

Boost  
Maintainability

File "api.py", line 101, in generate\_response  
page + next\_page

TypeError:

Can't convert 'int' object to str implicitly

page

+

next\_page

?

```
next_page = page+1  
page = make_html(...)
```

!

“

We read lines **randomly**.

”

```
next_page_no = page_no+1  
page_html = make_html(...)
```



page\_html

+

next\_page\_no

!

“

# Making wrong code look wrong

— *Joel on Software*

”

# Making Wrong Code Look Wrong

—Joel on Software

- “Making Wrong Code Look Wrong”
  - <http://bit.ly/joel-wrong>
- This talk will be more systemic than it.
- but exception is good, IMO.

# Maintainability

“  
To understand a random line,  
**the lines** you need to read back.

”

Time is just



# Mosky

❤️ Python & open source

- Python Charmer at Pinkoi
- Spoken at conferences
  - TEDxNTUST
  - PyCon TW, JP, SG, HK, etc.
- Owns Python packages
  - Clime, MoSQL, etc.
- Teaching Python!
- more: [mosky.tw](http://mosky.tw)



# We're looking for Data & Backend Engineers

The image shows the homepage of the Pinkoi website. At the top, the Pinkoi logo is displayed with a red heart icon. To the right of the logo are three navigation links: "Shop" (with a shopping cart icon), "Wall" (with a wall panel icon), and "Windows" (with a window frame icon). Below the navigation bar, a statistic "423017 unique items" is shown next to a search bar with the placeholder "Search for great designs". A section titled "Trending Now" features a grid of six images representing different product categories: a woman in a striped dress, a woman in a grey top and black skirt, a pink calla lily, a white bowl with a blue sprig, a blue notebook, and a pair of white shoes.

Shop Wall Windows

423017 unique items

Trending Now Check out the most recommended items to

Shoes & Bags Accessories Home & Living

# Boost Maintainability

- Define our “Maintainability”
  - lines need to read back
- Making It Zero
- Progressive From Zero



# Making It Zero

# A Dominant Rule

“

Be exact & consistent.

”

**result** = ...  
**result** = ...

X

**resp =** ...

**parsed\_dict =** ...



**user = User(user\_id)**

**buyer = user\_id**

**X**

```
buyer = User(user_id)  
buyer_id = user_id
```



# Get a dictionary, please.

Word of the Day   Translate   Games   Blog

 definitions ▾  

# dic·tion·ar·y

 [dik-shuh-ner-ee]

[CITE](#) [Examples](#) [Word Origin](#)  
[A⇒あ](#) [See more synonyms on Thesaurus.com](#)

noun, plural **dic·tion·ar·ies**.

1. a book, optical disc, mobile device, or online lexical resource (such as [Dictionary.com](#)) containing a selection of the words of a language, giving information about their meanings, pronunciations, etymologies, inflected forms, derived forms, etc., expressed in either the same or another language; [lexicon](#); [glossary](#). [Print dictionaries of various](#)

# Ops Hint

page = ...



page\_no = ...

page\_html = ...



**requested\_fields**  
&  
**allowed\_fields**

?

**set(requested\_fields)**

**&**

**allowed\_field\_set**



**user = User(...)**

**User = {}**

**?**

**user = User(...)**

**user\_d = {}**



```
resp = requests.get(...)
```

`resp.text`

`resp.json`

?

`resp.text`  
`resp.json()`

!

`resp.text`

`resp.parse_as_json()`



**Req.is\_secure()**

**is\_secure = True**

**X**

**secure = True**

**with\_tls = True**



`req_is_secure = True`  
`to_use_tls = True`



# Ops Hint

## The General Rules

- Hints which **ops you should use**.
- **\_no:** numeric
- **<plural>:** sequence, usually is mutable sequence (list)
- **\_<type>:** if no intuitive way
- **\_<abstract type>**
  - **\_seq:** for sequence
  - **\_gen:** for generator

# Ops Hint

## for Callable

- <verb>\_, = imperative sentence
- <yes-no question> → boolean
- to\_<thing> → thing

# Ops Hint

## for Boolean

- Normal objects take *<noun>*
- Callables take *<verb>\_* and *<yes-no question>*
- so use
  - *<adj>*
  - *<prep>\_*
  - *<simple sentence>*
  - *<to-infinitive>*

# Ops Hint

## for Return Value

- Use on the **return value**,
  - `get_page_no` → numeric  $\geq 1$
  - `query_user` → user object
  - `parse_to_tree` → tree object

# Ops Hint

## Explicit Unknown

- `_x: anything`
  - rather than an ambiguous name.
  - You won't forget to determine the ops it supports.
  - Use `hasattr` or `isinstance` later.

