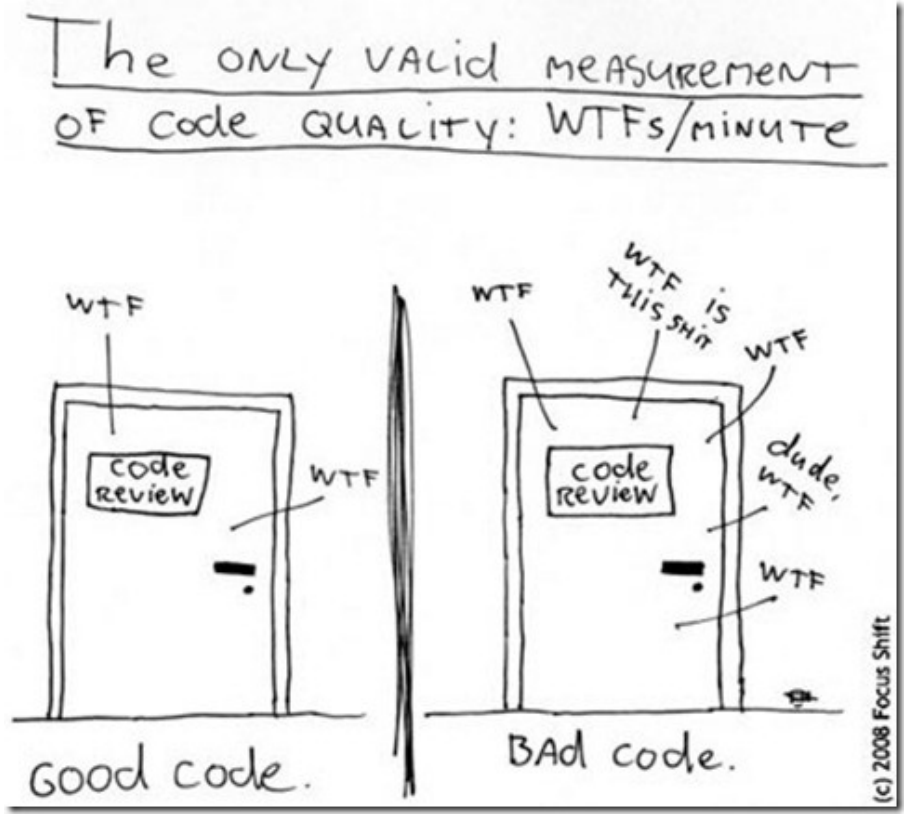
Aspects of good quality code

In the next part, you will review your code for

- Readability
- Reusability
- Robustness

Get your code ready!



I. Code readability

Who is the audience that will read your code?

> Code is for computer, comments are for humans.

Who agrees with this statement?

Code readability

- ~~Code is for computer, comments are for humans.~~
- Use whitespace and newlines strategically.

Compare:

```
if foo == 'blah': do_blah_thing()
do_one(); do_two(); do_three()
```

with

```
if foo == 'blah':
    do_blah_thing()

do_one()
do_two()
do_three()
```

Compound statements are generally discouraged, make generous use of newlines

Code readability

- ~~Code is for computer, comments are for humans.~~
- Use whitespace and newlines strategically.
- use descriptive names for functions and variables
    - start functions with a verb
    - make variable names *just* long enough to be meaningful

Code readability

Compare

```
for i in my_shopping_basket:
  if(test(i)) > 10:
    purch(i)
  else:
    disc(i)
```

Code readability

Compare

```
for i in my_shopping_basket:
  if(test(i)) > 10:
    purch(i)
  else:
    disc(i)
```

with

```
for item in basket:
  if(testNecessity(item)) > 10:
    purchase(item)
  else:
    discard(item)
```

Code readability

- ~~Code is for computer, comments are for humans.~~
- Use whitespace and newlines strategically.
- use descriptive names for functions and variables
    - start functions with a verb
    - make variable names *just* long enough to be meaningful
- use a consistent style
    - consistency will make your code easier to understand and maintain
    - consult a styleguide for your language (keep conventions, and don't reinvent the wheel)

Variable naming

Compare:

```
myVar = original_variable + MOD(new.var)
```

with

```
my_var = original_var + Modified(new_var)
```

consistency is key!

Comments

- Comments that contradict the code are worse than no comments. Always make a priority of keeping the comments up-to-date when the code changes!
- Ensure that your comments are clear and easily understandable to other speakers of the language you are writing in (ENGLISH!)
- Delete commented code
- Inline comments are unnecessary and in fact distracting if they state the obvious.

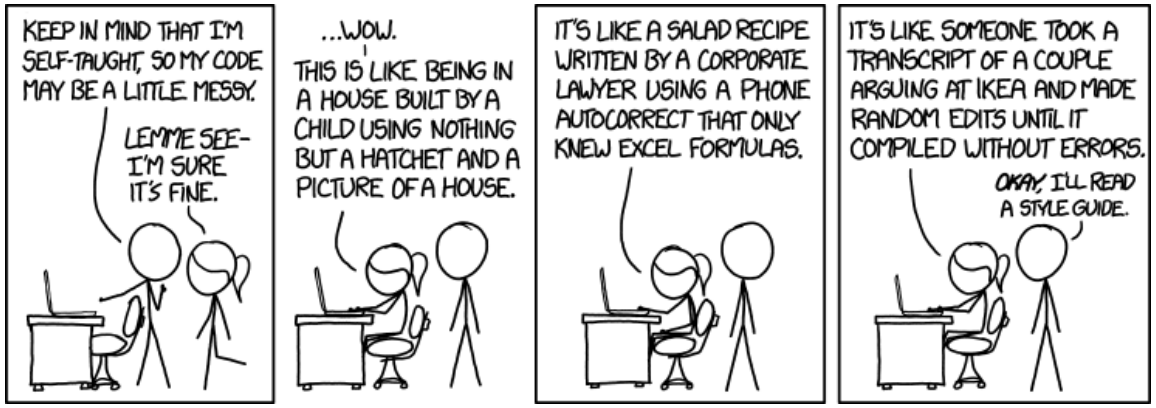
Don’t do this

```
x = x + 1                 # Increment x
```

This is more useful

```
x = x + 1                 # Compensate for border
```

Styleguides



- Python style manual: PEP-8
- MATLAB style guide: MATLAB File-exchange
- Custom: PVMD Toolbox

Are you already following a style guide?

Would it make sense to adopt a style guide for the group?

Your turn

Where can you improve the readability of your code?

- Run a linter (e.g. `flake8` for Python, `checkcode` for MATLAB, or `lintr` for R) to identify conflicts with style guides.
- If you find code that is hard to read, make a note to work on it.
  (Schedule time to refactor, but do not do this now!)

Tip! Use `%TODO` *or* `#TODO` *(depending on your comment marker) to easily find these spots later on. Many IDEs can extract these into a task list (including MATLAB)!*

Were you able to improve readability?

- Naming conventions
- Comments
- Formatting
- Compound statements