Teeing up Python

Code Golf

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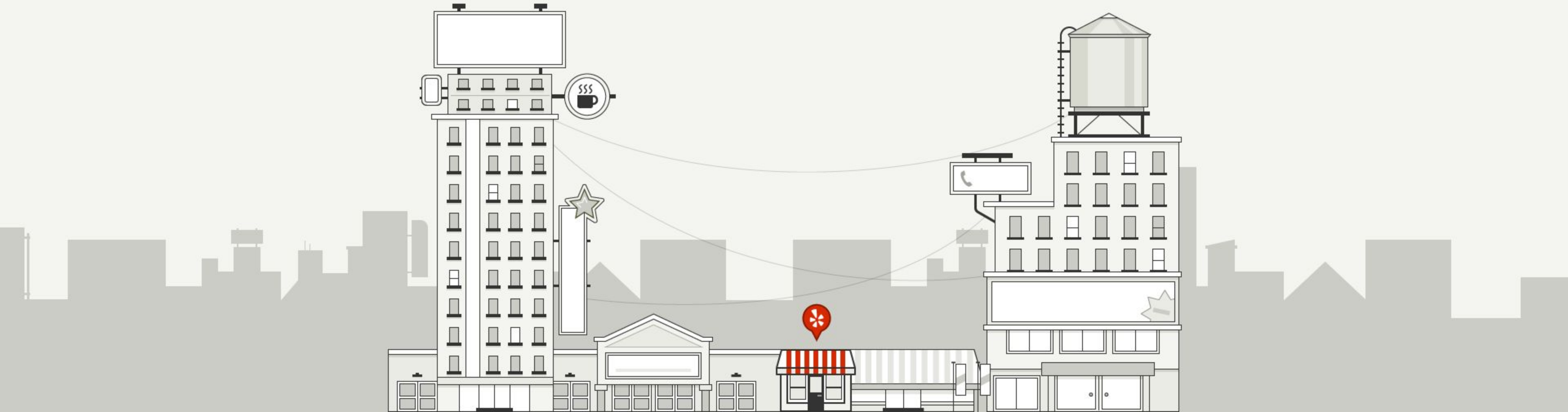
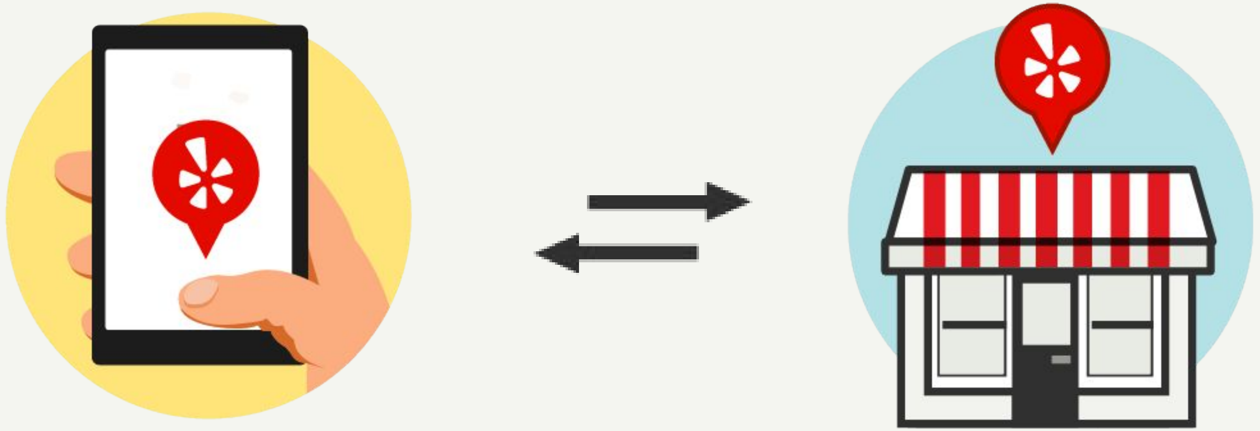


Yelp's Mission

Connecting people with great local businesses.



