Things I wished_I Kn-EW (when) I Started coDing… (with Matlab)

Marburg
February 2023

Remi Gau

CC BY NC

Goals

- Improving code quality
- Gain confidence in your code
- Learn transferable skills
  - Across coding languages
  - Valuable outside of academia

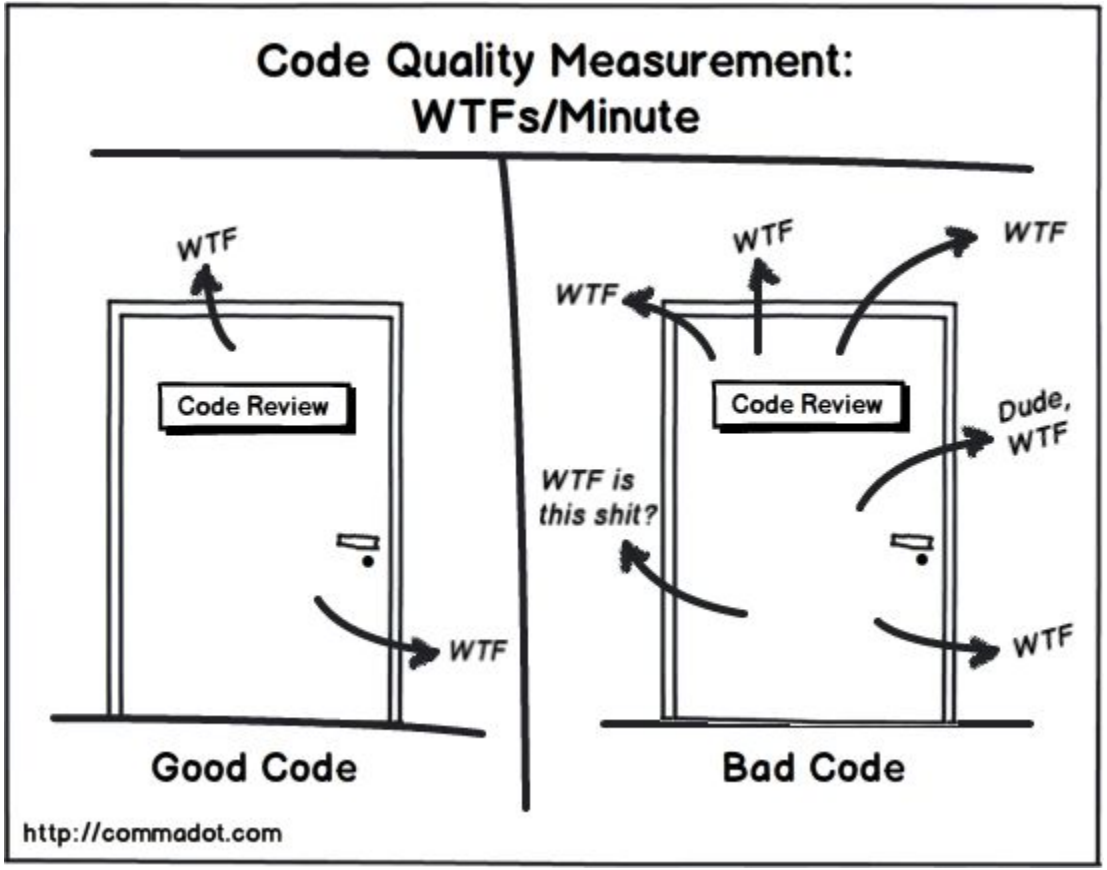
Menu

- Testing code
- Formatting code
- Refactoring code
- Self-discipline
- ~~Self-discipline~~ Automation
- BONUS: Structuring projects

