

# Give the aspiring Dev(Sec)Ops a code kata!

What the heck is  
Software Craftsmanship?

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2019-03-12 at [devops-gathering.io](https://devops-gathering.io)  
DevOps Gathering 2019 in Bochum



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# Agenda

Brief History

Current State

Dojo & Katas

**Disclaimer:** Thanks to our fellow crafters!

[@MarcoEmrich](#) / [@DavidVoelkel](#)

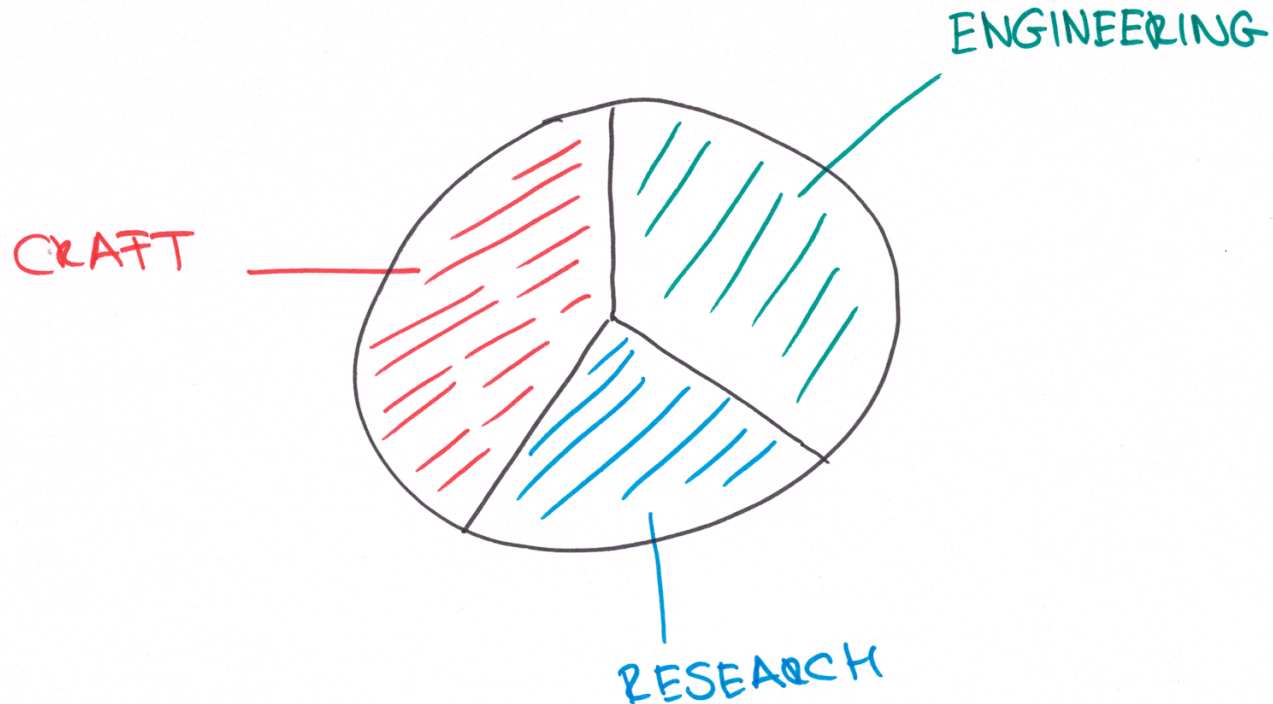




# Brief History



# Software Development

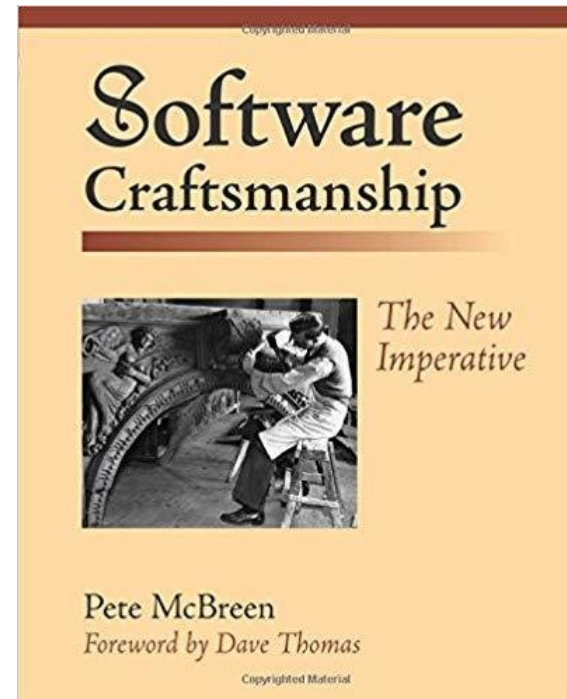
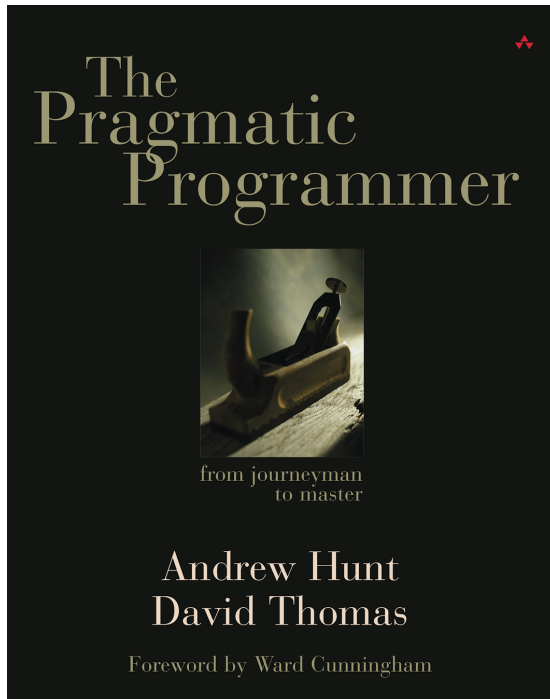


Today we know **software development** is a mixture out of **craft, research and engineering!**

However it was not always like this...



# 1999-2001



- Idea in the 90s: **software factories** for automated software development
- First try: **Engineering as craft!**

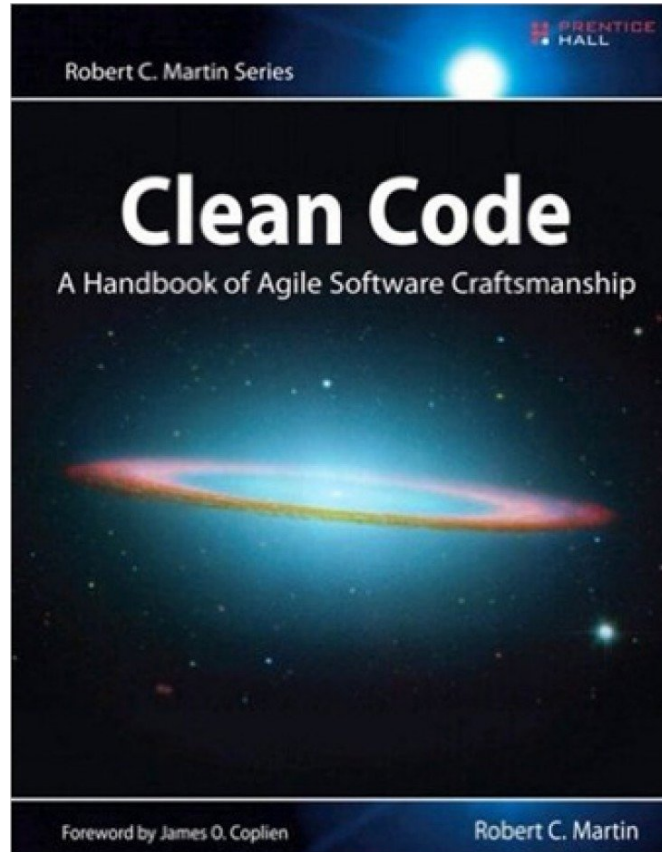
# 2001 - Birth of Agile



- Agile reaches from **Scrum** (project view) to **XP** (technical view)
- Focuses however strongly on **project process!**
- **Technical excellence** largely neglected.