# Ops Hint

## So, avoid None

- Consider:
  - `user = query_user(uid)`  
`user.is_valid()`
  - Then `query_user` returns `None`
    - **Boom!** An `AttributeError!` ∵ `None` supports almost no op.
  - Accept an exception?
    - Y: **just raise** when you wanna return `None`.
    - N: **use a dummy object** like a dummy user or an empty str, etc.

```
tmpl = '<p>{}</p>'  
tmpl.format(name)
```

**name = '<script>...</script>'**

!

```
tmpl_html = ...
tmpl_html.format(
    escape_to_html(name)
)
```



`arg = parse(arg)`

?

**arg\_d = parse(arg\_json)**



# Ops Hint

str/x

- `_key`: key (of a dict)
  - '*lowercase\_n\_underscore*'
  - or just *k*
- `_url`: URL
  - percent-encode
- `_json`: JSON
  - JSON is a string, actually
- `_html`: HTML
  - avoid XSS
- `_sql`: SQL
  - avoid SQL injection

# Ops Hint

numeric/x

- **\_no:** number, #
  - $\geq 1$
- **\_idx:** index
  - $\geq 0$
  - or just  $i, j, k$
- **\_secs**
  - It's seconds!
- **\_pct**
  - $n = 10\%$
  - $n\_pct = 10$
- **\_month, \_day, ...**
  - use month\_str if in string

# Structure Hint

# users

?

```
users = {  
    'mosky': 'mosky.tw@gmail.com',  
    ...  
}
```

```
uid_email_map = {  
    'mosky': 'mosky.tw@gmail.com',  
    ...  
}
```

**uid\_email\_map**



`uid_email_pairs = ...`

`uid_email_map = dict(↑)`



```
# select uid, email  
for uid, email in uid_email_pairs:  
    ...
```



# Structure Hint

## for dict & tuple

- <key>\_<value>\_map
- tuple
  - \_pair: 2-tuple
  - \_pairs: 2-tuples
  - <1st>\_<2nd>\_<3rd>\_tuple: n-tuple

# Others

# Private Hint

“Don't use me!”

- `_<name>`
- **Don't use when out of**
  - a module
  - a class
- **Don't guarantee the behavior.**
- **Make it easier to trace and refactor.**

# Performance Hint

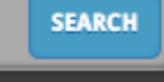
“Should I cache it?”

- **get\_**: memory op
- **parse\_ / calc\_** : CPU-bound op
- **query\_**: IO-bound op
- **query\_or\_get\_**: IO-bound op with cache

Progressive  
From Zero

# Too long? Use proper abbreviation.

The STANDS4 Network  Login

 template 

Abbreviation » Term  
Term » Abbreviation  
Word in Term

# A B C D E F G H I J K L M N O P Q R S T U V W X Y Z | NEW RANDOM

What is the abbreviation for **template**?  

We've found a total of **2** shorthands for **template**:

Filter by: Select category from list... Sort by: Popularity Alphabetically Category

Acronym	Definition	Options	Rating
TPL	TemPLate Computing	Rate it:	
TMPL	TeMPLe Computing » Software	Rate it:	

Define in  
Comment

**receiver\_address\_dict**

```
# rad: receiver addr dict  
rad = ...
```

# Paragraph & Section

```
def request_or_get(url):  
  
    if has_cache(url):  
        return get_cache(url)  
  
    content = request(url)  
    set_cache(url, content)  
  
    return content
```

## # Check Arguments

...

...

## # Query from Tables

...

...

...

...

## # Transform

...

