

Python Fundamentals

Modularity

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pluralsight 
hardcore developer training

fred



```
def _int32_to_bytes(i):
    "Convert an integer to four bytes in little-endian format."
    return bytes( (i & 0xff,
                   i >> 8 & 0xff,
                   i >> 16 & 0xff,
                   i >> 24 & 0xff) )

def _bytes_to_int32(b):
    "Convert a bytes object containing four bytes into an integer."
    return b[0] | (b[1] << 8) | (b[2] << 16) | (b[3] << 24)
```

sheila

```
def fetch_words():
    with urlopen('http://sixty-north.com/c/t.txt') as story:
        story_words = []
        for line in story:
            line_words = line.decode('utf8').split()
            for word in line_words:
                story_words.append(word)
    return story_words
```

```
def print_items(items):
    for item in items:
        print(item)
```

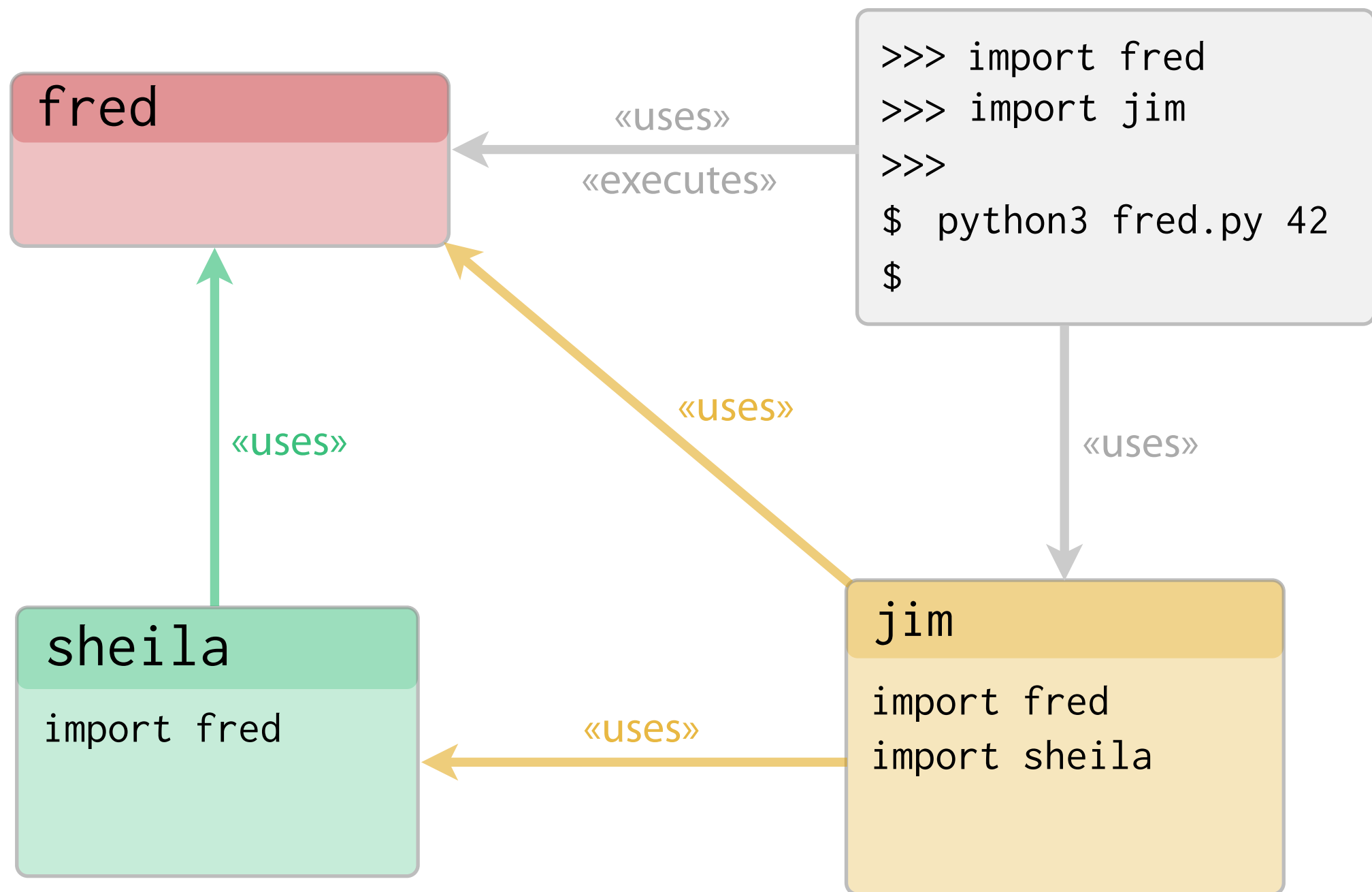
```
def main():
    url = sys.argv[1]
    words = fetch_words(url)
    print_items(words)
```