Format

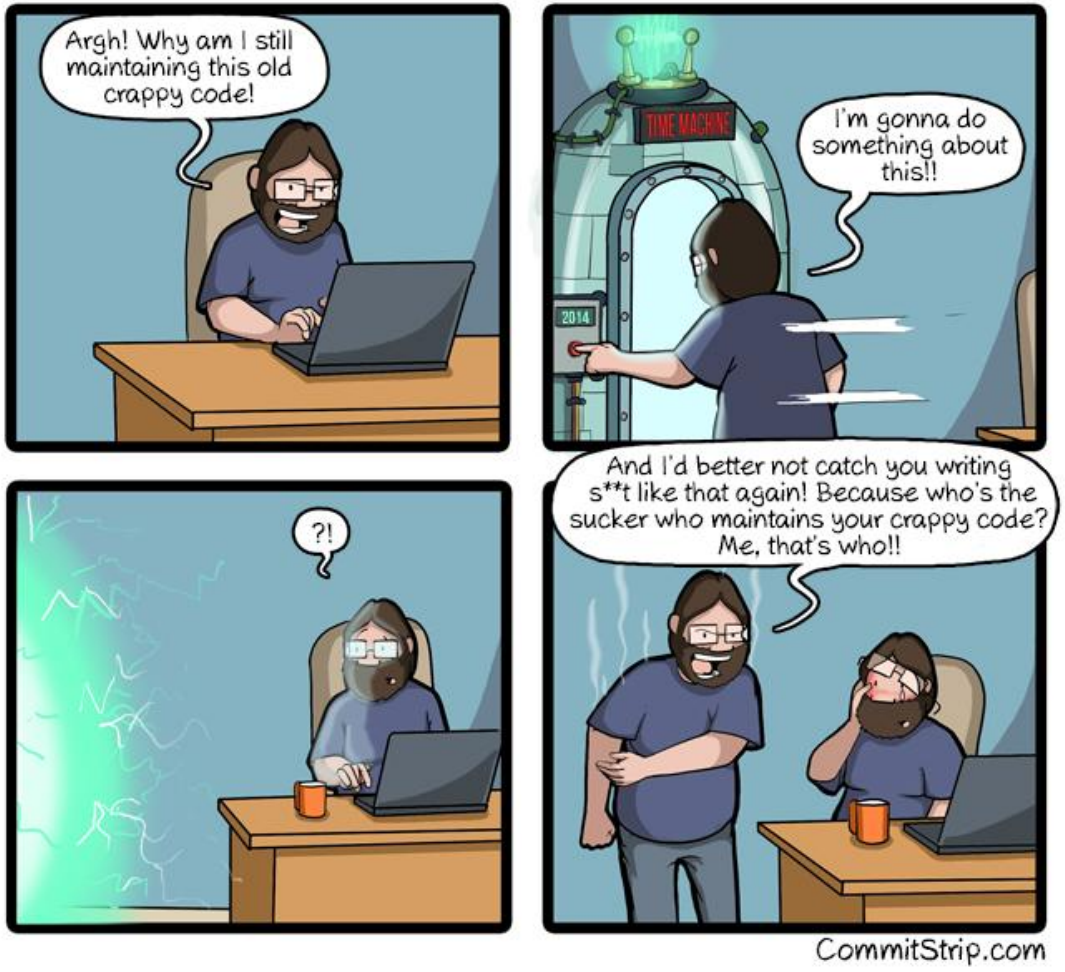
- Me
  - Live demo
  - Live code review / cleaning
- You
  - Try it on your own code (or on provided code)

Format


Code Quality Measurement:
WTFs/Minute
WTF
Code Review
WTF
Good Code
WTF
WTF
WTF
WTF
Code Review
Dude,
WTF
WTF is
this shit?
WTF
Bad Code
http://commadot.com