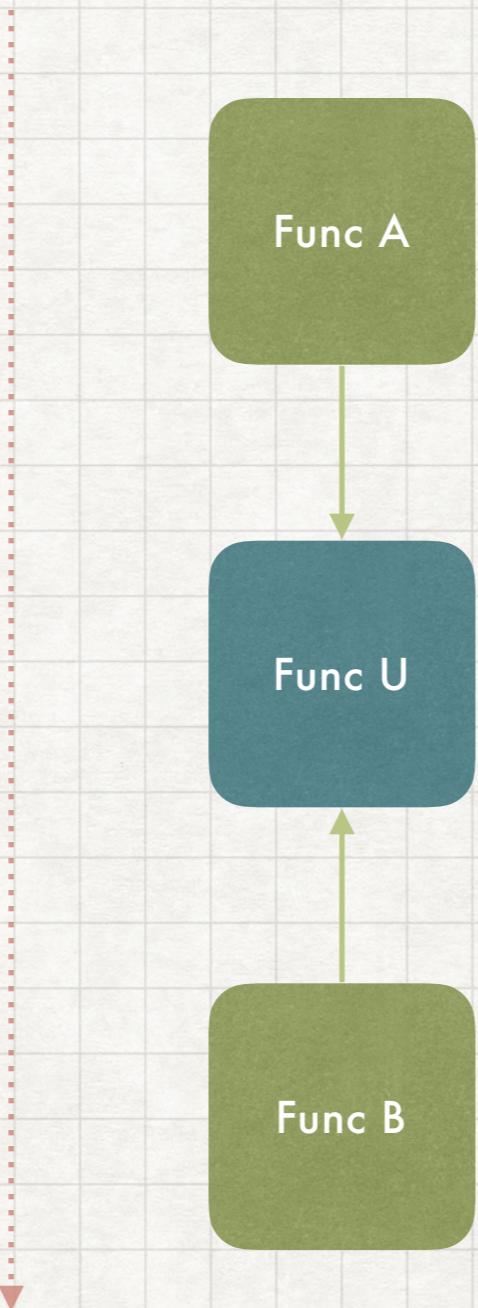
# Paragraph & Section

## With Blank Line and Comment

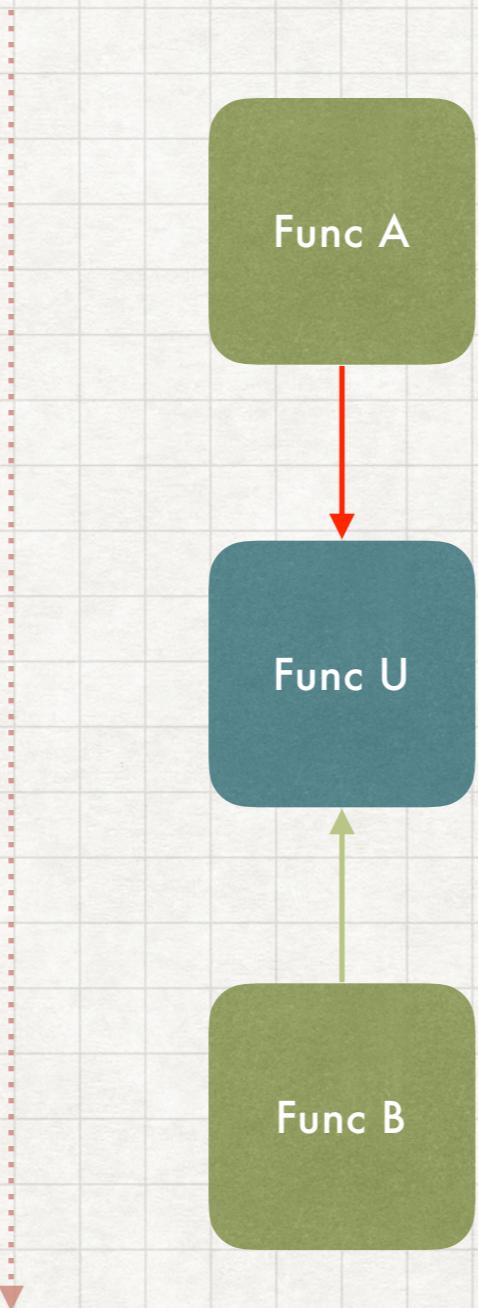
- Like writing reStructuredText or Markdown.
- Paragraph
  - A paragraph contains no blank line.
  - A **blank line** separates paragraphs.
- Section
  - A Section contains paragraphs.
  - A “**title comment**” separates sections.
  - is a semi-function.

