



# **Refactor towards Structure**

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Peter Kofler, 'Code Cop'  
@codecopkofler  
[www.code-cop.org](http://www.code-cop.org)



# Peter Kofler

- Ph.D. (Appl. Math.)
- Professional Software Developer for 20+ years
- “fanatic about code quality”
- I help development teams





# Rea Sutter

- Mag. Phil. (Linguistics) & BSc (Comp. Sci)
- Developer
- Educator for 10+ years





# I help development teams with

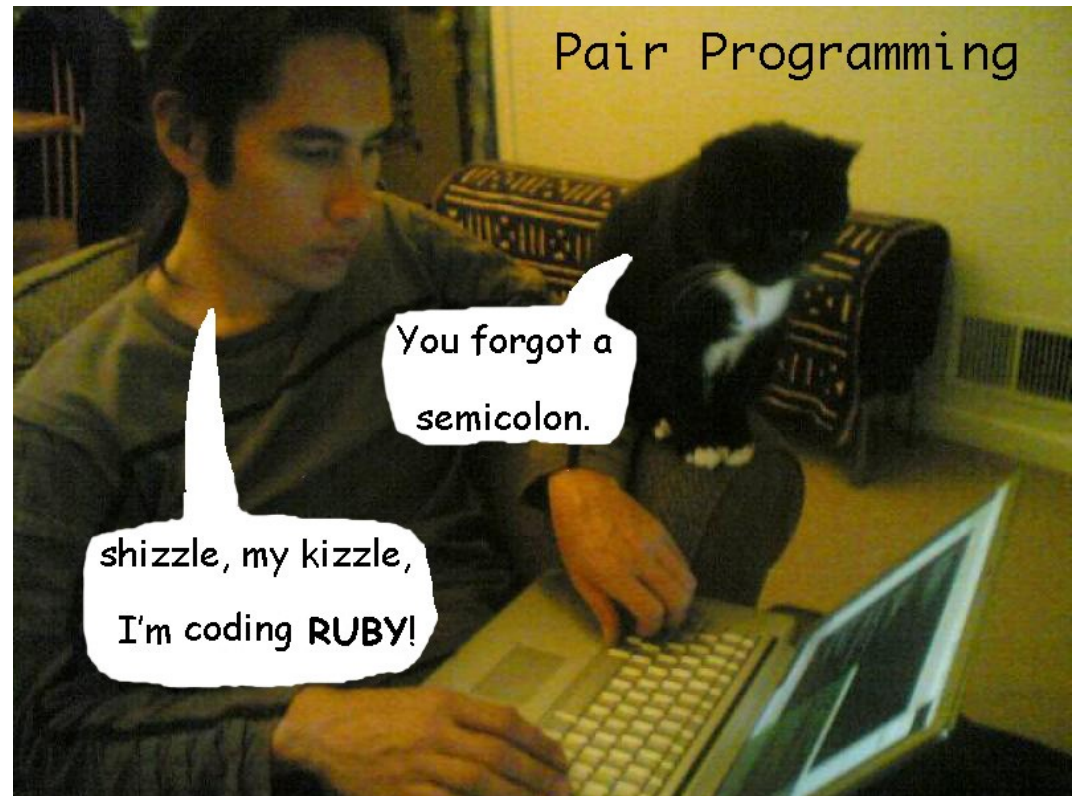
- Professionalism
- Quality and Productivity
- Continuous Improvement





# Mentoring

- Pair Programming
- Programming Workshops
- Deliberate Practice, e.g. Coding Dojos