- Whose code?
  - Mine

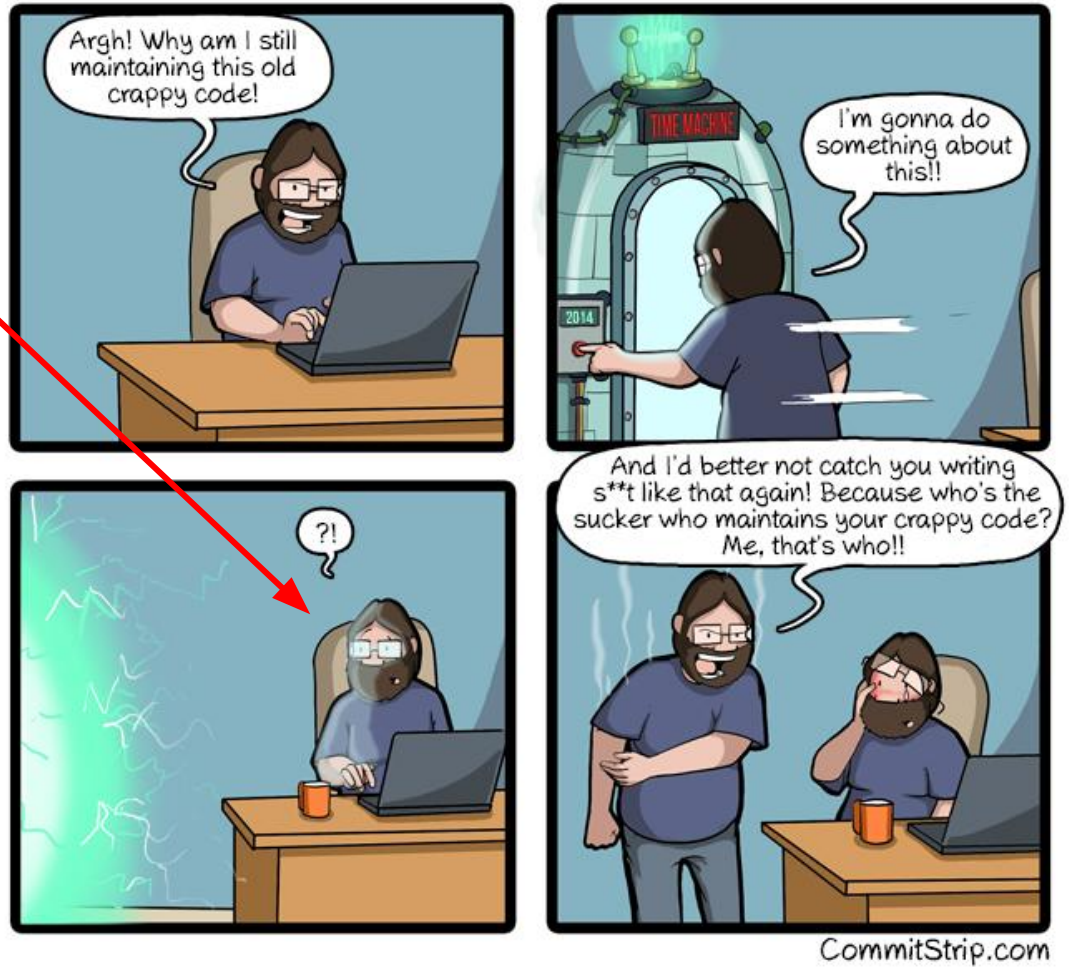
- Whose code?
  - Mine



https://www.commitstrip.com/en/

- Whose code?
  - Mine

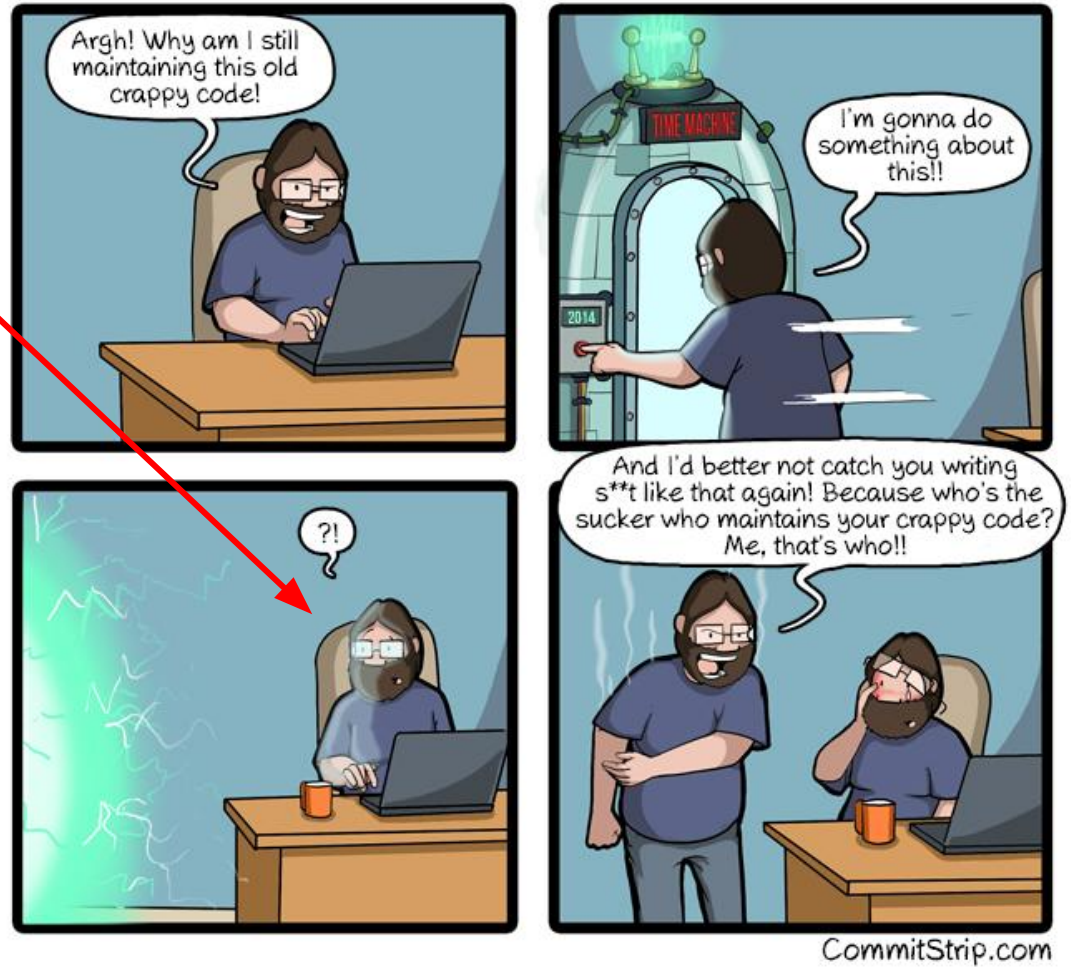
Me in 2012.
I know about if
and for loop



