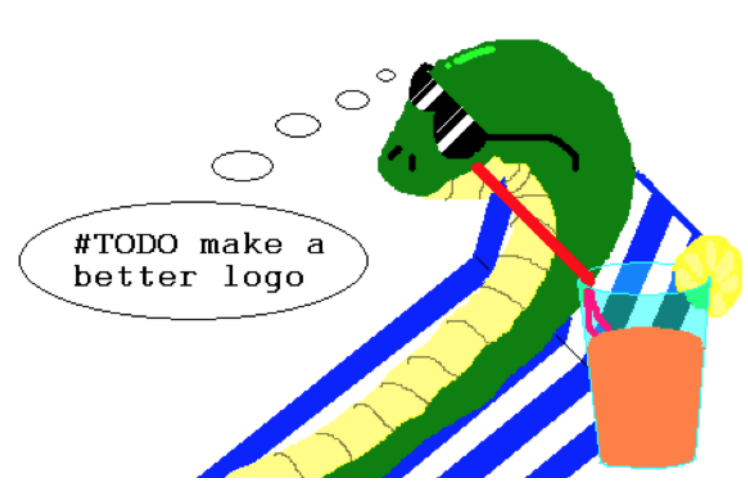
Pycrastinate

TODO less, DO more

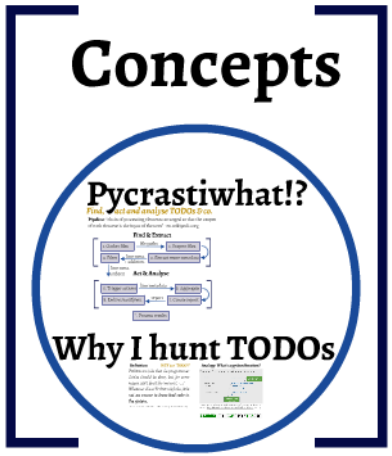
by *Isaac Bernat*

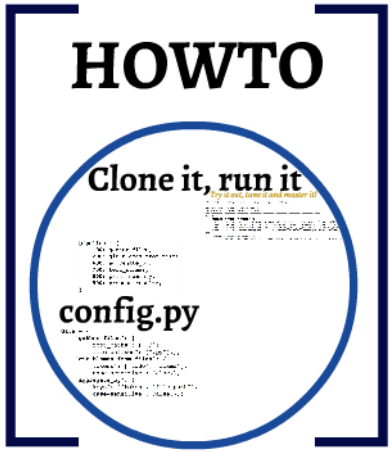
May 20 - 2014

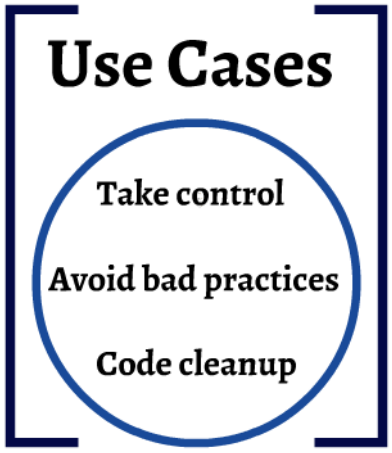


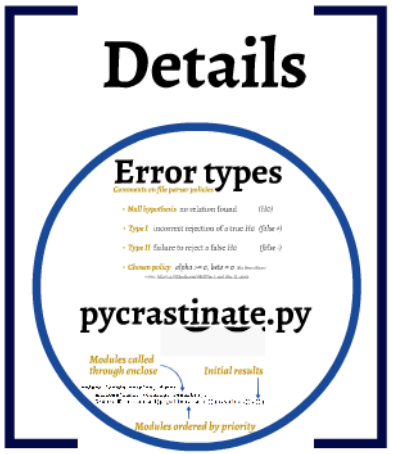
github.com/
isaacbernat

PYCON
SWEDEN









Pycrastinate

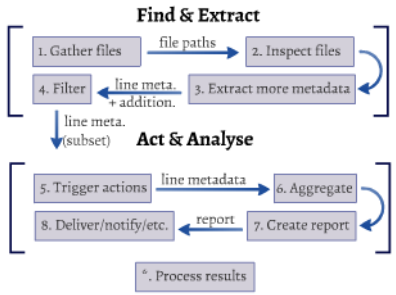
TODO less, DO more

Concepts

Pycrastiwhat!?