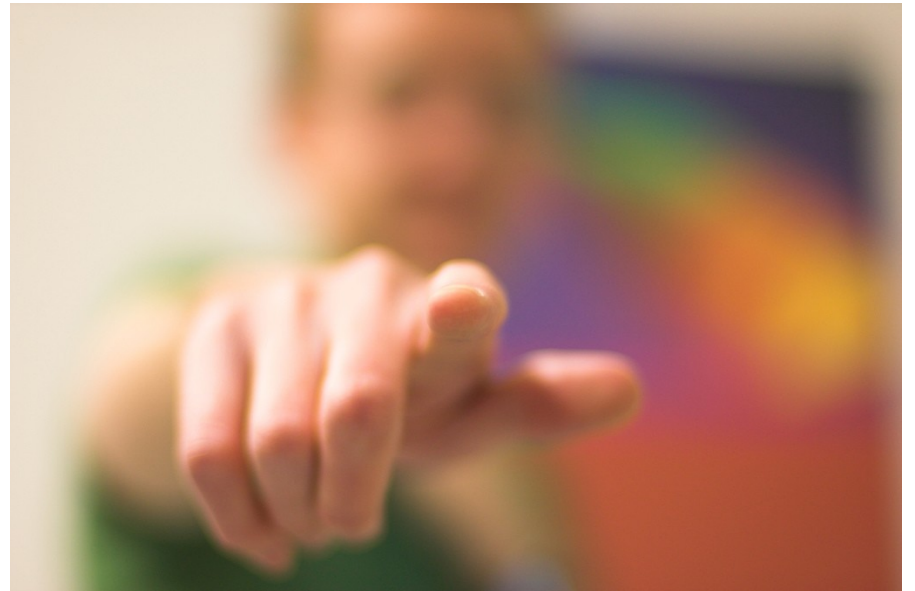


# Developing Quality Software Developers



# What is (Software) Structure?

- What does “structured” mean?
- Which structures do we have?
- Why care?





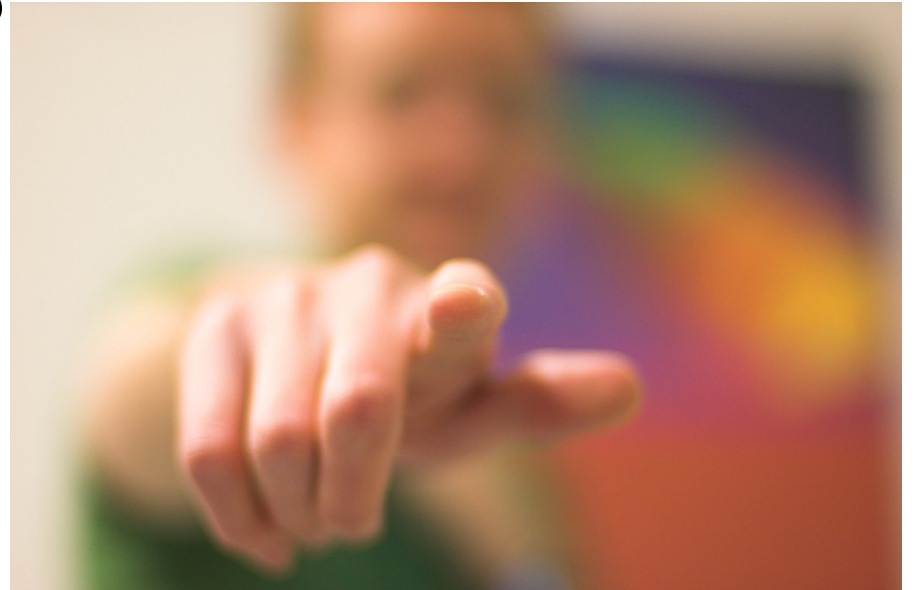
# Types of Modularity

- Structured programming is the low-level code use of structured control flow.
- Object-oriented programming is the use of objects, a kind of data structure.
- Modular programming is the high-level decomposition of the code.
  - e.g. packages, components



# What is Information Hiding?

- What is information hiding and what do we “hide”?
- Why do we want it?





# Information Hiding

- Means restricting direct access to some of the module's components
  - at every level of granularity.
- Usually hide implementation details:
  - e.g. data structure used
  - e.g. algorithm used
  - i.e. HOW we did it (WHAT we did)
- We use “opaque” vs. “transparent”



# Encapsulation

- An object oriented term.
- Objects are defined by what they **do**, not what they contain.
- All data should be hidden within its class.

e.g.