About Me

Engineer at yelp in London building distributed systems.

Previous stints:

amazon wibidata Dropbox

WARNING

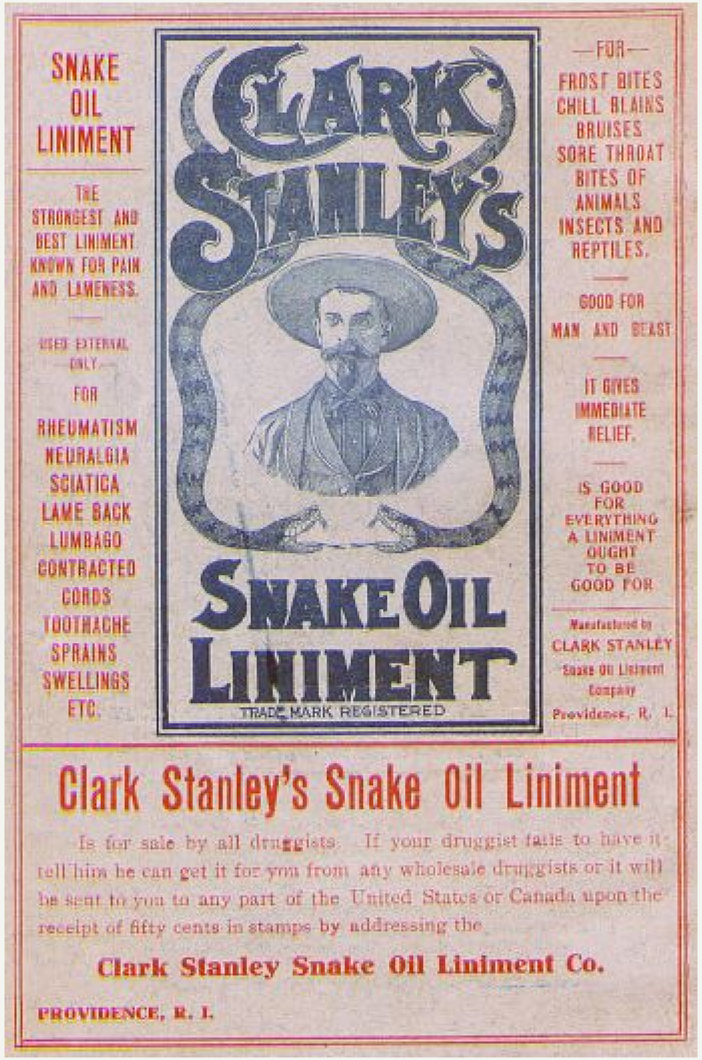
- Not actually a golf player.
- Not talking about traditional “code golfing”
- Monospace type ahead!

Code Golfing

Code Golfing is minimizing the number of strokes in each block of code.

Concise code requires less cognitive load to understand the intent by avoiding implementation errata.

“brevity is the soul of wit” - @WilliamShakespeare


SNAKE OIL LINIMENT
THE STRONGEST AND BEST LINIMENT KNOWN FOR PAIN AND LAMENESS.
USED EXTERNAL ONLY
FOR RHEUMATISM NEURALGIA SCIATICA LAME BACK LUMBAGO CONTRACTED CORDS TOOTHACHE SPRAINS SWELLINGS ETC.
CLARK STANLEY'S
SNAKE OIL LINIMENT
TRADE MARK REGISTERED
—FOR— FROST BITES CHILL BLAINS BRUISES SORE THROAT BITES OF ANIMALS INSECTS AND REPTILES.
GOOD FOR MAN AND BEAST
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IS GOOD FOR EVERYTHING A LINIMENT OUGHT TO BE GOOD FOR
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Is for sale by all druggists. If your druggist fails to have it tell him he can get it for you from any wholesale druggists or it will be sent to you to any part of the United States or Canada upon the receipt of fifty cents in stamps by addressing the

Clark Stanley Snake Oil Liniment Co.

PROVIDENCE, R. I.

Snake Oil[1] Benefits

It will take strokes off your code while increasing clarity.