# 2008 - Agile Hangover



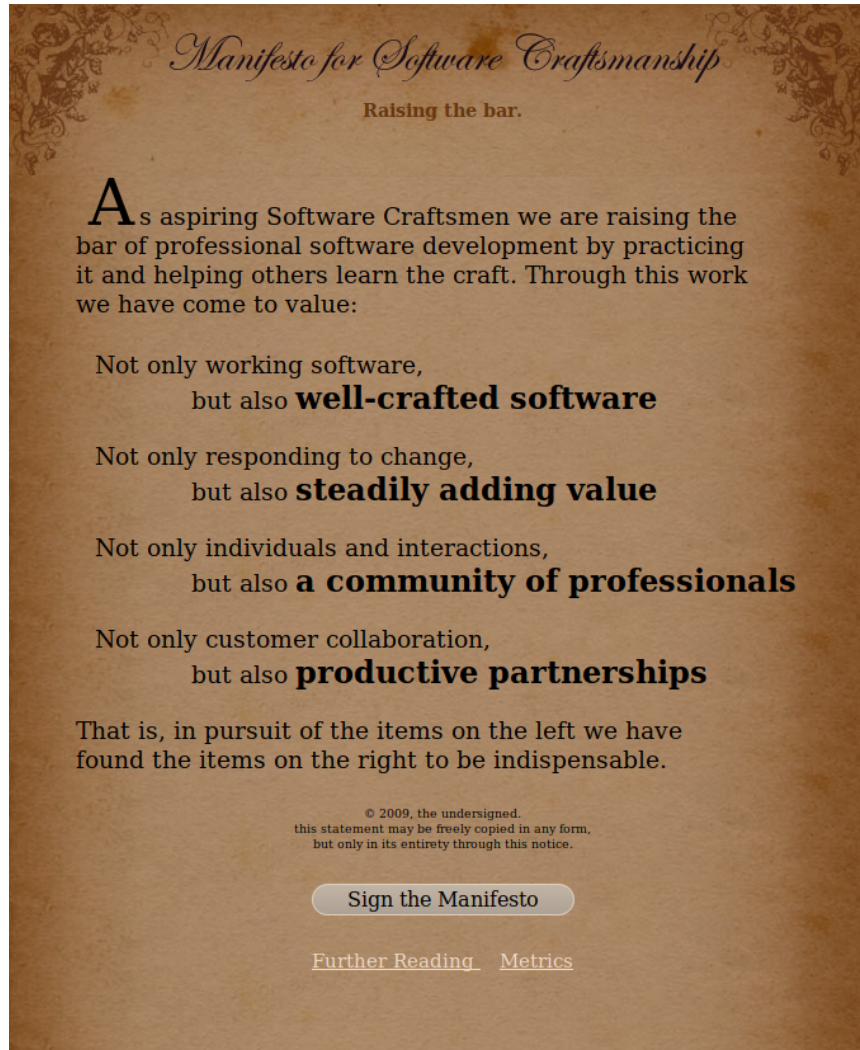
Keynote from Uncle Bob:

- 5 principles to **"craftsmanship over crap"**

...later transformed to:

- **craftsmanship over execution**

# 2009 - Manifesto for SC



2002 - Software Apprenticeship Summit:

- no outcome!

2008 - SC Summit: **Micah Martin** gave a session

- many ideas as outcome
- whiteboard was signed by everyone

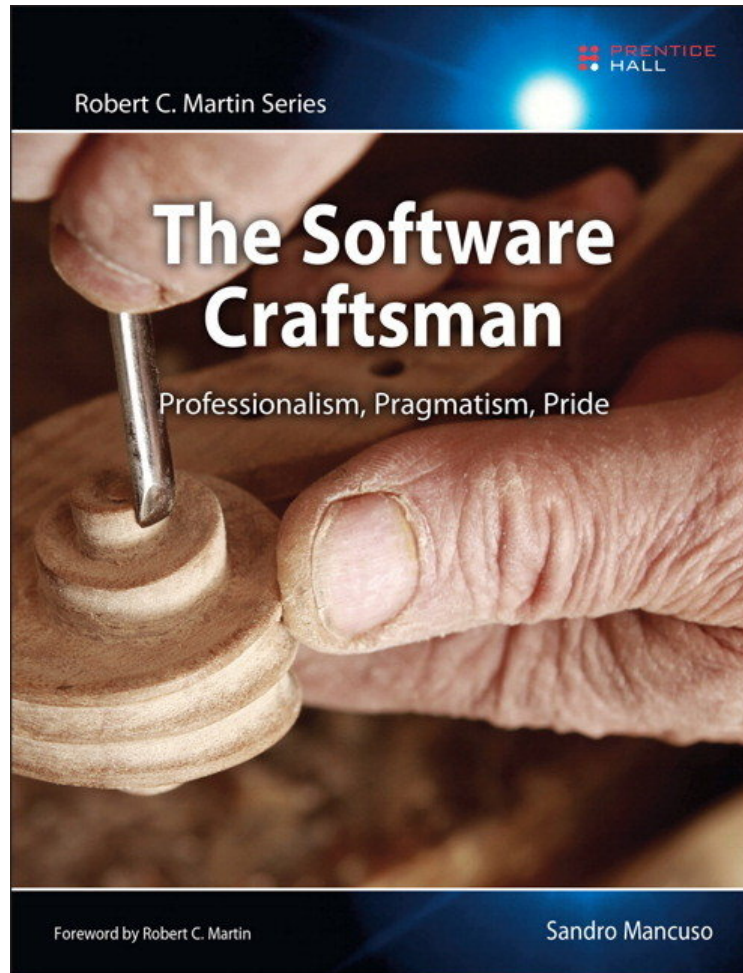
2009 - **Doug Bradburry** wrote in SC Google group "The New Left Side" vs. **Scott Pfister** "Right Side, Revisited"

## Why a manifesto?

1. vocal community
2. create visibility
3. establish principles
4. develop schools
5. guidance for new devs



# 2014 - The Software Craftsman



- Ideology and Attitude
  - History
  - Professionalism
  - Practises
  - ...
- Full Transformation
  - Recruitment
  - Interviews
  - Culture
  - Pragmatism
  - Career

A photograph of a person working at a wooden desk. The person's hands are visible, one holding a pen over a notebook. On the desk are two glasses of iced coffee, a laptop, and a white mug. The scene is lit with warm, natural light. A white rectangular box with the text "Current State" is overlaid on the image.