Find, act and analyse TODOs & co.

Pipeline: "chain of processing elements arranged so that the output of each element is the input of the next" - en.wikipedia.org



Why I hunt TODOs

Definition *WTF is a "TODO"?*

TODOs are jobs that the programmer thinks should be done, but for some reason can't do at the moment. [...] Whatever else a TODO might be, ***it is not an excuse to leave bad code in the system.***

source: Robert C. Martin, "Clean Code – A Handbook of Agile Software Craftsmanship"

Analogy: What's a python function?

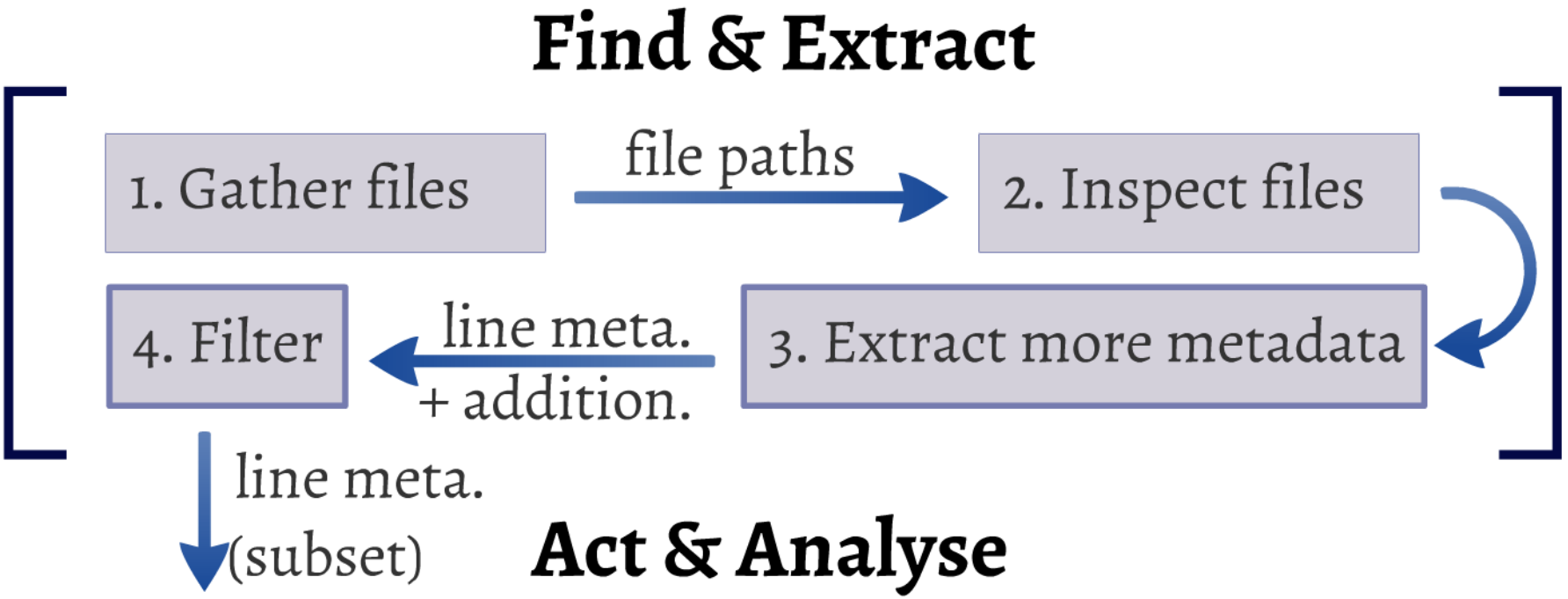
Modern C++: What You Need to Know - April 5, 2014 - Herb Sutter
source: http://channel9.msdn.com/Events/Build/2014/2-661 at 10:40