https://www.commitstrip.com/en/

Me in 2012.
I know about if
and for loop

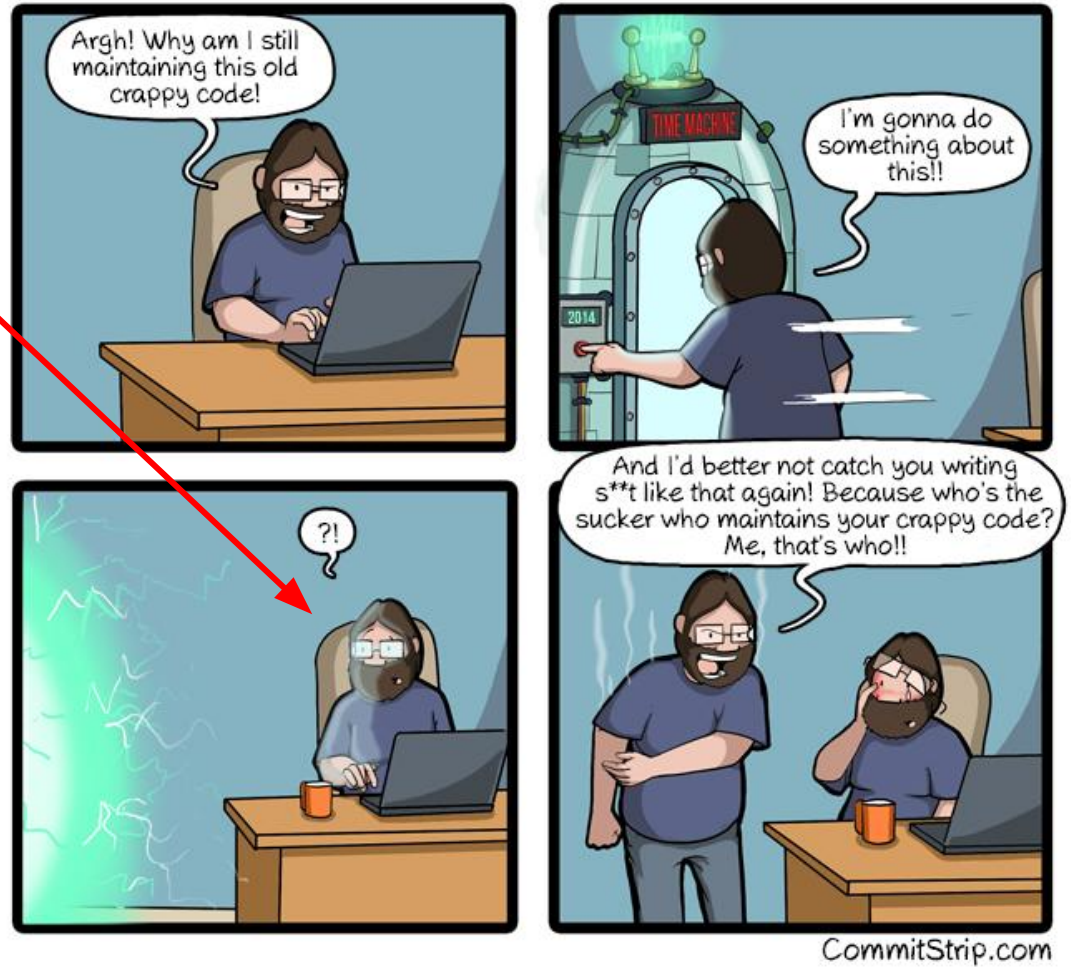
- Whose code?
  - Mine
- Why?
  - We all have dirty code.
  - Can still be shared.
  - Can be improved.