[1]: No pythons were harmed in the making of this talk.

What are Strokes?

+1: keywords, variable names, each operator (including square brackets)

+0: whitespace, dots, commas, parentheses, quotes, colons, and closing braces/brackets

Effectively counting units of information present.

Why even?

```
>>> import this
The Zen of Python, by Tim Peters (abridged)

Beautiful is better than ugly.
Simple is better than complex.
If the implementation is easy to explain, it may be a
good idea.
```

Ever written code like this?

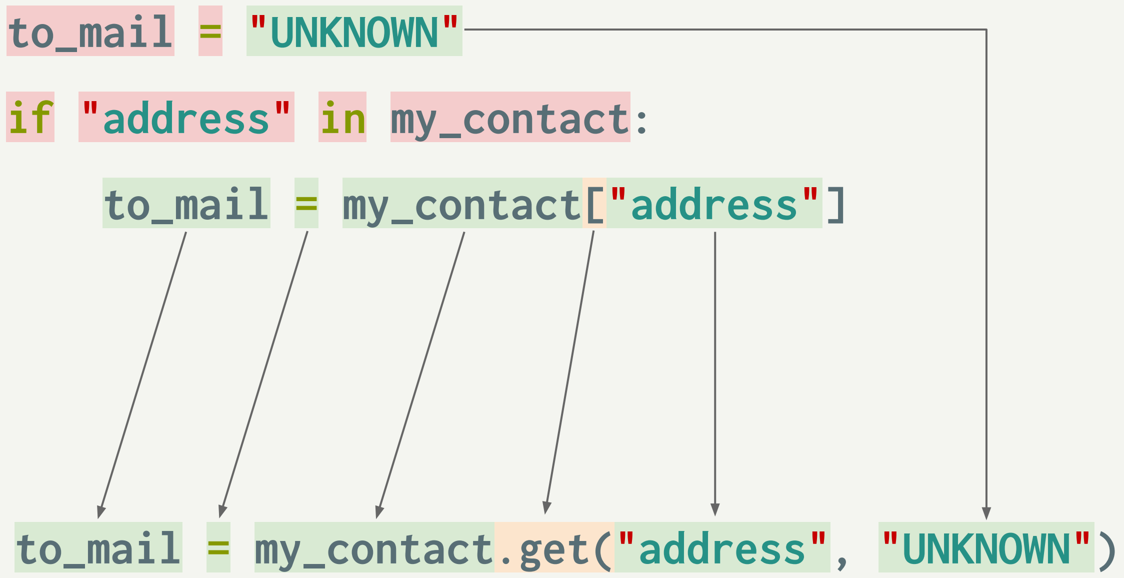
```
to_mail = "UNKNOWN"
if "address" in my_contact:
    to_mail = my_contact["address"]


# Try using a default
to_mail = my_contact.get("address", "UNKNOWN")
```

Counting up the strokes

to_mail^{1} =^{2} "UNKNOWN^{3}"
if^{4} "address^{5}" in^{6} my_contact^{7}:
    to_mail^{8} =^{9} my_contact^{10}[^{11}"address^{12}"] # 12 strokes

# Try using a default
to_mail^{1} =^{2} my_contact^{3}.get^{4}("address^{5}", "UNKNOWN^{6}") # 6 strokes

Visual Diff



```python
to_mail = "UNKNOWN"
if "address" in my_contact:
    to_mail = my_contact["address"]
```

```python
to_mail = my_contact.get("address", "UNKNOWN")
```

```python
# strokes -= 6
```

Initializing dict values

```python
counts = {}
if item not in counts:
    counts[item] = 0
counts[item] += 1

# If only there were a better way!
```

Initializing dict values

```
counts = {}
if item not in counts:
    counts[item] = 0
counts[item] += 1  # 18 strokes

# Why not defaultdict?
from collections import defaultdict  # 4 extra strokes per file

counts = defaultdict(int)
counts[item] += 1  # 13 strokes (including overhead)
```