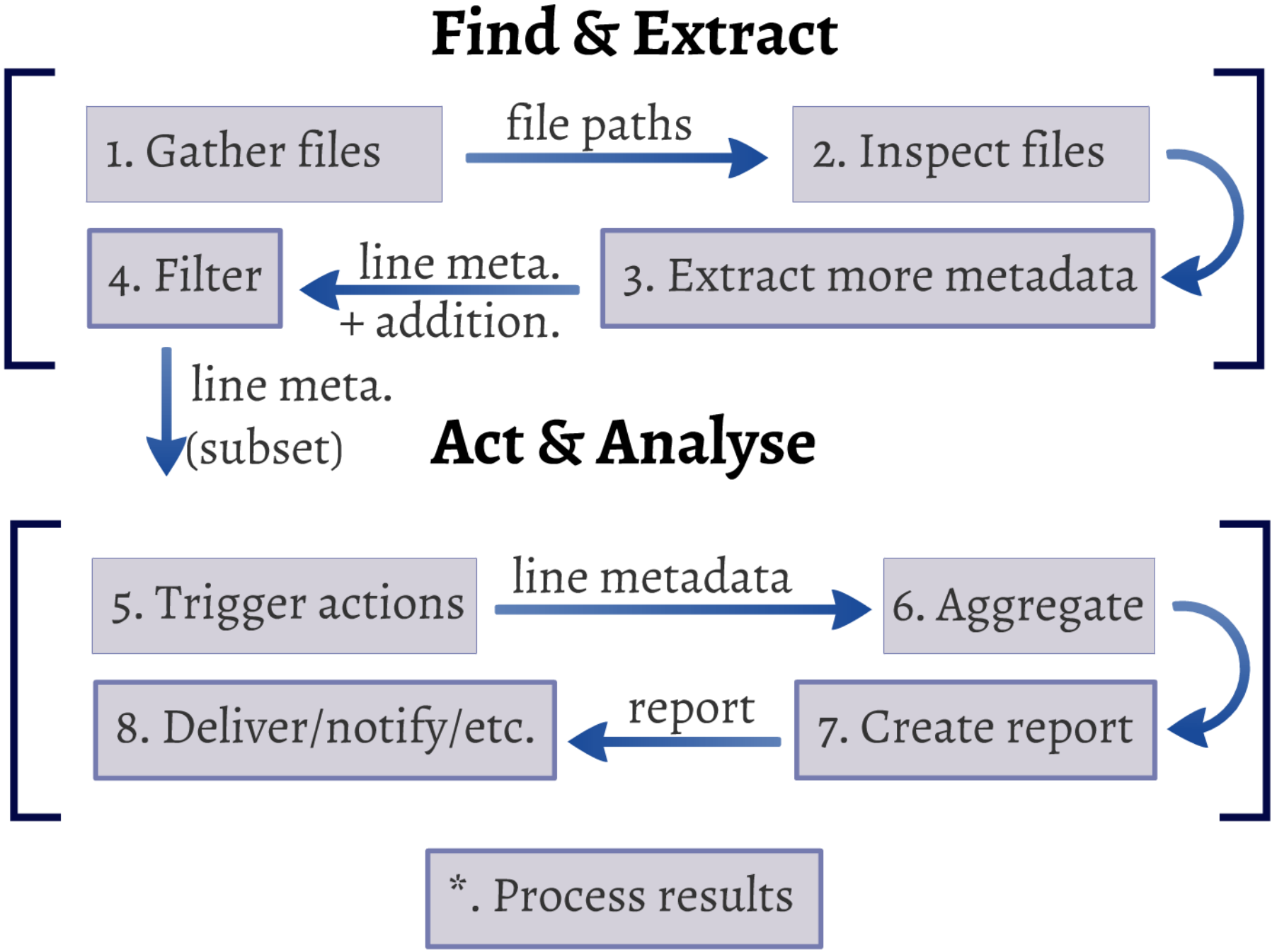
```
lambda s: sum(s)/len(s)
```

Pycrastin

Find, act and analyse TODOs & co.