- Tell, Don't Ask (Design Principle).
- All data must be private.
- No Getters/Setters/Properties. (OC#9)



# The Bloaters





# List of Code Smells (Fowler)

## **The Bloaters**

- **Long Method**
- **Large Class**
- **Primitive Obsession (\*)**
- **Long Parameter List (\*)**
- **DataClumps (\*)**

## The Object-Orientation Abusers

- Switch Statements
- Temporary Field
- Refused Bequest
- Alternative Classes with Different Interfaces

## The Change Preventers

- Divergent Change

- Shotgun Surgery
- Parallel Inheritance Hierarchies

## The Dispensables

- Lazy class
- Data class (\*)
- Duplicate Code
- Dead Code
- Speculative Generality

## The Couplers

- Feature Envy
- Inappropriate Intimacy
- Message Chains
- Middle Man



# Hands-on Exercise





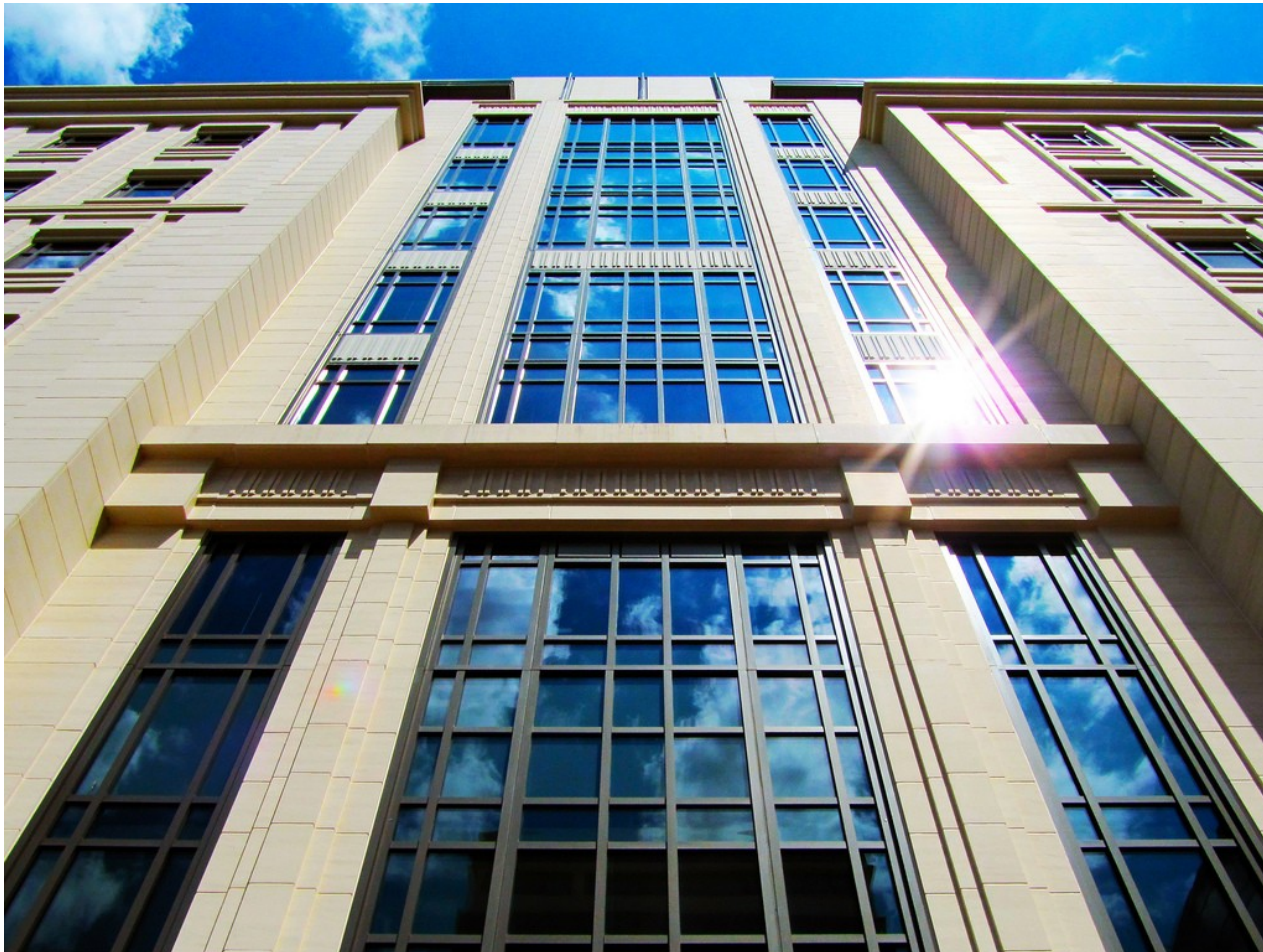
# Coding Dojo Mindset

- Safe place outside work
- We are here to learn
- Need to slow down
- Focus on doing it right
- Collaborative Game