Cleaning Up Resources

```
infile = open('myfile.txt', 'r')
for line in infile:
    print(line)
infile.close()

# Why bother explicitly cleaning up?
```

Context Managers

```python
infile = open('myfile.txt', 'r')
for line in infile:
    print(line)
infile.close()  # 13 strokes

# Let’s do this automagically
with open('myfile.txt', 'r') as infile:
    for line in infile:
        print(line)  # 12 strokes
```

Exception Handling

```
try:
    infile = open('myfile.txt', 'r')
    raise Exception()
finally:
    infile.close()  # 12 strokes

# try-finally already baked in by default!
with open('myfile.txt', 'r') as infile:
    raise Exception()  # 9 strokes
```

“Simple” implementation

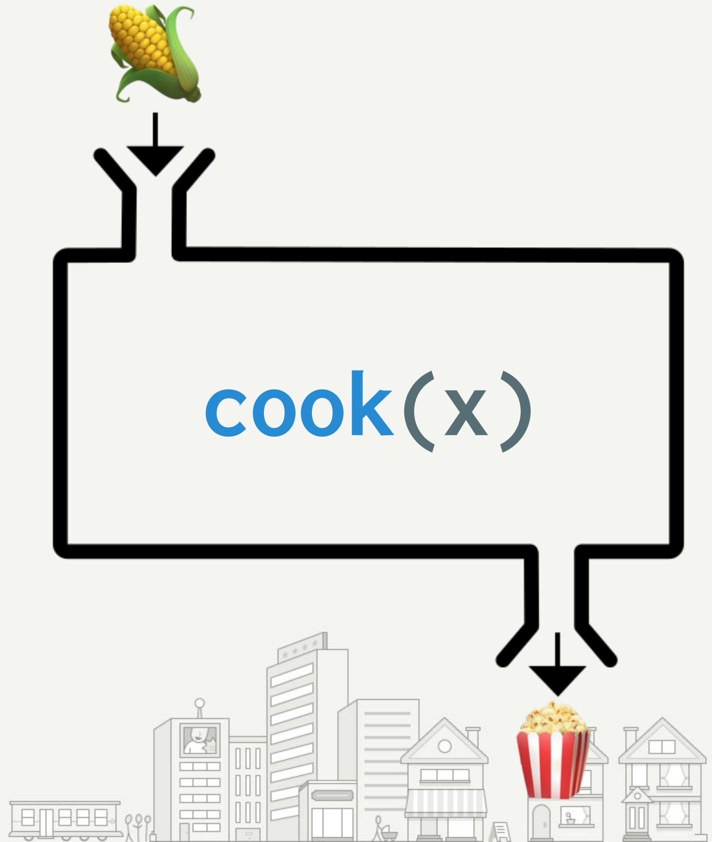
```
# To implement make any class into a context manager, “simply” implement
# the __enter__ and __exit__ methods:
class Tag():
    """Poorly adds html tags"""
    def __init__(self, name):
        self.name = name
    def __enter__(self):
        print("<%s>" % self.name)
    def __exit__(self, *args):
        print("</%s>" % self.name)
# Too much boilerplate, we can do better!
```

Let’s decorate with @contextmanager

```
from contextlib import contextmanager
@contextmanager
def tag(name):
    """Poorly adds html tags"""
    print("<%s>" % name)
    yield # Do the actual work here
    print("</%s>" % name)

# With enough space to spare, here’s an example:
with tag("h1"):
   print("foo")
```

Functions aren’t scary

```
def cook(food):
    return 🍿
cook(🌽) => 🍿

# Lambdas are just functions:
lambda food: 🍿
```



Quick Functions Primer

```
map([🌽, 🐮, 🥚], cook)
=> [🍿, 🍔, 🍳]

filter([🍿, 🍔, 🍳], isVegetarian)
=> [🍿, 🍳]

reduce([🍿, 🍳], eat)
=> 💩
```

Stolen from a tweet from @steveluscher

Goofus and Gallant

Goofus runs with the scissors pointing up.

Gallant walks with the scissors pointing down.