Pipeline: "chain of processing elements arranged so that the output of each element is the input of the next" - en.wikipedia.org





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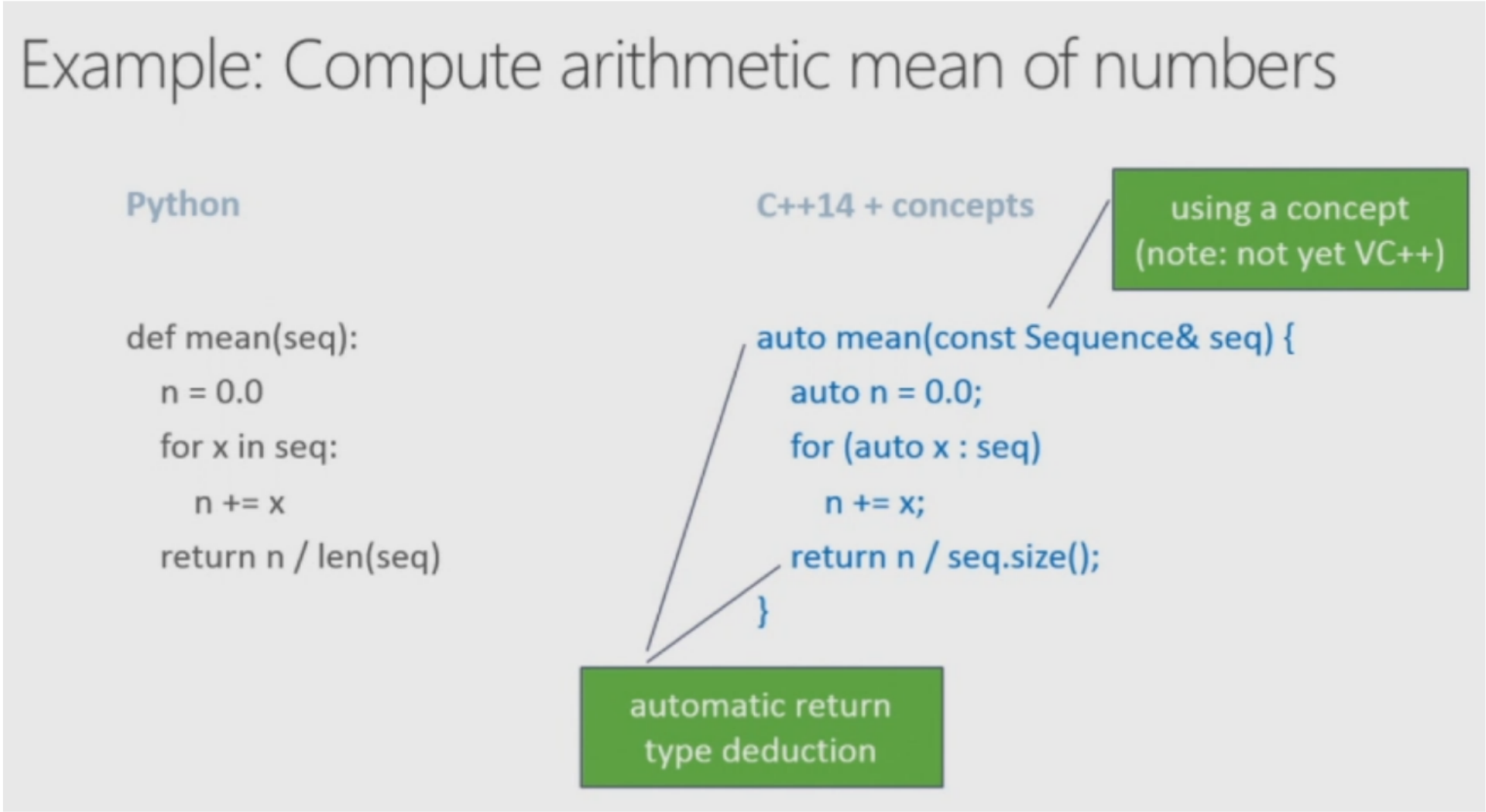
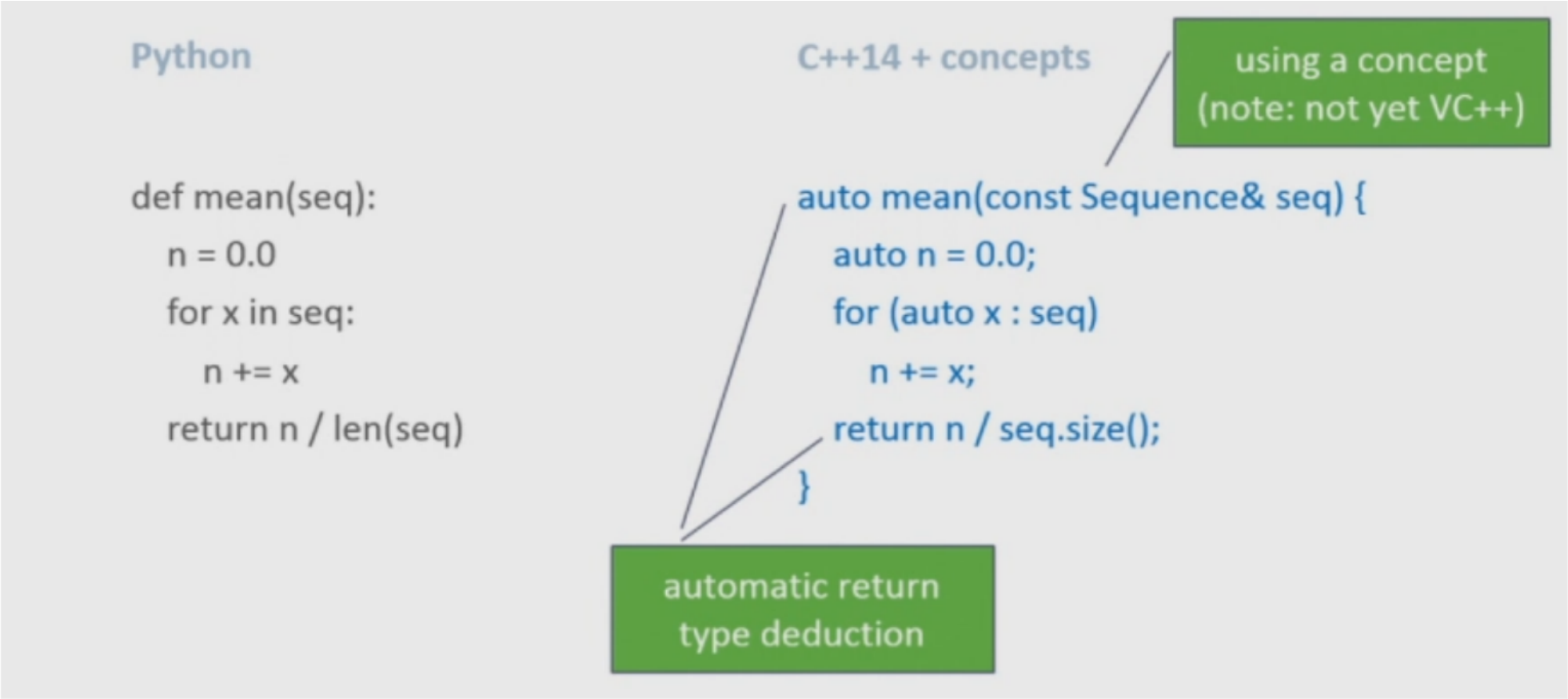


