Spring Framework 7

Beginner to Guru

SOLID Principles of OOP

History of SOLID Principles of OOP

- The SOLID Principles of OOP date back to March of 1995
- The principles are from Robert Martin (aka Uncle Bob)
- Started as writings and blog posts
- Later became the foundation of Martin's book "Agile Software Development: Principles, Patterns, and Practices
- Michael Feathers is credited with establishing the SOLID acronym

SOLID Principles of OOP

- **S** - Single Responsibility Principle
- **O** - Open Closed Principle
- **L** - Liskov Substitution Principle
- **I** - Interface Segregation Principle
- **D** - Dependency Inversion Principle

Single Responsibility Principle

Just because you *can* doesn't mean you *should*.

Single Responsibility Principle

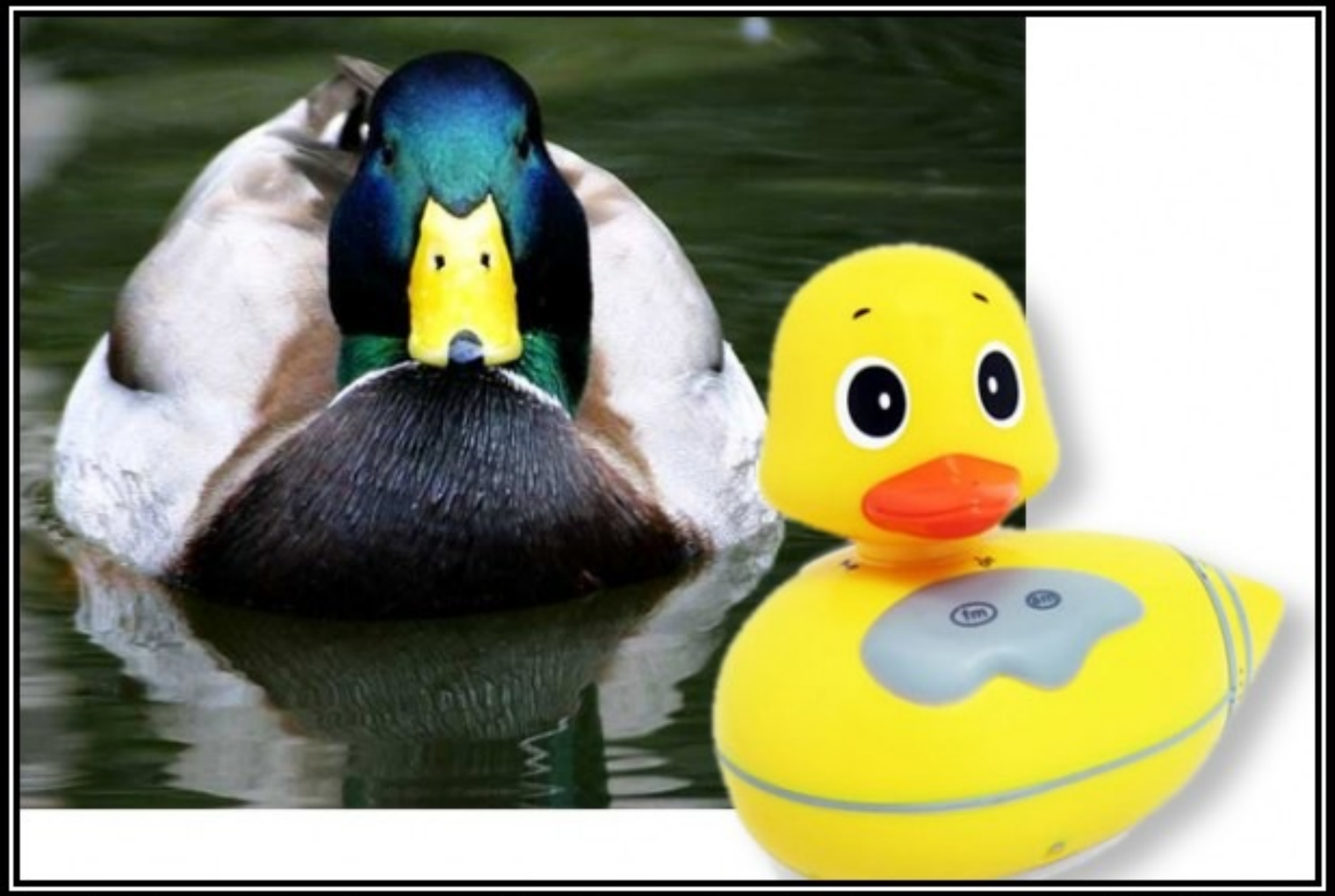
- Every Class should have a single responsibility.
- There should never be more than one reason for a class to change.
- Your classes should be small. No more than a screen full of code.
- Avoid ‘god’ classes.
- Split big classes into smaller classes.
- My 2000 line method tested “fine”

OPEN CLOSED PRINCIPLE

Open Chest Surgery Is Not Needed When Putting On A Coat

Open Closed Principle

- Your classes should be open for extension
- But closed for modification
- You should be able to extend a classes behavior, without modifying it.
- Use private variables with getters and setters - ONLY when you need them.
- Use abstract base classes

