

Programming Technologies

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Outline

- Software Crisis
- Answers for Software Crisis
- Software Methodologies
- OOP Principles
- OOP Design Principles
- OOP Design Patterns

Software Crisis

- Software projects are unsuccessful!
- In 60's the vast majority of software projects were unsuccessful, because:
 - The project never ended.
 - The project ran out of time.
 - The project ran out of budget
 - The product does not meet the requirements.
- Still the half of the software projects are unsuccessful!

Answers for Software Crisis

- Software Methodologies
- Software Languages
- Best Practices

Software Methodologies

- Structured Software Methodologies
 - Waterfall
 - SSADM
 - V-model
- Iterative Software Methodologies
 - RUP
 - Prototype model
- Agile Software Methodologies
 - SCRUM
 - XP

OOP Principles

- Abstraction
- Inheritance
- Encapsulation
- Polymorphism

OOP Design Principles

- GOF₁
- GOF₂
- OCP
- SRP
- LSP (Liskov Substitutional Principle)
- Hollywood Principle

GOF1

- Program to an interface, not an implementation.
- This means that:
 - You should use abstract ancestor classes.

GOF2

- Favor object composition over class inheritance.
- Types of object compositions:
 - Aggregation
 - Composition
- Other names of object compositions:
 - Wrapping
 - HAS-A connection

OCP

- Classes should be open for extension, but closed for modification.

SRP

- A class should have only one reason to change.
- This is the flagship between the OOP Design Principles.
- It show when to break up a big class into smaller ones.

LSP (Liskov Substitutional Principle)

- „If for each object o_1 of type S there is an object o_2 of type T such that for all programs P defined in terms of T , the behavior of P is unchanged when o_1 is substituted for o_2 then S is a subtype of T .”

Hollywood Principle

- Don't call us, we'll call you!
- It is used in the Observer design pattern.
- It shows us that is good to be lazy!

OOP Design Patterns

- Singleton
- Thread-Safe Singleton
- Factory Method
- Observer
- Proxy
- Decorator
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Thank you!

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