https://www.commitstrip.com/en/

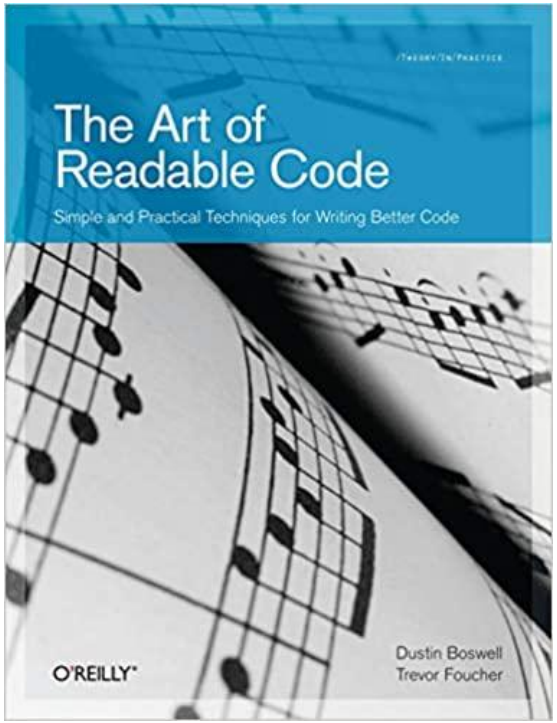
Me in 2012.
I know about if
and for loop

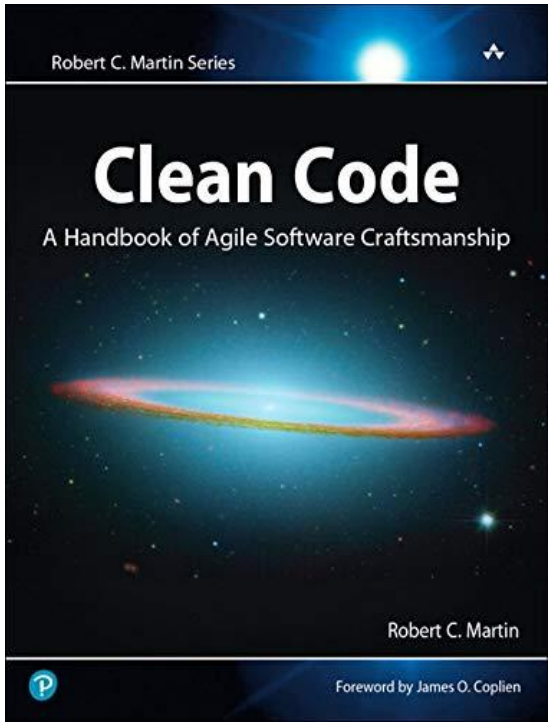
- Whose code?
  - Mine
- Why?
  - We all have dirty code.
  - Can still be shared.
  - Can be improved.
- Why live demo?
  - We all google stuff.



https://www.commitstrip.com/en/

References





More references: https://remi-gau.github.io/matlab_clean_code_workshop/references/

Testing

Questions

- Who has
  - code on github / gitlab?
  - code on github / gitlab in a public repository?
  - shared the code for one of their paper, thesis?
- Who has told themselves “I need to clean my code”... and never done it?

Why test?

"*If I change my (or someone's) code, I will mess something up / add a bug.*

- *I will break the code.*
- *Or worse: it will still run but it will not give me the same results.*"

Testing: why?

"*If I change my (or someone's) code, I will mess something up / add a bug.*

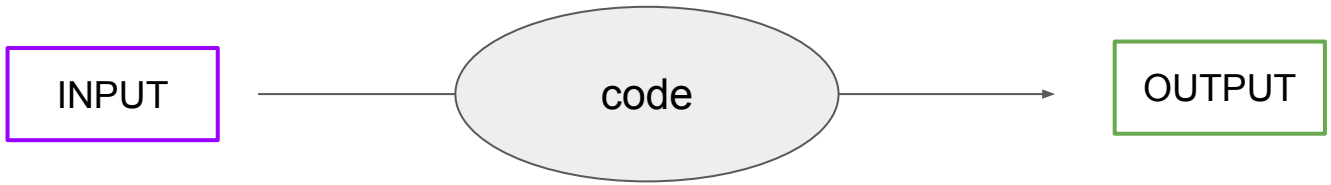
- *I will break the code.*
- *Or worse: it will still run but it will not give me the same results.*"

Solution:

- Use Git
- Write tests

Testing: why?

