Solid and clean

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"Bad programmers worry about the code. Good programmers worry about data structures and their relationships."

Linus Torvalds



What will we see?

- > How to implement patterns within a given language
- > How to choose variables' names
- CamelCase vs snake_case
- Best coding practices

How to code properly

- > "Properly?"
- In such a way that your code becomes scalable, maintainable, robust..
- > Do engineer's job!



SOLID programming

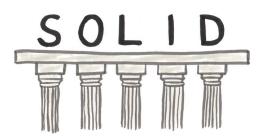
Aka: Object Oriented Design

Five principles that save your life make the difference between a programmer/coder and a software architect

Or between an happy person and a sad person

Applicable to object-oriented programming (but not only)

- 1. Single Responsibility
- 2. Open/Close principle
- 3. Liskov substitution
- 4. Interface segregation
- 5. Dependency inversion





Single responsibility principle

A software entity should have only one reason to change

Aka: every class should have a single responsibility or single job or single purpose

- > **Answers to**: "What should I put into a class?"
- > Pros: you always know where/what/how to change your code, and don't mess up things
- > (Cons: increase number of classes and effort...)



Open/Close principle

Entities should be open for extension, but closed for modification

 Aka: you should never change anything, always adding new behavior using polymorphism

> **Answers to**: "How should I extend my code?"

> **Pros**: reduce the number of bugs and headaches

> (Cons: N/A)



Liskov substitution principle

You should be able to substitute any parent class with any of their children without any behavior modification

> Aka: remember "Rectangles vs Squares"

- > Answers to: "When and what should I inherit?"
- > Pros: code is scalable, and minimize changes upon modifications
- > (Cons: you have to think before you code)
 - not actually a con...



Interface segregation principle

Many client specific interfaces are better than a big one

- > Aka: Interfaces should be the minimal set of behaviors you need
- > Answers to: "When should I create an interface?"
 - Spolier: "as much as you can"
- > **Pros**: you minimize dependencies in your code (thus, programming effort)
- > (Cons: trust me...NONE)

Always remember: an interface is a contract. You can build (automatic) tests over contracts!



Dependency inversion principle

Your project shouldn't depend of anything, make those things depend of interfaces

- > Design wrappers around your dependencies
 - (This is NOT "dependency injection"...but its good friend)

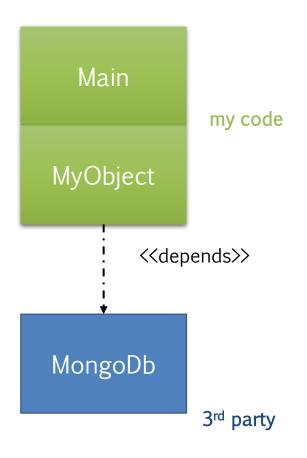
- > Answers to: "How can I avoid getting crazy with dependencies?"
- > **Pros**: isolation between code components; your code reflects the analysis/model of business
- > (Cons: additional programming effort)



Dependency inversion principle

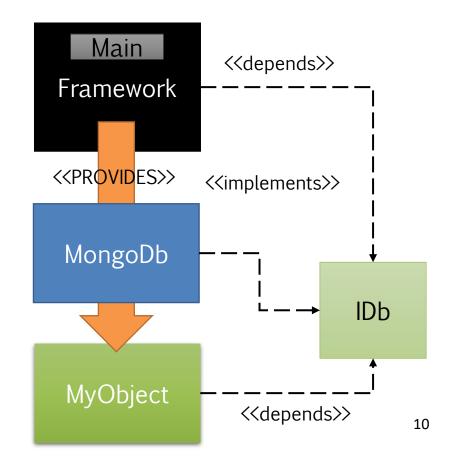
Library

> Tied to 3rd party code



Framework

- > Inversion of control
- > Dependency injection





References



Course website

> http://hipert.unimore.it/people/paolob/pub/Industrial_Informatics/index.html

My contacts

- > paolo.burgio@unimore.it
- > http://hipert.mat.unimore.it/people/paolob/

Resources

- https://springframework.guru/solid-principles-object-oriented-programming/
- A "small blog"
 - http://www.google.com