Current State



# Conferences



2009 - First SC conferences in USA, UK

2009 - Israeli SCC was founded

2010 - London SCC was founded

2011 - First SoCraTes in Germany



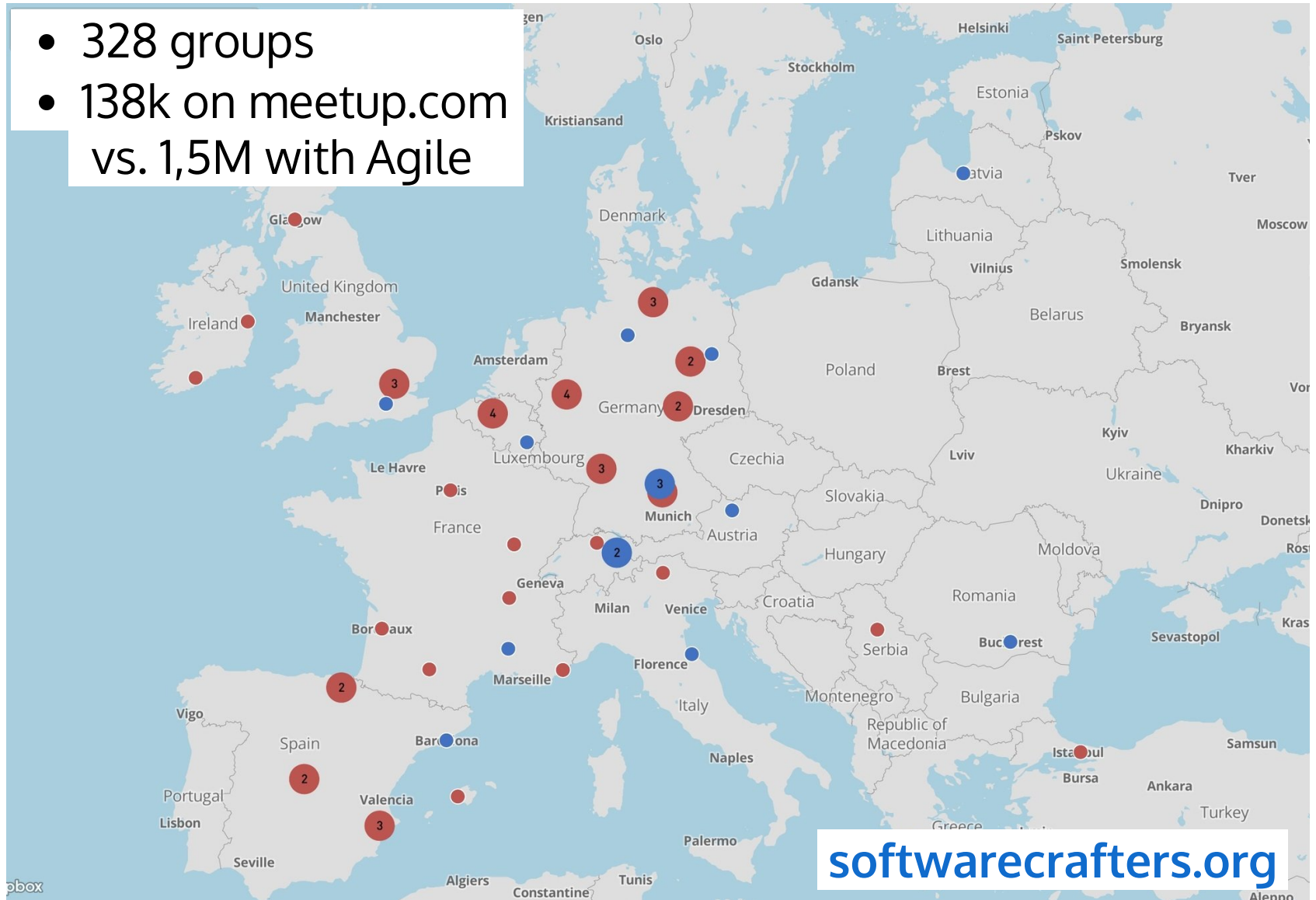
Today - SoCraTes (partner)  
conferences/days in:



**Germany, Chile, Canaries, Italy, UK,  
USA, Switzerland, France, Austria,  
Belgium, Finnland, Romania...**

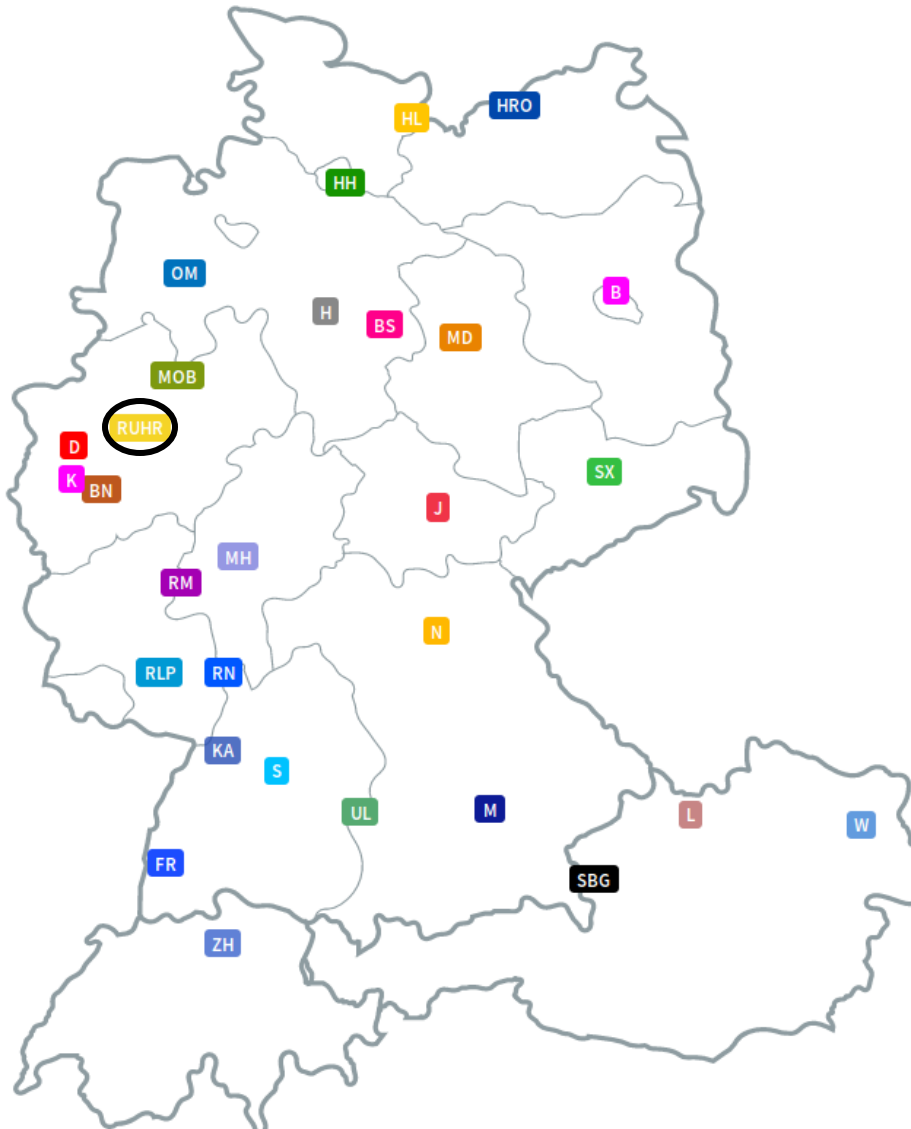
# SCC Communities

- 328 groups
- 138k on meetup.com vs. 1,5M with Agile





# Communities in DACH region



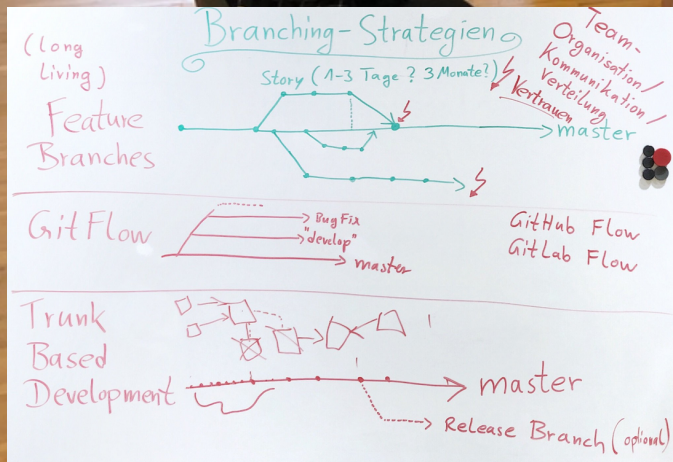
Members:

- 29 regional groups
- 2k on website
- 9k on meetup.com

[softwerkskammer.org](https://softwerkskammer.org)

# Activities

- Open Space
- Birds of Feather (BoF)
- LeanCoffee.org
- Hackergarten.net
- CodeRetreat.org



..but we need to go back to the roots!

- 
- A group of about 15 people, mostly men, are working in a modern office environment. They are seated at long wooden tables, some with laptops open. The room has large windows, a white shelving unit, and a blue exercise ball in the foreground. The atmosphere appears collaborative and focused.
- many new aspiring devs
  - principles got lost again down the road while doing other activities
  - IT market is booming and we **need technical excellence** to tackle our software products
  - arising lack of broad **TDD knowledge**





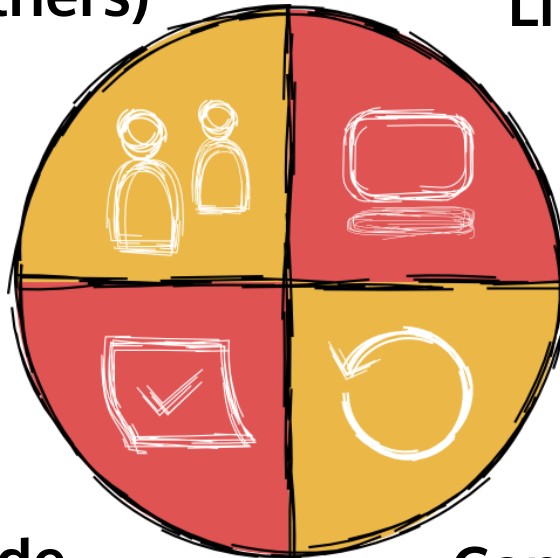


# Craftsmanship Principles

**Individuals & Interactions**

**(Learning from each others)**

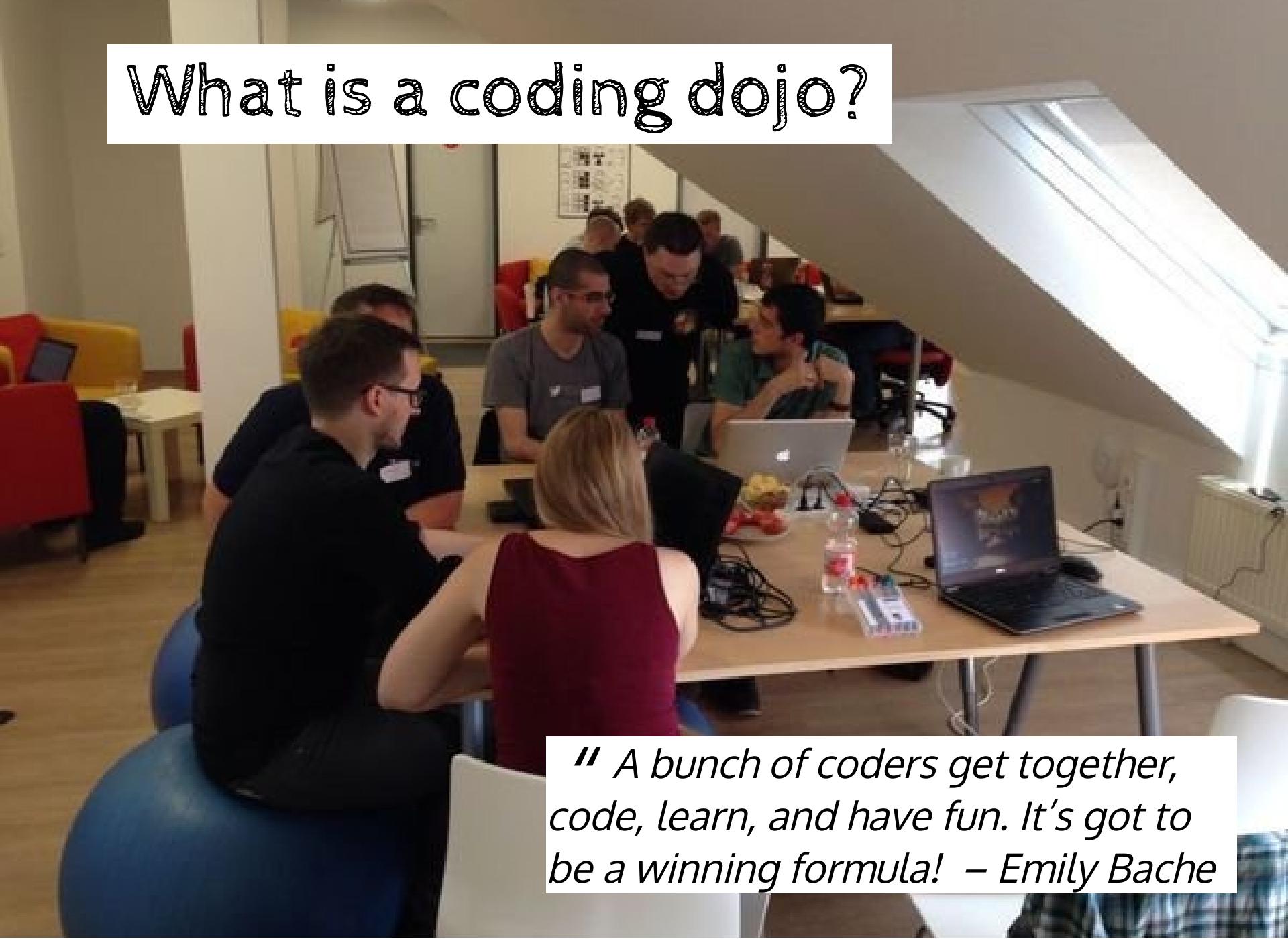
**Lifelong Learning**



**Clean Code**

**Continuous Improvement  
(Practice)**

# What is a coding dojo?

A group of people are gathered around a long wooden table in a bright, modern room with a large skylight. Several laptops are open on the table, and some people are looking at the screens while others are talking. The atmosphere appears collaborative and focused. In the background, there are more people and some colorful furniture like a yellow and red sofa.