Goofus and Gallant explore functions

Goofus thinks iteratively, focusing on how to compute the result.
Goofus has mastered **looping over data** to compute results.

Gallant thinks functionally, focusing on what the result is.
Gallant has mastered **composing functions** to compute results.

Goofus and Gallant explore map

Goofus iterates over nums, appending doubles of values:

```
double_nums = []
for n in nums:
    double_nums.append(n * 2)
# 12 strokes
```

Gallant uses map to compute doubles:

```
double_nums = list(map(lambda x: x * 2, nums))
# 10 strokes
```

Goofus and Gallant explore reduce

Goofus iterates over nums, adding to the total:

```
total = 0
for n in nums:
    total += n
# 10 strokes
```

Gallant uses a reducer:

```
total = reduce(lambda x, y: x + y, nums)
# 10 strokes
```

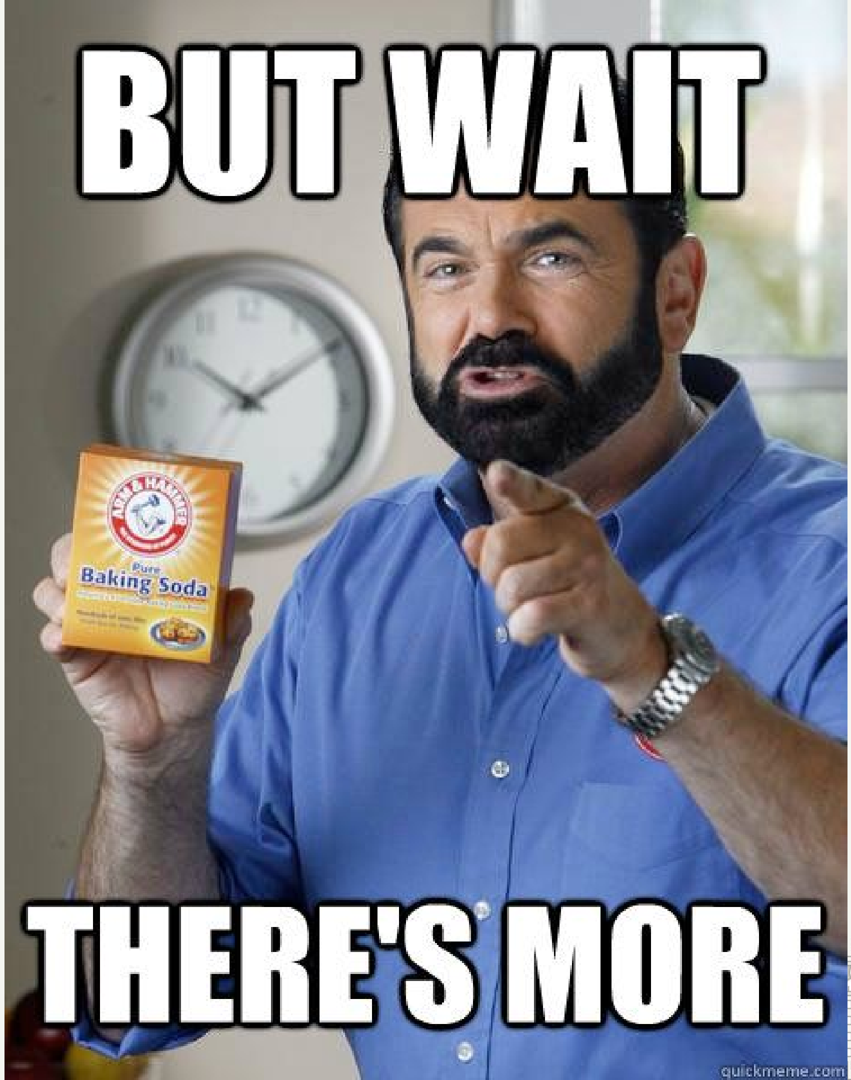
Goofus and Gallant explore filters

Goofus iterates over nums, appending only evens:

```
only_evens = []
for n in nums:
    if n % 2 == 0:
        only_evens.append(n)
# 16 strokes
```