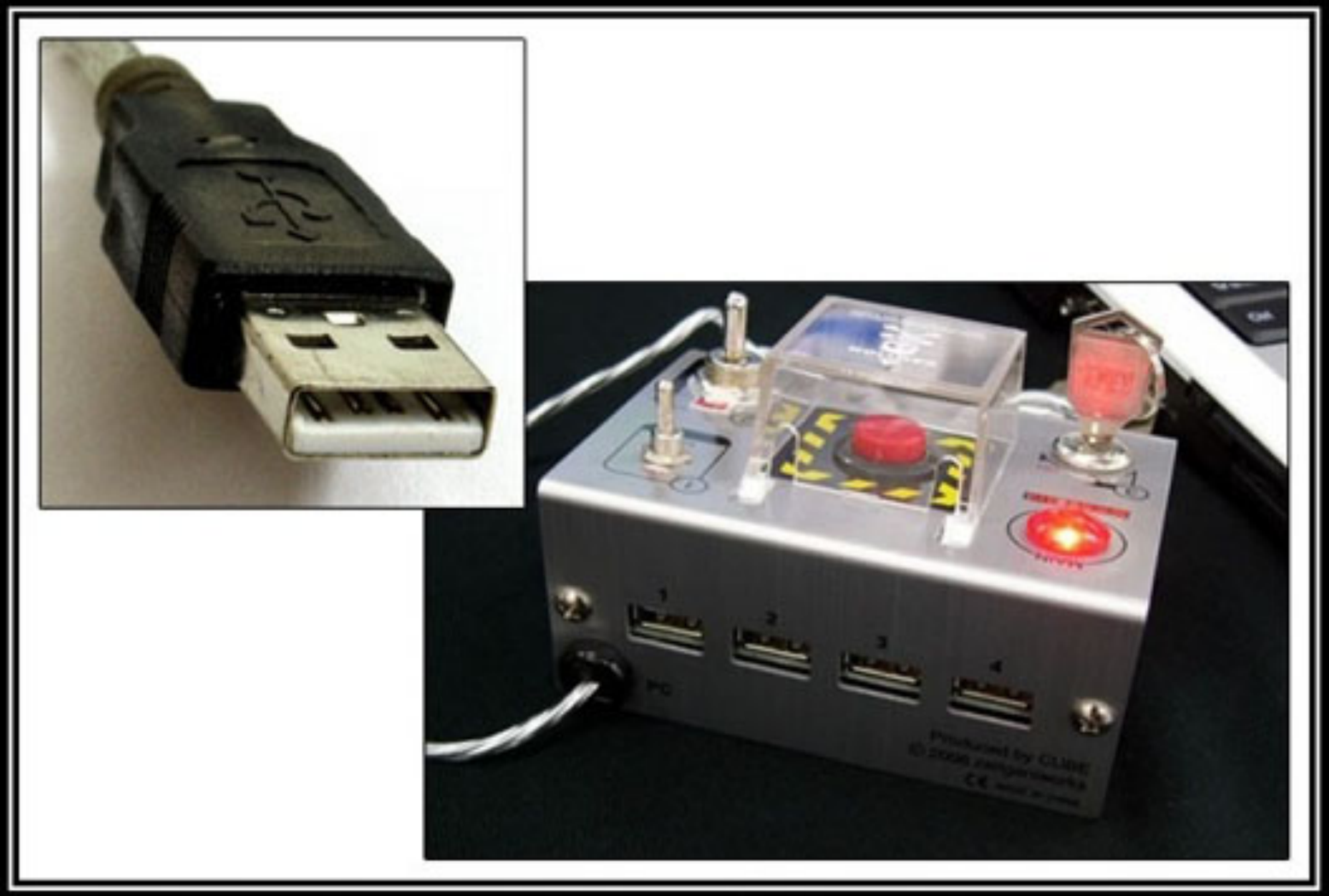


LISKOV SUBSTITUTION PRINCIPLE

If It Looks Like A Duck, Quacks Like A Duck, But Needs Batteries - You Probably Have The Wrong Abstraction

Liskov Substitution Principle

- By Barbara Liskov, in 1998
- Objects in a program would be replaceable with instances of their subtypes WITHOUT altering the correctness of the program.
- Violations will often fail the “Is a” test.
- A Square “Is a” Rectangle
- However, a Rectangle “Is Not” a Square



INTERFACE SEGREGATION PRINCIPLE

You Want Me To Plug This In, Where?

Interface Segregation Principle

- Make fine grained interfaces that are client specific
- Many client specific interfaces are better than one “general purpose” interface
- Keep your components focused and minimize dependencies between them
- Notice relationship to the Single Responsibility Principle?
- ie avoid ‘god’ interfaces

Dependency Inversion Principle

Would you solder a lamp directly
to the electrical wiring in a wall?

Dependency Inversion Principle

- Abstractions should not depend upon details
- Details should depend upon abstractions
- Important that higher level and lower level objects depend on the same abstract interaction
- This is not the same as Dependency Injection - which is how objects obtain dependent objects

Summary

- The SOLID principles of OOP will lead you to better quality code
- Your code will be more testable and easier to maintain
- A key theme is avoiding tight coupling in your code
- Be pragmatic when following SOLID
  - Every request path does not need its own controller class

SPRING FRAMEWORK

GURU