*" A bunch of coders get together, code, learn, and have fun. It's got to be a winning formula! – Emily Bache*



# Why do we need a coding dojo?



- no managers, no deadlines
- **safe environment**
- **all professionals need to practice!**
- not all forms of practice are equal
- special way to practice
- designed to **emphasize skills** that are hard to acquire and easy to lose!

# Coding Dojo Principles

- **First Rule:** *Design cannot be discussed without Code, Code can not be shown without tests.*
- **Come with your relicts**
- **Learning Again**
- **Slow down**
- **Throwing yourself in**
- **Finding a master**
- **Subjecting to a master**
- **Mastering a subject**

# What do we practice?



- **Kata:** a Japanese word, meaning literally: "form" (型 or 形), is a **detailed choreographed pattern of movements** made to be **practiced alone**, but are also **practiced within groups** and in unison when training!
- **In Karate:** A kata is an exercise where you repeat a form many, many times, while making little improvements in each repetition!



# Characteristics of a Code Kata

- **Definition:** A kata is a defined solving flow of a **code exercise** made to be practiced many, many times **alone**, in **pairs** or as **groups** (e.g. MOB Programming) while making little improvements.
- **Duration:** Most exercises are quite short (~ **30 minutes to 1 hour**) so that one can incorporate them as routines in daily life!
- **Content:** Some involve **programming**, and can be coded in many different ways. Some are open ended, and involve **thinking** about the issues behind programming, e.g. architecture katas.
- **Focus:** The point of the kata is not arriving at a correct answer. The point is the stuff you learn along the way. **The goal is the practice, not the solution!**

*// TDD is used as a default pattern for coding!*

# FizzBuzz Kata

## Task:

- Write a program that prints the **numbers from 1 to 100 but:**
- ...for multiples of 3 print **Fizz**
- ...for multiples of 5 print **Buzz**
- ...for multiples of both 3 and 5 print **FizzBuzz**

## Example:

- 1, 2, **Fizz**, 4, **Buzz**, Fizz, 7, 8, Fizz, Buzz, 11, Fizz, 13, 14, **FizzBuzz**, 16, 17, Fizz, 19, Buzz, Fizz, 22, 23, Fizz, Buzz, 26, Fizz, 28, 29, ...

*first described in the essay "Fizz! Buzz!" (~1987) by David Langford as a **drinking game** of his teenage years in the 1960s*

## ...more selected Katas

- String Calculator Kata
- Bowling Game Kata (by Robert C. Martin)
- Prime Factors Kata (by Robert C. Martin)
- Diamond Kata by Seb Rose
- BankOCR Kata
- Ordered Jobs Kata
- Roman Numerals Kata
- Kebab Kata
- Game Of Life
- ...



# How do I facilitate a dojo meeting?

## Upfront:

- Book a room, Invite people, Print copies of kata description, prepare some slides for dojo introduction, inspect the chosen kata upfront

## Start:

- Line people up by experience and match people with the most with the ones with lowest etc. (folding queue)

## During:

- Facilitator needs to create good/healthy atmosphere, prompt interesting discussions, keep the code growing,
- Try not stop people when they mess up with TDD, let them learn from mistakes, wait until retro before saying anything!

# Code Retreat Day

**09:30 Intro/Talks**

**10:45 Round 1**

**11:45 Round 2**

**12:45 Lunch**

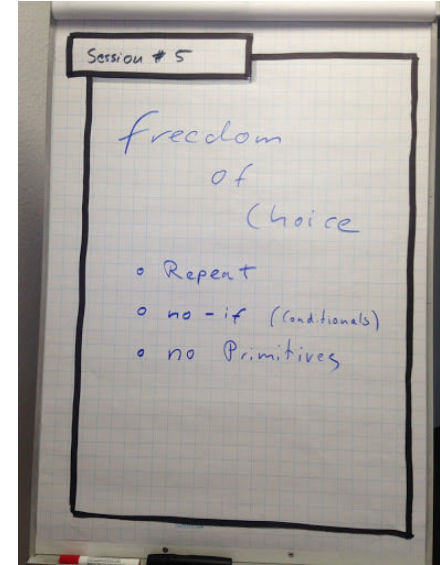
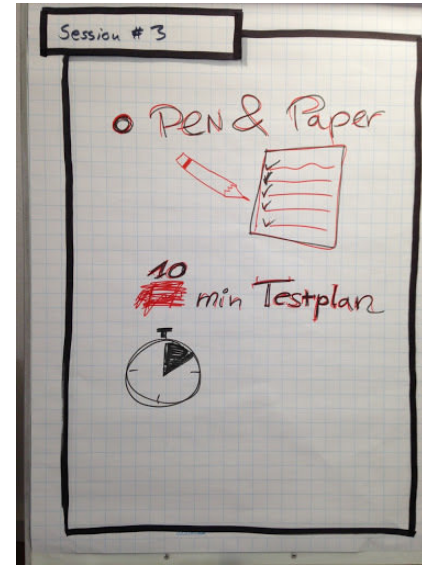
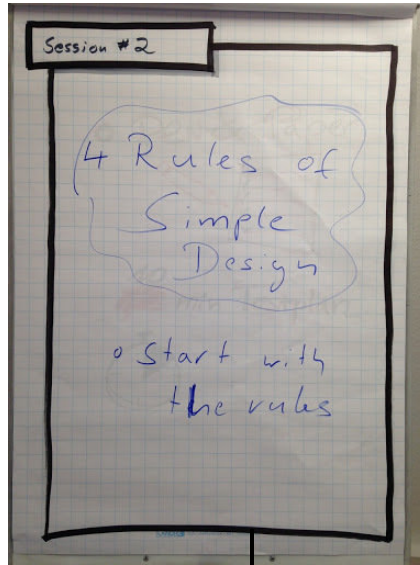
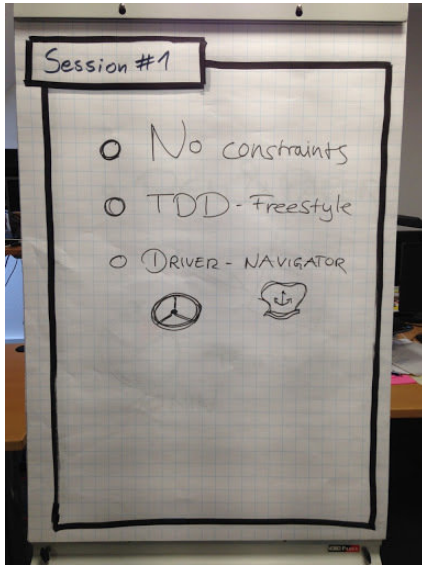
**13:30 Round 3**

**14:30 Round 4**

**15:30 Round 5**

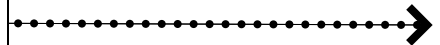
A format popularized by Corey Haines

# 45" code + 10" retro + 5" break



Kent Beck:

- passes all tests
- maximizes clarity/intention
- minimizes duplication (DRY)
- has fewer elements



Corey Haines: <https://leanpub.com/4rulesofsimpledesign>



# Constraints

- **Basic Activities**
  - Ping Pong
  - Navigator-Driver
- **Missing Tool Activities**
  - No Mouse
  - Text Editor only
  - Paper only
- **Missing Feature Activities**
  - No naked primitives
  - No conditional statements
  - No loops
- **Quality-Constraint Activities**
  - Only four lines per method
  - Immutables only, please
- **Stretch Activities**
  - Verbs instead of Nouns
  - Code Swap
  - Mute with find the loophole
  - TDD as if you meant it

# ...more Constraints

- Baby Steps
- Silent Coding (Mute)
- No If
- No IDE
- No Mouse
- Only One-Liners
- Every Cell is a Microservice (at Game of Life)
- ...

