

PEP 8

https://www.python.org/dev/peps/pep-0008/

Google Python Style Guide

https://google.github.io/styleguide/pyguide.html

Hitchhiker's guide

http://docs.python-guide.org/en/latest/writing/style/

The Zen of Python

```python
import this
```

Group Exercise (Break up into teams)

- Review the PEP 8 (https://www.python.org/dev/peps/pep-0008/)
- Discuss how your team will make decisions about coding style.

End of Meeting #5

For next meeting

- Videos:

  1. Control (19 mins)
  2. while Loops (19 mins)
  3. for Loops (12 mins)
  4. Fancy Loop Exits (23 mins)
  5. Formatting (15 mins)

- Readings:

  - Lutz Chapter 12: If Tests and Syntax Rules
  - Lutz Chapter 13: while and for Loops
  - Lutz Chapter 14: Iterations and Comprehensions