Modern C++: What You Need to Know - April 3, 2014 - Herb Sutter
source: http://channel9.msdn.com/Events/Build/2014/2-661 (at 10:48)



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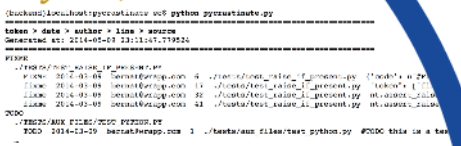
```
lambda s: sum(s)/len(s)
```

HOWTO

Clone it, run it

Try it out, tune it and master it!



```
pipeline = {
    100: gather_files,
    200: git_blames_from_files,
    600: aggregate_by,
    700: text_summary,
    800: print_summary,
    900: process_results,
}
```

config.py

```
data = {
    "gather_files": {
        "root_paths": ["./"],
        "file_sufixes": [".py"],},
    "git_blames_from_files": {
        "tokens": ["todo", "fixme"],
        "case-sensitive": False,},
    "aggregate_by": {
        "keys": ["token", "file_path"],
        "case-sensitive": False,},}
```


```
(backend)localhost:pycrastinate ec$ python pycrastinate.py
================================================================================
token > date > author > line > source
Generated at: 2014-05-09 23:11:47.779524
================================================================================
FIXME
  ./TESTS/TEST_RAISE_IF_PRESENT.PY
    FIXME  2014-03-09  bernat@wrapp.com  6   ./tests/test_raise_if_present.py  {'c
    fixme  2014-03-09  bernat@wrapp.com  17   ./tests/test_raise_if_present.py  "t
    fixme  2014-03-09  bernat@wrapp.com  32   ./tests/test_raise_if_present.py  nt
    fixme  2014-03-09  bernat@wrapp.com  41   ./tests/test_raise_if_present.py  nt
TODO
  ./TESTS/AUX_FILES/TEST_PYTHON.PY
    TODO  2014-03-09  bernat@wrapp.com  1   ./tests/aux_files/test_python.py  #TOI
  …
```

```
pipeline = {
    100: gather_files,
    200: git_blames_from_files,
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    800: print_summary,
    900: process_results,
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    "git_blames_from_files": {
        "tokens": ["todo", "fixme"],
        "case-sensitive": False,},
    "aggregate_by": {
        "keys": ["token", "file_path"],
        "case-sensitive": False,},}
```

Use Cases

Take control

Avoid bad practices

Code cleanup

Take control

over creeping FIXMEs

1) Search code for FIXMEs*
2) Filter >90 and <15 days old
3) Email report to assess severity

Add *exclude* and *send_email* modules

```
from datetime import date, timedelta
pipeline = dict(list(pipeline.items()) + [(400, exclude), (810, send_email)])
data = dict(list(data.items()) + list({
    "exclude": {
        "date": [{
            "values": [timedelta(15)],
            "functions": [lambda data, value: date.today() - data < value]
            }, {
            "values": [timedelta(90)],
            "functions": [lambda data, value: date.today() - data > value]
        }, ], },
    "send_email": {
        "to": ["hello@email.com"], "from": "example@email.com",
        "username": "example@email.com", "password": "1234",
        "smtp_name": "smtp.email.com", }, }.items()))
```

```
"exclude":  {
    "date": [{
        "values": [timedelta(15)],
        "functions": [lambda data, value: date.today() - data < value],
        }, {
        "values": [timedelta(90)],
        "functions": [lambda data, value: date.today() - data > value],
    }, ], },
```

Avoid bad practices

breaking Continuous Integration builds

1) Search public API for *kwargs**
2) Filter >180 days old
3) Raise `AssertionError`

```
pipeline = dict(list(pipeline.items()) +
                [(400, filter_by_age),
                 (500, raise_if_present)])
data = dict(list(data.items()) + list({
    "raise_if_present": {
        "case-sensitive": False,
        "token": ["kwargs"],
    }, "filter_by_age": {
        "oldest": 180, "earliest": -1,
    }, }.items()))
```

Add *raise_if_present* and *filter_by_age* modules

```
"filter_by_age":  {
    "oldest": 180, "earliest": -1, }
```

Code cleanup

remove TODOs from an old stable codebase

1) Search for TODOs, XXXs, HACKs...
2) Filter out those <6 months old*
3) Email reports to committers
   with "1-click-distance" links

New pipeline: *gather_git_blames_shell*, *aggregate_by*, and *send_aggregated_email* modules

```
pipeline = {100: gather_git_blames_shell, 600: aggregate_by,
            610: send_aggregated_email, 900: process_results}
data = {"send_aggregated_email": {
    "cc": ["me@email.com"], "from": "me@example.com",
    "username": "me@example.com", "password": "1234",
    "smtp_name": "smtp.email.com", "concurrent": True,
    "render_function": html_summary,
    "html_summary": {"css": ["td{font-family: monospace}"]},
    }, "gather_git_blames_shell": {
    "init_path": "./", "tokens": ["todo", "xxx", "hack"],
    "file_sufixes": [".py", ".rb"],
    }, "aggregate_by": {
    "keys": ["email", "token", "file_path"]}}
```

```
data = {"send_aggregated_email": {
    "render_function": html_summary,
    "html_summary": {"css": ["td{font-family: monospace}"]},
    "cc": ["me@email.com"], "from": "me@example.com",
    "username": "me@example.com", "password": "1234",
    "smtp_name": "smtp.email.com", "concurrent": True,
```

Pycrastinate HTML report

Generated at: 2014-05-16 15:51:03.083690

TODO

CONFIG.PY

token	date	email	line_count	file_path	code
todo	2014-05-16	not.committed.yet	15	config.py#L15	"tokens": ["todo", "xxx", "hack"],