# Discussion points for retro

- Did you ever write **more code than you needed** to make the current tests pass?
- Did you ever have **more than one failing test** at a time?
- Did the tests **fail unexpectedly** at any point? If so, why?
- How much did **writing the tests slow** you down?
- Did you write **more tests** than you would have if you had coded first and written tests afterwards?
- Are you **happy with the design of the code** you ended up with? Should you have refactored it more often?





# Questions

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# Katalogues

- <http://kata-log.rocks>
- <https://leanpub.com/codingdojohandbook>
- <https://codingdojo.org/kata>
- <http://ccd-school.de/coding-dojo>
- <http://codekata.com>
- <http://www.thesoftwaregardener.com/agile/dojo-code-katas>
- <http://cyber-dojo.org>
- <http://es6katas.org>
- <https://www.codewars.com>
- <https://exercism.io>
- <http://katas.softwarecraftsmanship.org>

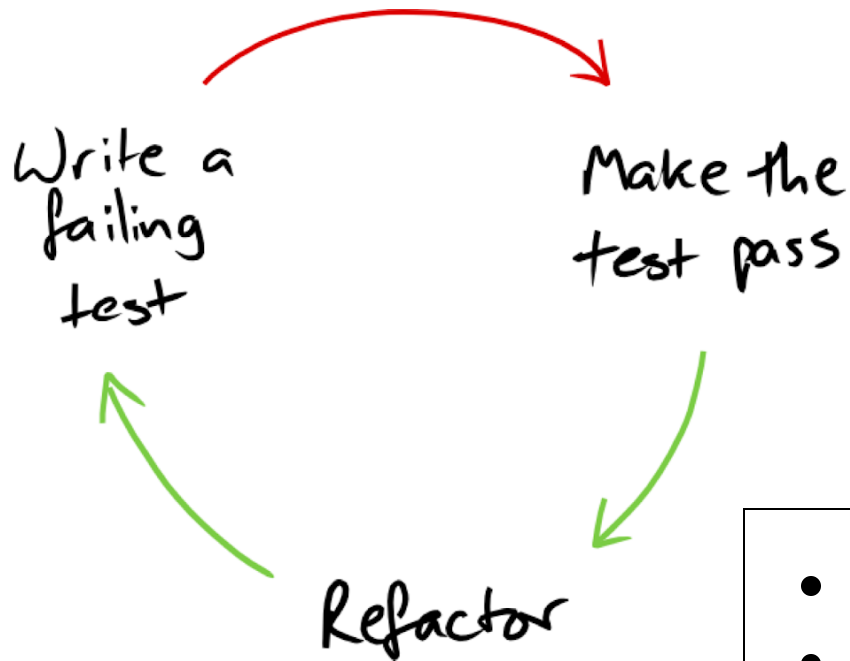




# TDD & Clean Code



# What is TDD? Why is it so hard?



## Goals:

- Higher dev speed
- Better code quality
- Patterns: AAA

- TDD is not about testing!
- TDD = specs/design
- QA is minor point
- TDD is living documentation
- Isolation, Focus
- Test new behaviour in babysteps

# Different TDD schools

- **London School (Mockist)**

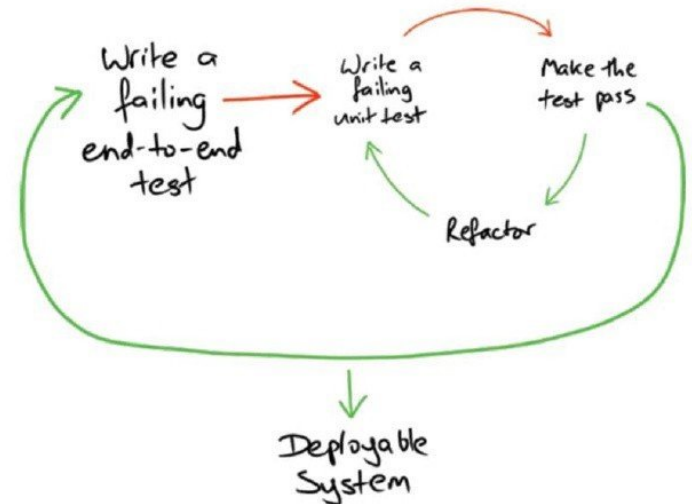
- Double Loop ATDD →
- Outside-In Design

- **Detroit School (Classicist)**

- Kent Beck, Uncle Bob...
- front-door testing
- state verification
- only mock the process boundary (DB, 3rd party)
- design emerges bottom-up / inside-out
- "TDD as if you meant it"

- **"Munich School"**

- *Fake-it Outside-In Design*



# "TDD as if you meant it"

1. You are not allowed to write **any production code** unless it is to **make a failing unit test pass**.
2. You are not allowed to write **any more of a unit test** than **is sufficient to fail**; and compilation failures are failures.
3. You are not allowed to write **any more production code** than is **sufficient to pass the one failing unit test**.

*Three rules by Robert C. Martin / Keith Braithwaite*



# SOLID Principles

- **Single responsibility (SRP)** "a class should have only a single responsibility"
- **Open/closed** "software entities... should be open for extension but closed for modification"
- **Liskov substitution** "objects should be replaceable with instances of their subtypes without altering the correctness of that program"
- **Interface segregation** "many client-specific interfaces are better than one general-purpose interface"
- **Dependency inversion** "depend upon abstractions, not concretions"

*by Robert C. Martin / Acronym by Michael Feathers*

# Other Principles

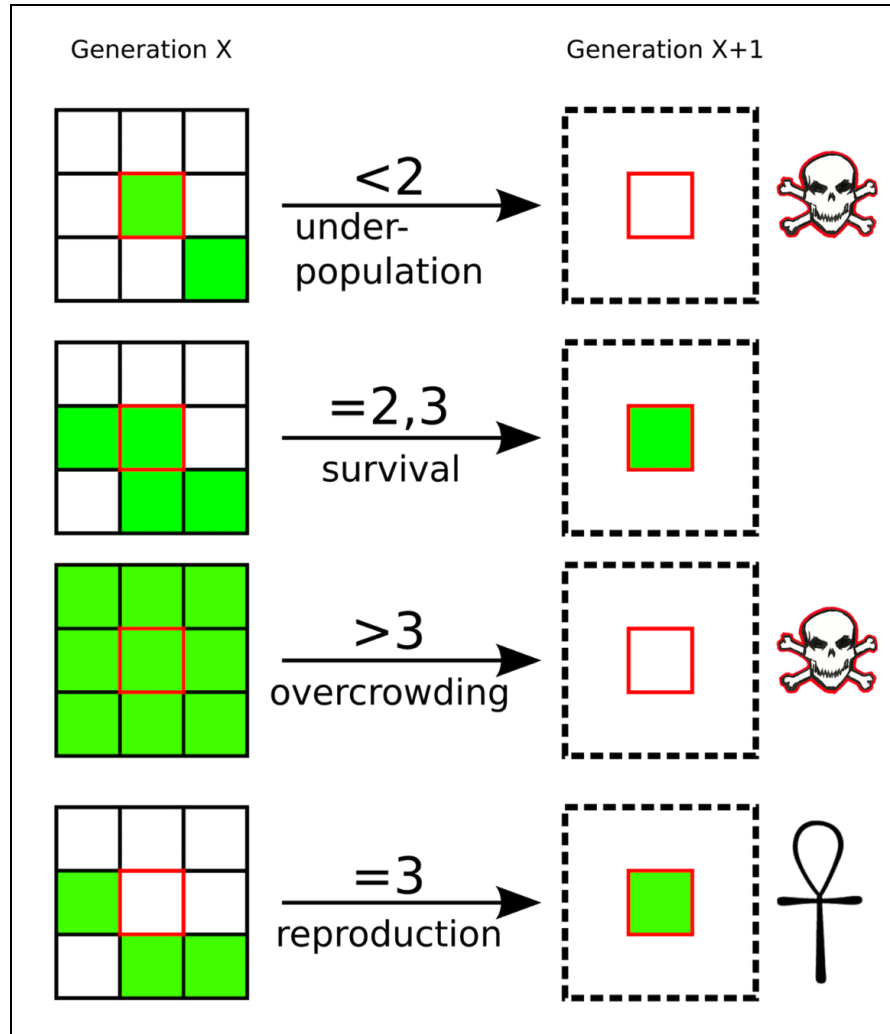
- **KISS** - "keep it simple, stupid"
- **DRY** - "Don't repeat yourself"
- **YAGNI** - "You aren't gonna need it"
- **DTSTTCPW** - "Do the simplest thing that could possibly work"
- ...
- ...
- ...