jim

```
def console_card_printer(passenger, seat, flight_number, aircraft):
    output = "| Name: {0}" \
            " Flight: {1}" \
            " Seat: {2}" \
            " Aircraft: {3}" \
            "|".format(passenger, flight_number, seat, aircraft)
    banner = '+' + '-' * (len(output) - 2) + '+'
    border = '|' + ' ' * (len(output) - 2) + '|'
    lines = [banner, border, output, border, banner]
    card = '\n'.join(lines)
    print(card)
    print()
```

```
def make_flight():
    f = Flight("BA758", Aircraft("G-EUPT", "Airbus A319",
                                  num_rows=22, num_seats_per_row=6))
    f.allocate_seat('12A', 'Guido van Rossum')
    f.allocate_seat('15F', 'Bjarne Stroustrup')
    f.allocate_seat('15E', 'Anders Hejlsberg')
    f.allocate_seat('1C', 'John McCarthy')
    f.allocate_seat('1D', 'Richard Hickey')
    return f
```







Special attributes in Python are
delimited by **double underscores**



__name__

Evaluates to “__main__” or the actual module name
depending on how the enclosing module is being used.

The Python Execution Model ★

When are functions defined?

What happens when a module is imported?



pythonTM

**module,
script
or
program?**

Python module

Convenient import with API



Python script

Convenient execution from
command line

Python program

Perhaps composed of many
modules

Python module

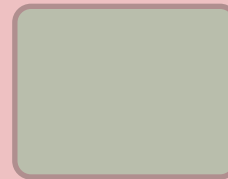
Python script

Convenient execution from
command line

Convenient import with API

Python program

Perhaps composed of many
modules



Python program

Perhaps composed of many
modules

It doesn't have to be called this!



Setting up a `main()` function with a `command line argument`



Advanced command line argument parsing:

- Python Standard Library: **argparse**
- Many third-party options such as **docopt**