TESTS/AUX_FILES/TEST_PYTHON.PY

token	date	email	line_count	file_path	code
TODO	2014-03-09	bernat@wrapp.com	1	tests/aux_files/test_python.py#L1	#TODO this is a test

Details

Error types

Comments on file parser policies

- ***Null hypothesis*** no relation found *(Ho)*
- ***Type I*** incorrect rejection of a true *Ho* *(false +)*
- ***Type II*** failure to reject a false *Ho* *(false -)*
- ***Chosen policy*** *alpha >= 0, beta = 0* (like bloom filters)

source: http://en.wikipedia.org/wiki/Type_I_and_type_II_errors

pycrastinate.py

Modules called through enclose

Initial results

```
reduce(lambda results, func:
   enclose(func, (config, results)),
   OrderedDict(sorted(pipeline.items())).values(),[])
```

Modules ordered by priority

Error types

Comments on file parser policies

- ***Null hypothesis*** no relation found *(Ho)*
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pycrastinate

```python
import config
from collections import OrderedDict
from functools import reduce


def run(pipeline=config.pipeline, config=config.data, enclose=config.enclose):
    return reduce(lambda results, func: enclose(func, (config, results)),
                  OrderedDict(sorted(pipeline.items())).values(), [])

if __name__ == "__main__":
    run()
```

Modules called through enclose

Initial results

```
reduce(lambda results, func:
    enclose(func, (config, results)),
    OrderedDict(sorted(pipeline.items())).values(),[])
```

Modules ordered by priority

Why use pycrastinate?

a summary of key arguments

- **Convenience** Use it out of the box. No weird formats.
- **No setups** The only dependency is python 2.7/3.3+
- **Modularity** Easily extensible to meet your needs.
- **Speed** (django) <3.5 sec. >240k lines, >1.7k .py, >60 hits

found 2 TODOs from 2006 (!)

github.com/
isaacbernat

PYCON
SWEDEN

TODO: ask for questions

by *Isaac Bernat*

May 20 - 2014

Pycrastinate

TODO less, DO more

Enclose

```
from datetime import datetime


def print_log(func, params):
    log_func_info = "pycrastinate module: " + func.__name__
    print("{} start  {}".format(datetime.now(), log_func_info))
    results = func(*params)
    print("{} finish {}".format(datetime.now(), log_func_info))
    return results


def no_closure(func, params):
    return func(*params)
```

gather_git_blames_shell

```
def get_blames_lines():
    include_sufixes = u'" --include "*{}"'.format(u'" --include "*'.join(
        config["file_sufixes"])) if config["file_sufixes"] else '"'

    case_sensitive = config.get("case-sensitive", False)
    insensitive = "" if case_sensitive else "-i"
    grep = 'grep -E -n {} "{}{} -R {}'.format(
        insensitive, regex["raw_tokens_re"],
        include_sufixes, config["init_path"])
    cut = 'cut -d: -f1,2'
    awk = " ".join([
        "awk '{",
        'FS= ":";',
        'split($1, path, "/");',
        'paths="";',
        'fn=path[length(path)];',
        'for(i=0; i<length(path)-1; i++)(paths=paths "/" path[i]);',
        'print "-C " paths "/ blame --line-porcelain -L" $2"," $2 " " fn',
        "}'"])
    sed = 'sed s"/\/\///; s/\:.*//"'
    xargs = 'xargs -P4 -n6 git'
    cat = 'cat'
    one_liner = " | ".join([grep, cut, awk, sed, xargs, cat])

    return subprocess.Popen(one_liner, stdout=subprocess.PIPE, shell=True)\
        .stdout.read().decode("utf-8").split("\n")
```

```
    cut = 'cut -d: -f1,2'
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        .stdout.read().decode("utf-8").split("\n")
```

"one-liner"

```
grep -E -n -i "todo|fixme" --include "*.py" --include "*.rb" -R ./ |
cut -d: -f1,2 |
awk '{ FS= ":"; split($1, path, "/"); paths=""; fn=path[length(path)];\
    for(i=0; i<length(path)-1; i++)(paths=paths "/" path[i]);\
    print "-C " paths "/ blame --line-porcelain -L" $2"," $2 " " fn }' |
sed s"/\/\///; s/\:.*//" |
xargs -P4 -n6 git |
cat
```