- Tests define the behavior of your code



Testing

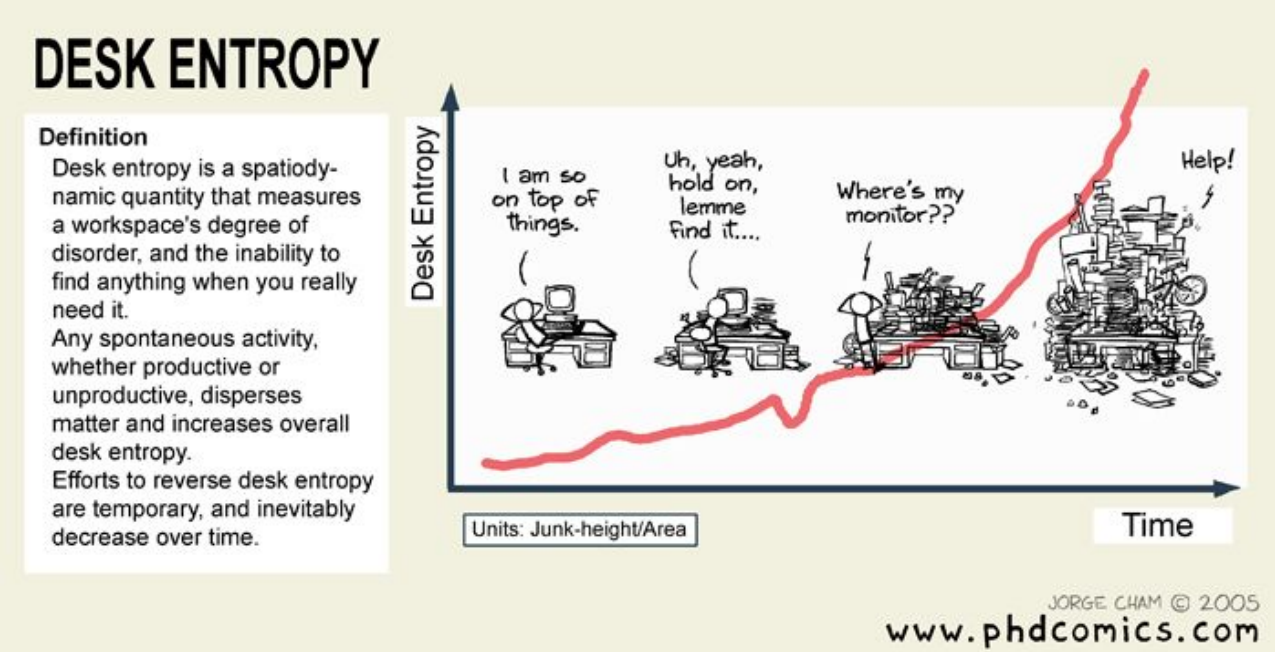
https://remi-gau.github.io/matlab_clean_code_workshop/testing/testing/

Formatting

Questions

- How often do you…
  - … brush your teeth? Only before you go to the dentist?
  - … clean your code? Only before you submit a paper?

Formatting: why?

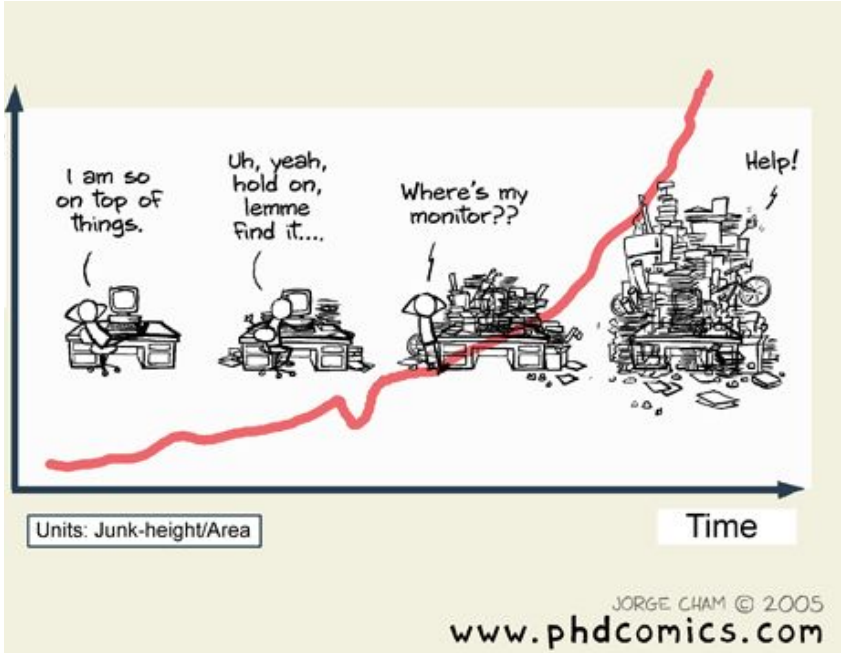


PhD (comics)

Formatting: why?

Technical debt

"*implied cost of additional rework caused by choosing an easy (limited) solution now instead of using a better approach that would take longer.*"



PhD (comics)

Formatting: how?