# Line Functions Up

Line No

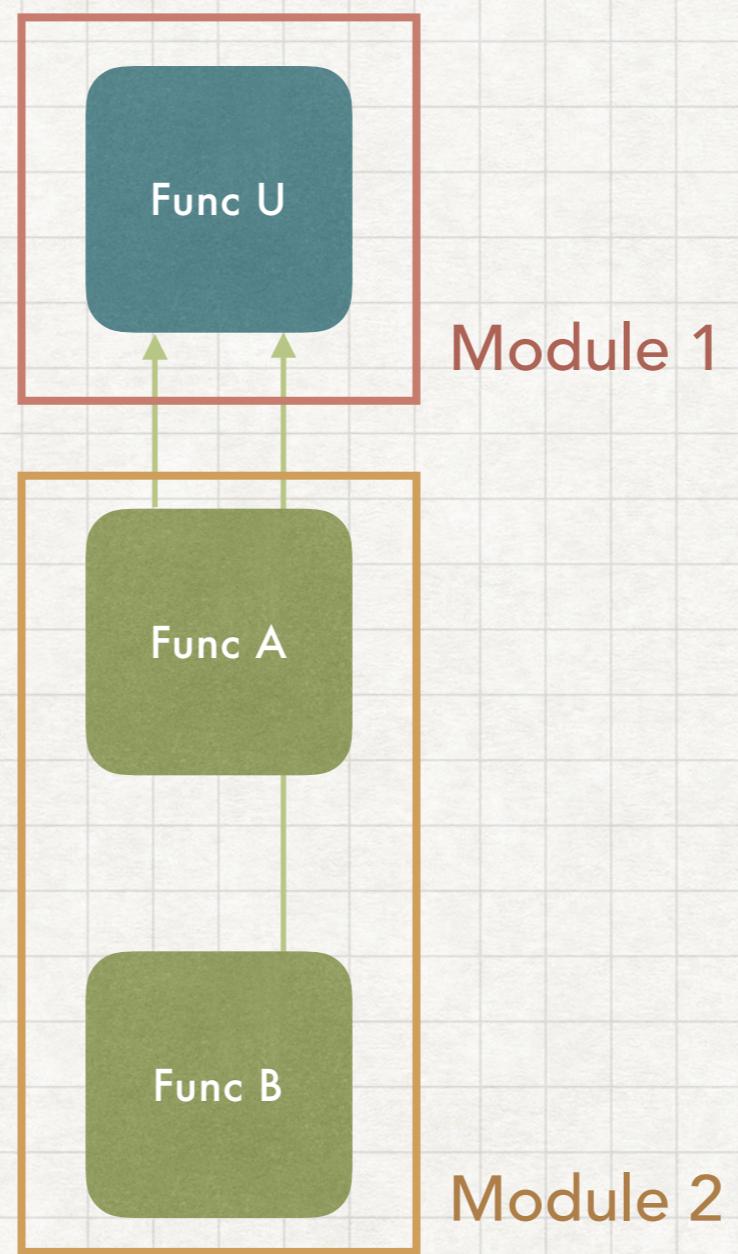


Line No



Line No





# Line Functions Up by Calls

- Measure the “disorderedness”.
- In a file,
  - keep the lines has **same direction**
  - **layer functions**, and may → modules
- In a project,
  - apply it to modules

Face  
Bad Smell

# Face Bad Smell

Don't lost!

- Comment
  - pitfalls: the actual return type, side effects
  - # TODO:
- Seal it with better name or stabler wrapper
  - *good = poor()*
  - *def good(): poor()*
- Stay focused!

Use hints to  
boost maintainability!