...and many more principles can be practiced with Katas!

# Practice

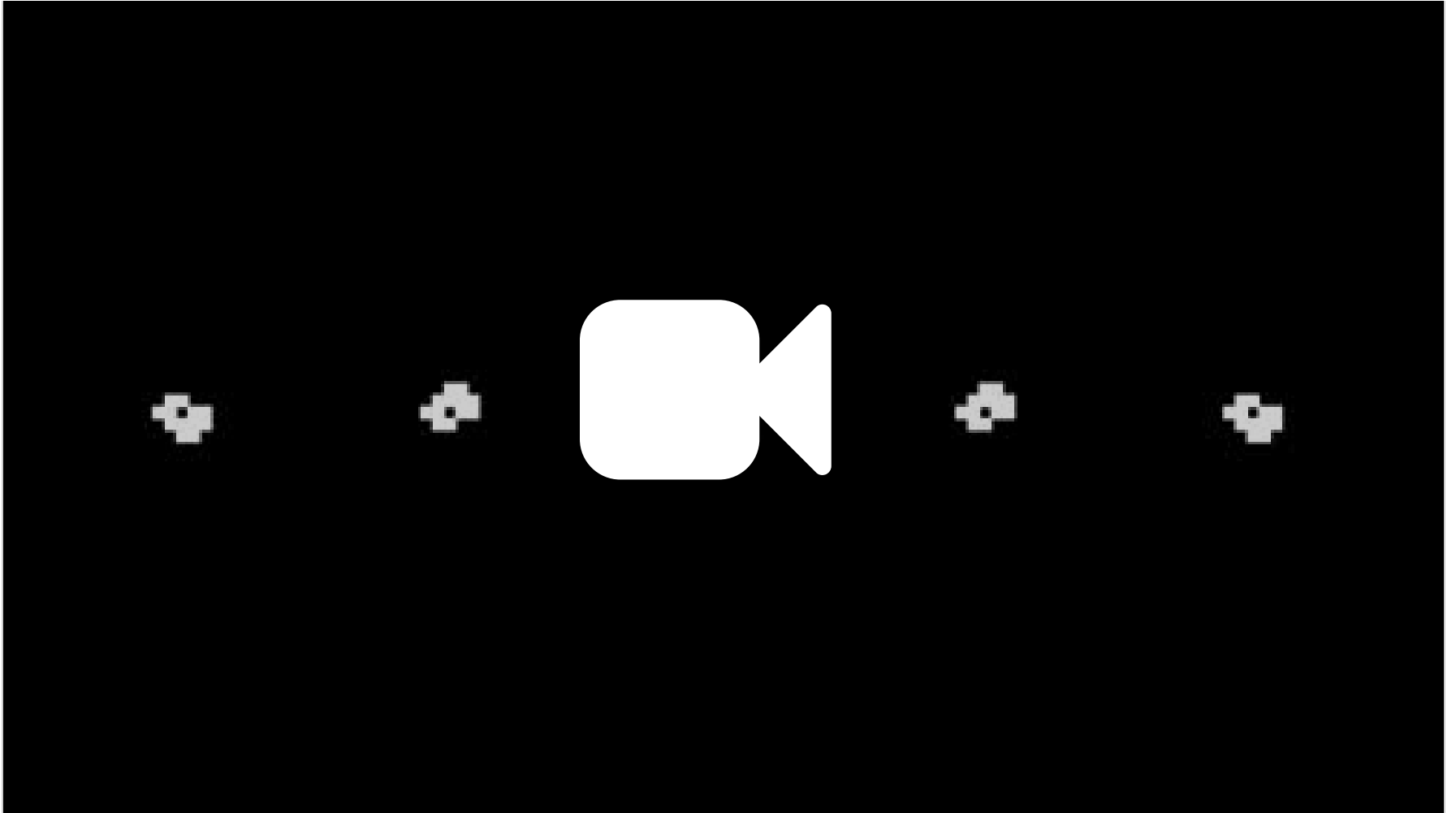


# Game of Life (GoL Poster)





# Game of Life (Video)



Life in life!

# Roman Numerals Kata

## Task:

- Write a method *String convert(int)* that takes a number and converts it to the according String representation.