The scout rule

"*Always leave the code better than you found it.*"

Formatting

https://remi-gau.github.io/matlab_clean_code_workshop/formatting/

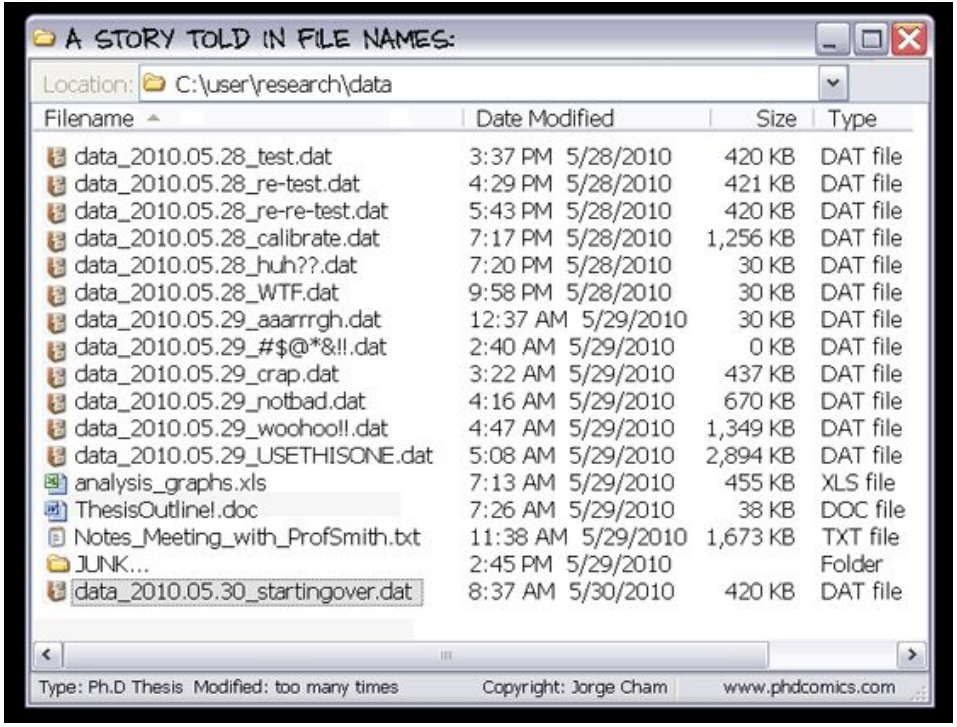
Refactoring

Questions

- Who has copy pasted code?
- Who has written a MATLAB
  - script?
  - function?
- Who has scripts / funcion that are
  - > 500 lines long?
  - > 1000 lines long?
- Who has old code they do not understand?

Technical debt

Fiction



Technical debt

Reality

Link to some old code of mine.

Refactoring

- Refactoring: change the code but not its behavior.

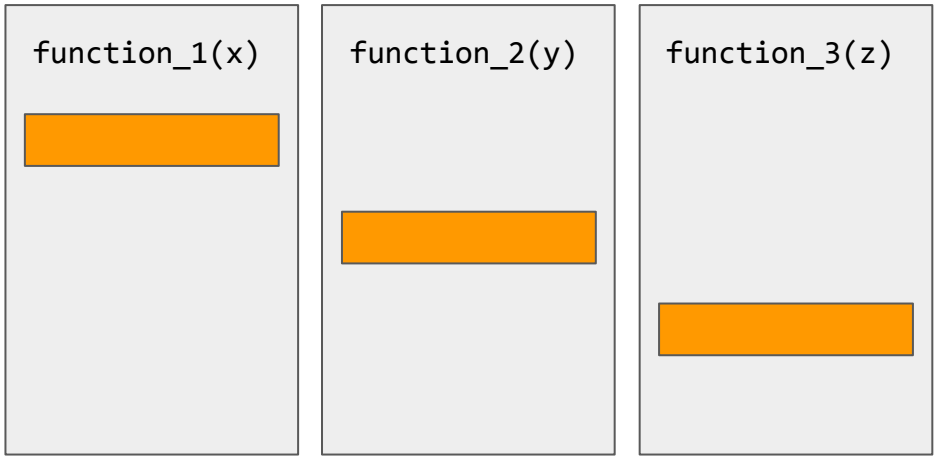
Duplication

Duplication

- Don’t Repeat Yourself (DRY)
- Copy-pasta leads to spaghetti code.