Gallant filters nums for evens:

```
only_evens = list(filter(lambda x: x % 2 == 0, nums))
# 12 strokes
```


BUT WAIT
THERE'S MORE
Baking Soda
quickmeme.com

Comprehending Comprehensions

Comprehensions are a more natural way to construct lists (and dicts).

```
result = []
for item in things:
    if condition(item):
        result.append(transform(item))
# 14 strokes

result = [ transform(item) for item in things if condition(item) ]
# 12 strokes
```

Comprehensions Deconstructed

```
result = []
for item in things:
    if condition(item):
        result.append(transform(item))
```

```
result = [ transform(item) for item in things if condition(item) ]
# strokes -= 2
```

Better Mapping with Comprehensions

Gallant uses map to produce doubles:

```
double_nums = list(map(lambda x: x * 2, nums))
# 10 strokes
```

Billy Mays uses a comprehension:

```
double_nums = [ x * 2 for x in nums ]
# 10 strokes
```

Better Filtering with Comprehensions

Gallant filters nums for evens:

```
only_evens = list(filter(lambda x: x % 2 == 0, nums))
# 12 strokes
```

Billy Mays uses a comprehension:

```
only_evens = [ x for x in nums if x % 2 == 0 ]
# 14 strokes
```

Better Reduces with ~~Comprehensions~~

Gallant uses a reducer:

```
total = reduce(lambda x, y: x+y, l)
# 10 strokes
```

Shamwow guy uses the sum function:

```
total = sum(nums)
# 4 strokes
```

Better dicts with Comprehensions

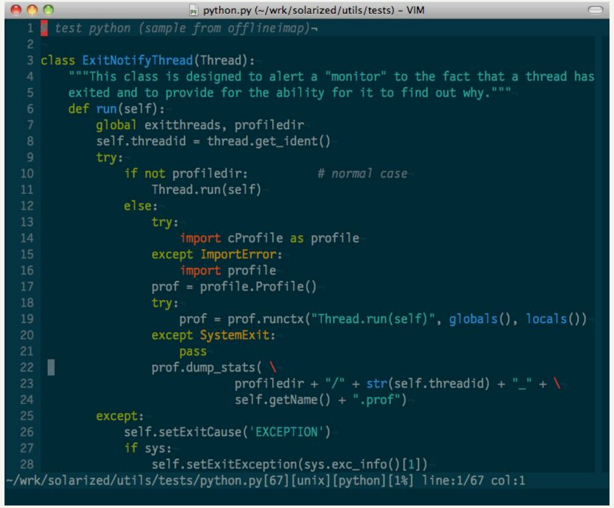
Goofus iterates, as that’s what he knows:

```
num_to_letters = {}
for x in range(0, 26):
  num_to_letters[x] = chr(97 + x)
# 17 strokes
```

Billy Mays uses a comprehension:

```
num_to_letters = {x: chr(97 + x) for x in range(0, 26)}
# 14 strokes
```

Where can conciseness help?