# Assignment: Bank OCR





# Bank OCR Requirements

- You work for a bank, which has a machine to assist in reading letters. The machine scans the paper documents, and produces a file with a number of entries which each look like this:

- Each entry is 4 lines long, each line has 27 characters. The first 3 lines contain an account number written using **pipes and underscores**, and the fourth line is blank. Each account number should have 9 digits, all of which should be in the range 1-9.



# Bank OCR Refactoring Kata

- The OCR program takes this file and parses it into actual account numbers.
- It has tests which cover the logic.
- What is wrong with OCR?
- Refactor the 'parse' method.
- Consider if the input changes.  
E.g. style of digits, number of digits, ...



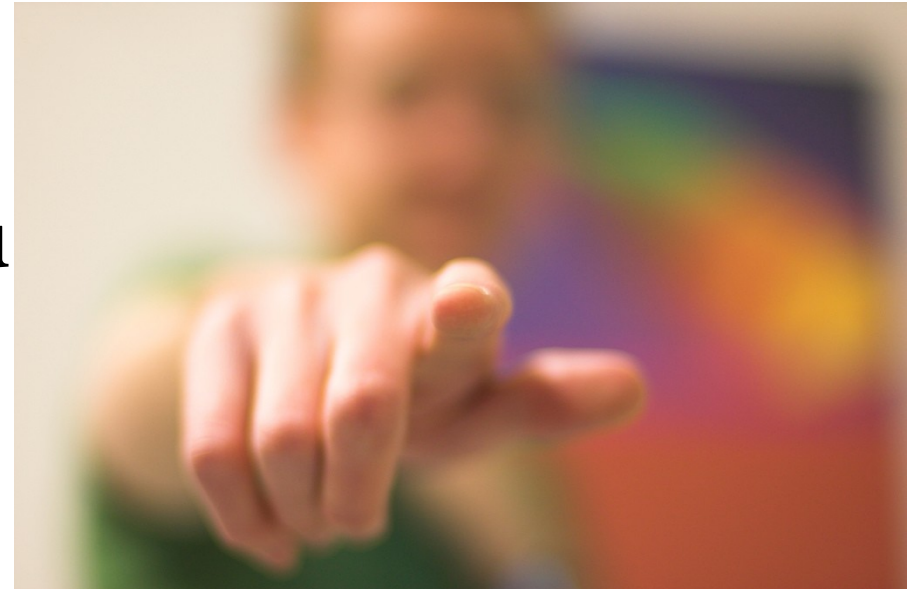
Don't Focus on  
Getting it Done.  
Focus on Doing  
It Perfectly.





# Closing Circle

- Name one thing you learned today?
- Name one thing that surprised you today?
- Name one thing you will do differently in the future?







# Peter Kofler



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