Moment of Zen

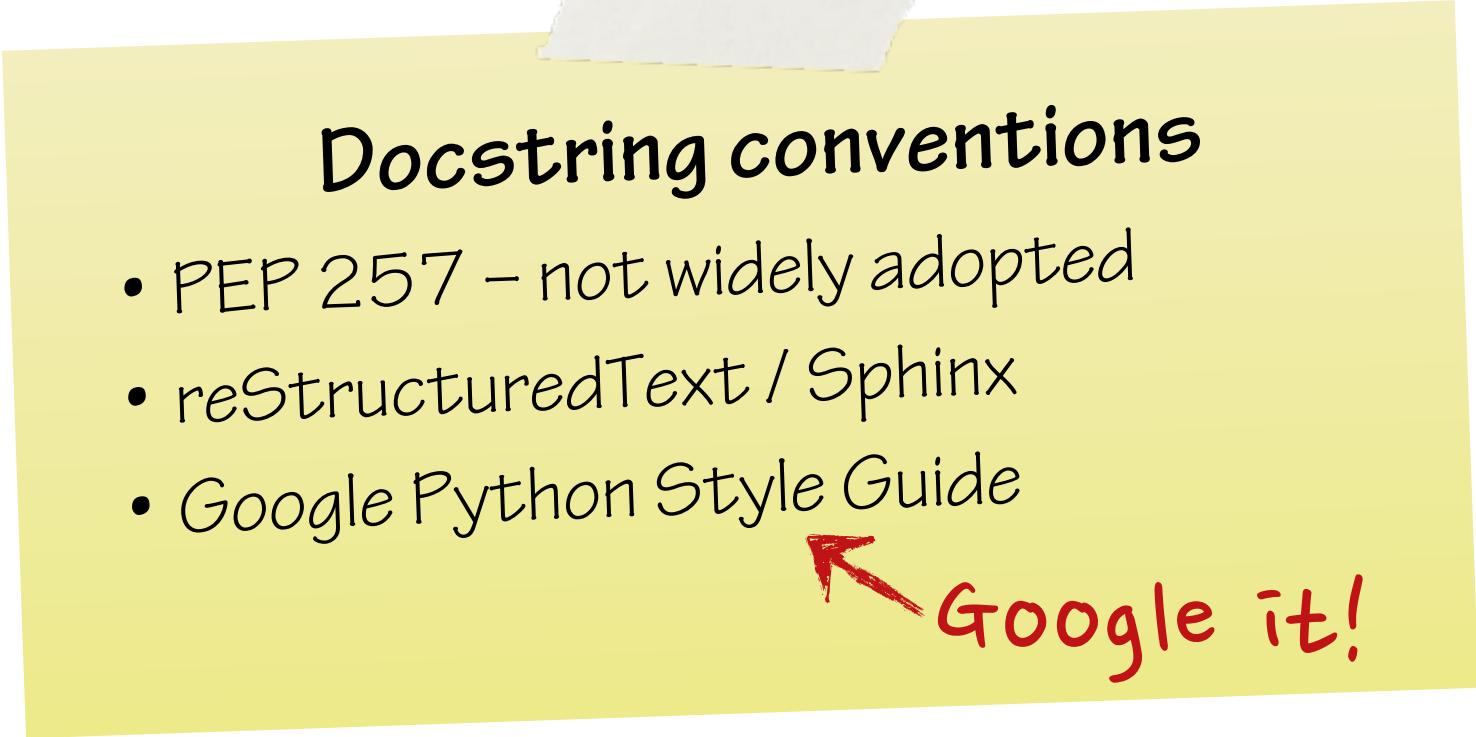
Sparse is better
than dense

Two between functions
That is the number of lines
PEP eight recommends



"""Documenting your code.

Using docstrings. ★
"""



Docstring conventions

- PEP 257 – not widely adopted
- reStructuredText / Sphinx
- Google Python Style Guide

↖ Google it!

Comments ★





Windows



python™

PyLauncher ★

- executable is `py.exe` and is on the PATH
- associated with `*.py` files
- parses Unix-style shebangs to locate the correct Python interpreter version
- `#!/usr/bin/env python3` works on Windows

Available from
Python 3.3



Modularity – Summary

- Python code is placed in *.py files called “modules”
- Modules can be executed directly with
`python module_name.py`
- Brought into the REPL or other modules with
`import module_name` ★
- Named functions defined with the `def` keyword
`def function_name(arg1, argn):`
- Return from functions using `return` keyword with optional parameter
- Omitted `return` parameter or implicit `return` at end returns `None`
- Use `__name__` to determine how the module is being used
- If `__name__ == "__main__"` the module is being executed
- Module code is executed exactly once, on first import
- `def` is a *statement* which binds a function definition to a name



Modularity – Summary

- Command line arguments are accessible through `sys.argv`
- The script filename is in `sys.argv[0]`
- Docstrings are a standalone literal string as the first statement of a function or module
- Docstrings are delimited by triple quotes
- Docstrings provide `help()`
- Comments begin with `#` and run to the end of the line
- A special comment on the first line beginning `#!` controls module execution by the program loader