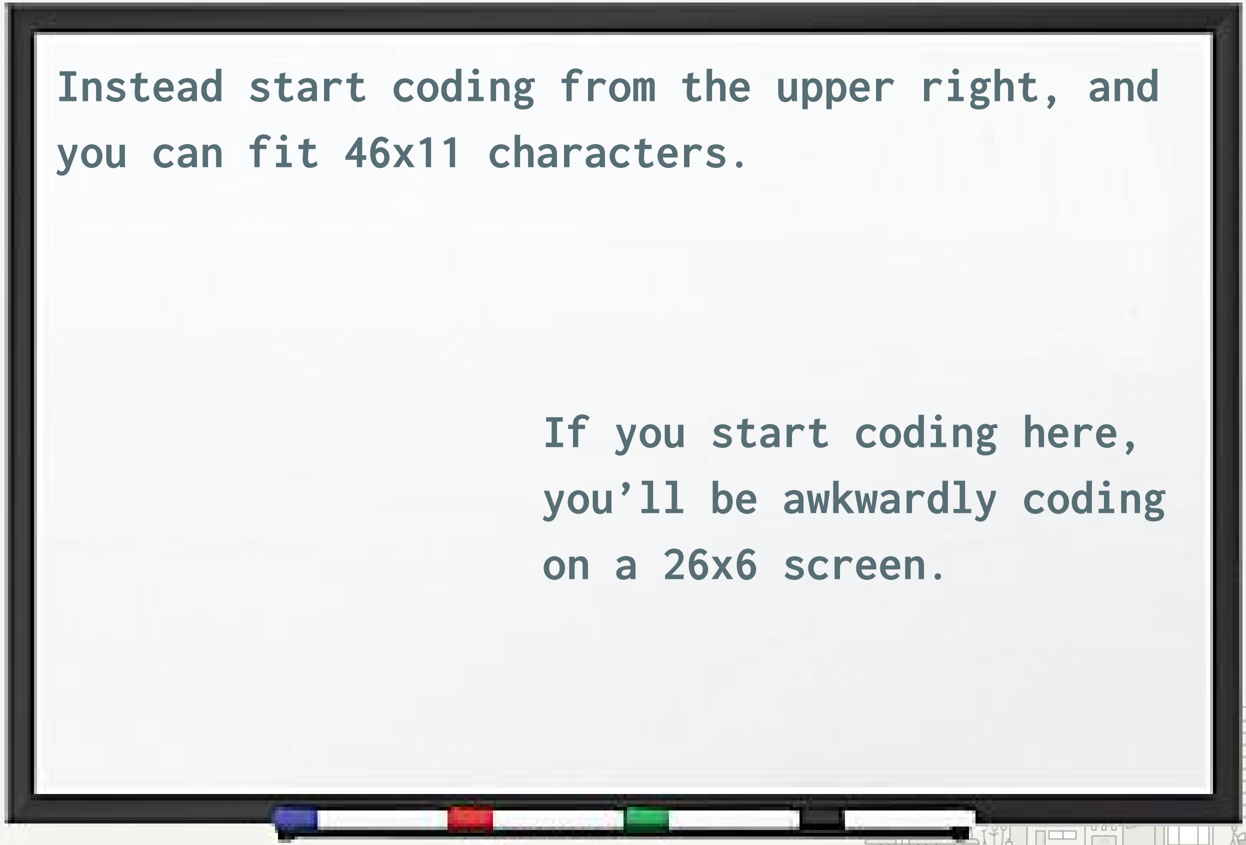
```
# test python (sample from offlineimap)¬

class ExitNotifyThread(Thread):
    """This class is designed to alert a "monitor" to the fact that a thread has
    exited and to provide for the ability for it to find out why."""
    def run(self):
        global exitthreads, profiledir
        self.threadid = thread.get_ident()
        try:
            if not profiledir:          # normal case
                Thread.run(self)
            else:
                try:
                    import cProfile as profile
                except ImportError:
                    import profile
                prof = profile.Profile()
                try:
                    prof = prof.runctx("Thread.run(self)", globals(), locals())
                except SystemExit:
                    pass
                prof.dump_stats( \
                            profiledir + "/" + str(self.threadid) + "_" + \
                            self.getName() + ".prof")
        except:
            self.setExitCause('EXCEPTION')
            if sys:
                self.setExitException(sys.exc_info()[1])
~/wrk/solarized/utils/tests/python.py[67][unix][python][1%] line:1/67 col:1
```

slides

screens

whiteboards

Quick Whiteboarding Tip



Instead start coding from the upper right, and you can fit 46x11 characters.

If you start coding here, you’ll be awkwardly coding on a 26x6 screen.

Final Takeaways

- Stroke reduction (making code more concise) reduces the cognitive load to understand code.

- Python enables doing more with less.

- For common operations, there’s probably already a builtin or library.

“Je n'ai fait celle-ci plus longue que parce que je n'ai pas eu le loisir de la faire plus courte.”

"I apologize for the length of this presentation, but I didn't have time to make it shorter."

- @BlaisePascal

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talk.exit(“That’s all folks!”)