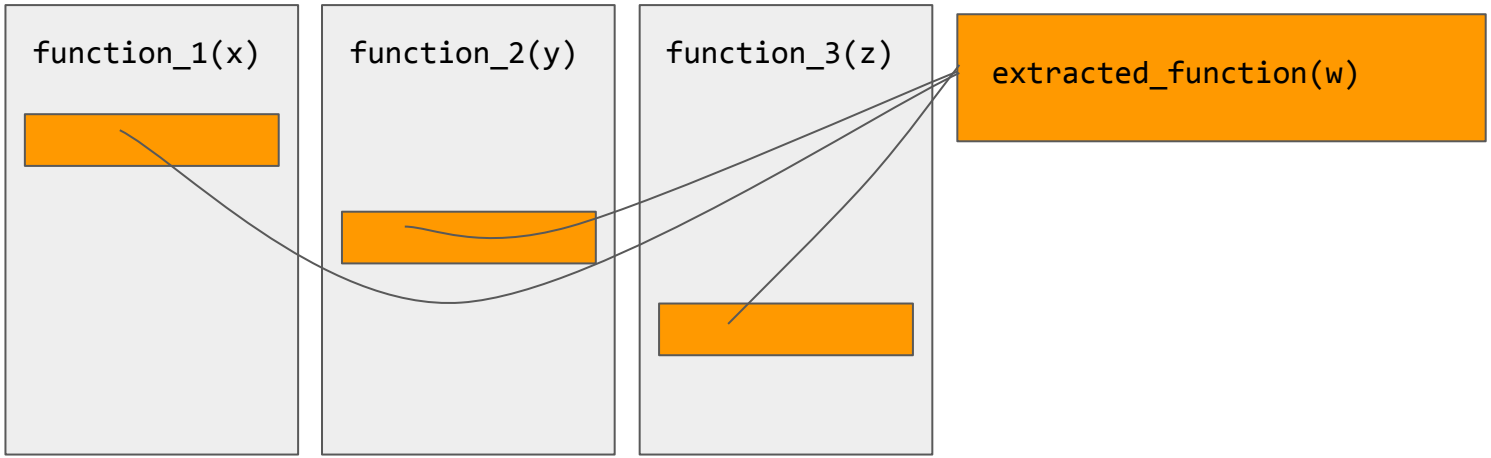
Duplication

- Don’t Repeat Yourself (DRY)
- Copy-pasta leads to spaghetti code.



Duplication

- Don’t Repeat Yourself (DRY)
- Copy-pasta leads to spaghetti code.



Duplication

- Don’t Repeat Yourself (DRY)
- Copy-pasta leads to spaghetti code.

Single responsibility principle

Single responsibility principle

"*A function should only ever do one thing and do it well.*"

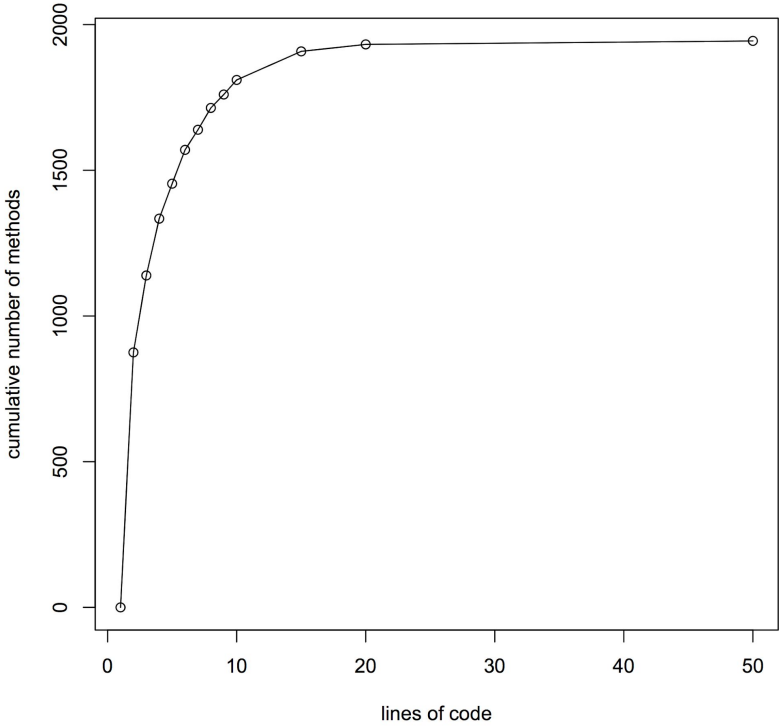
Single responsibility principle

rule of thumb: “function should be shorter than one screen height”

Single responsibility principle

BAD rule of thumb: “function should be shorter than one screen height”

Single responsibility principle



source

Comments

Comments

90% of all code comments:

Comments

90% of all code comments:

Comments

- *Comments are for things that cannot be expressed in code.*
- *Comments which restate code must be deleted.*
- *If the comment says what the code could say,*

  then the code must change to make the comment redundant.

Deep nesting

```
if
elseif
elseif
    switch
        case
                for
                        if
                        end
                end
        case
                while
                        If
                                break
                        elseif
                        else
                        end
                end
  end
end
```

Automation

Structure