## Examples:

1 → I  
2 → II  
3 → III  
4 → IV  
5 → V  
9 → IX

21 → XXI  
50 → L  
100 → C  
500 → D  
1000 → M

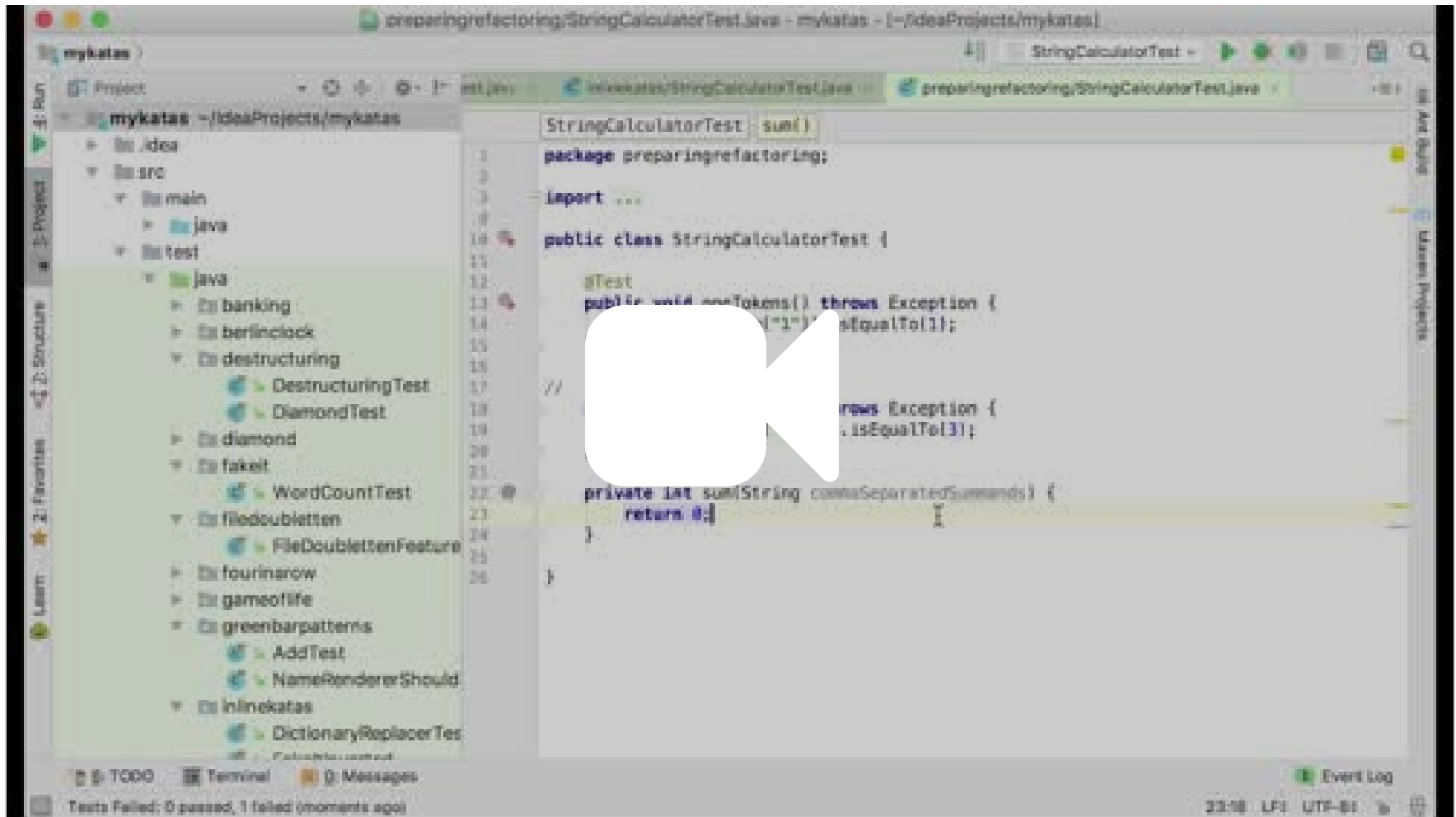
# String Calculator Kata

1. Create a simple String calculator with a method **int add(string numbers)**
  - can take **0, 1 or 2 numbers** and will return their sum, e.g. "" or "1" or "1,2"
  - Start with the simplest testcase of an empty string and move to 1 and 2 numbers
  - Remember to solve things as **simply as possible**
  - Remember to **refactor after each passing test**
2. Allow the **add method** to handle an **unknown amount** of numbers
3. Allow the **add method** to handle **newlines between numbers** instead of commas.
4. Support **different delimiters** with pattern: `//[delimiter]\n[numbers...]` , e.g. `"//;\n1;2"`
5. Calling add with a **negative number** should **throw an exception** "negatives not allowed"
6. Ignore **big numbers**, e.g. boundary is 1000 then  $1001 + 2 = 2$

...

Idea by Roy Osherove

# String Calculator Kata (Video)



Steps 1. + 2. = Solved with preparatory refactoring



# Diamond Kata by Seb Rose

Given a letter print a diamond starting with 'A' with the supplied letter at the widest point on the command line.

**Example for B**

```
  A
 _B_
  B
 _A_
```

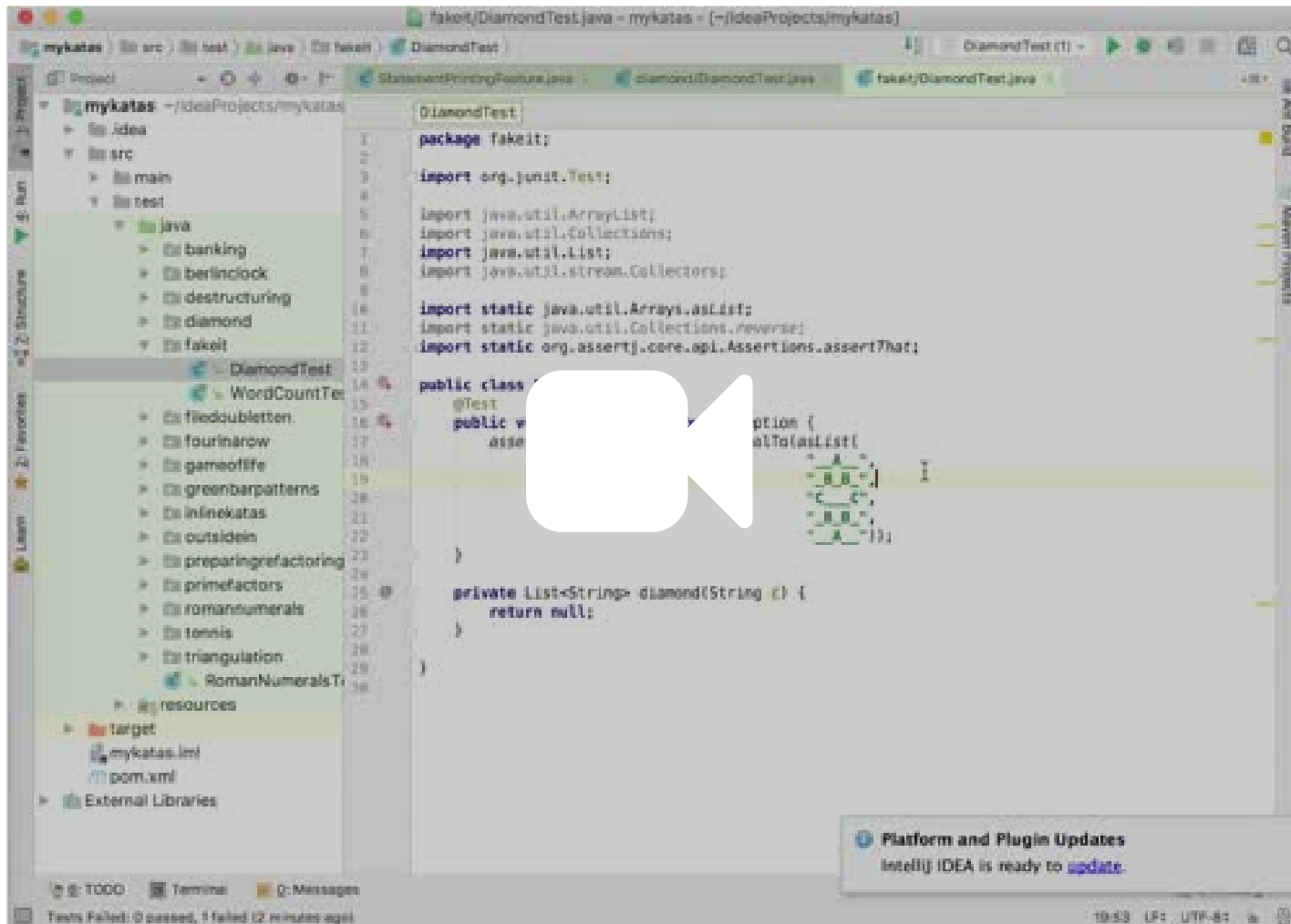
**Example for C**

```
  A
 _B_ B
 _C_ C
  B B
  A
```

**Example for E**

```
  A
 _B_ B
 _C_ C
  D D
 E E
  D D
  C C
  B B
  A
```

# Diamond Kata (Video)



Fake-it-inside-Out Approach