OOP

Oblikovni obrasci kratki pregled

U ovom poglavlju naučit ćete

- Što je ideja oblikovnih obrazaca
- SOLID principi
- Adapter, Factory, Singleton primjer

Oblikovni obrasci

- a general repeatable solution to a commonly occurring problem
- drafts of solutions, not their implementation
- tested, proven approach paradigms
- speed up application development
- increase the readability of the code
- reduce the need for changes
- must not be purpose in itself



Intro – design patterns

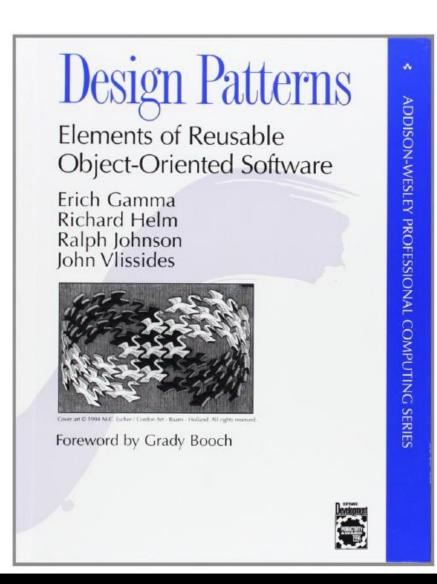
- John Lennon: "There are no problems, only solutions"
- We solve problems that have had to solve countless time before
- Knowledge of patterns => breaking down complex solutions, develop applications in uniformed way with TRIED and TRUSTED solutions

Intro – design patterns (2)

- Design pattern (DP) = high-level abstract solution templates
- Language agnostic
- Origin: C. Alexander, 1970, architecture
- Origin in software development: Design Patterns: Elements of Reusable Object-Oriented Software (GoF)
 - 23 design patterns, 3 groups



GoF





Common design principles

- Keep It Simple Stupid (KISS)
- Don't Repeat Yourself (DRY)
- You Ain't Gonna Need It (YAGNI)
- Separation of Concerns (SoC)
- Liskov Substitution Principle (LSP)
- Interface Segregation Principle (ISP)
- Dependency Inversion Principle (DIP)
- Dependency Injection (DI) and Inversion of Control (IoC)



S.O.L.I.D design principles

- Single Responsibility Principle (SRP)
- Open-Closed Principle (OCP)
- Liskov Substitution Principle (LSP)
- Interface Segregation Principle (ISP)
- Dependency Inversion Principle (DIP)



Single Responsibility Principle (SRP)

- Responsibility is considered to be one reason to change
- If we have 2 reasons to change for a class, we have to split the functionality in two classes
- A class should have only one reason to change.

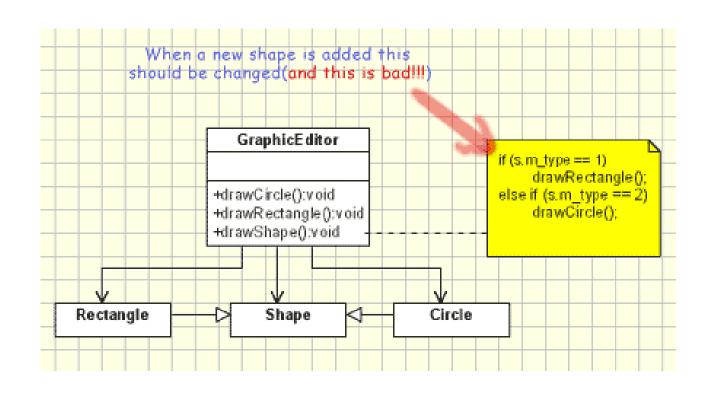


Open Closed Principle (OCP)

- Design and writing of the code should be done in a way that new functionality should be added with minimum changes in the existing code.
- The design should be done in a way to allow the adding of new functionality as new classes, keeping as much as possible existing code unchanged.
- Software entities like classes, modules and functions should be open for extension but closed for modifications.

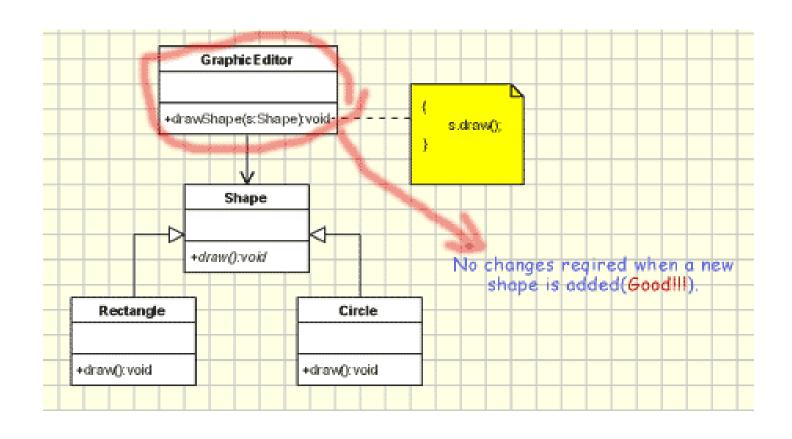


Open Closed Principle(2) – bad example





Open Closed Principle(3) – good example





Liskov's Substitution Principle (LSP)

- All the time we design a program module and we create some class hierarchies. Then we extend some classes creating some derived classes
- We must make sure that the new derived classes just extend without replacing the functionality of old classes. Otherwise the new classes can produce undesired effects when they are used in existing program modules.
- Derived types must be completely substitutable for their base types.



Interface Segregation Principle (ISP)

- Clients should not be forced to implement interfaces they don't use.
- Instead of one fat interface many small interfaces are preferred based on groups of methods, each one serving one submodule.
- Clients should not be forced to depend upon interfaces that they don't use.



Dependency Inversion Principle (DIP)

- High-level modules should not depend on low-level modules. Both should depend on abstractions.
- Abstractions should not depend on details.
 Details should depend on abstractions.
- Repeat that [©]



Podjela dizajnerskih predložaka

- Kreacijski predlošci
 - Singleton
 - Factory
 - Abstract Factory
 - Factory Nethod
 - Builder
 - Prototype
 - Object Pool



Podjela dizajnerskih predložaka

- Strukturalni predlošci
 - Facade
 - Adapter
 - Bridge
 - Composite
 - Decorator
 - Flyweight
 - Proxy



Podjela dizajnerskih predložaka

- Predlošci ponašanja
 - Chain of Responsibility
 - Command
 - Interpreter
 - Iterator
 - Mediator
 - Memento
 - Observer
 - Strategy

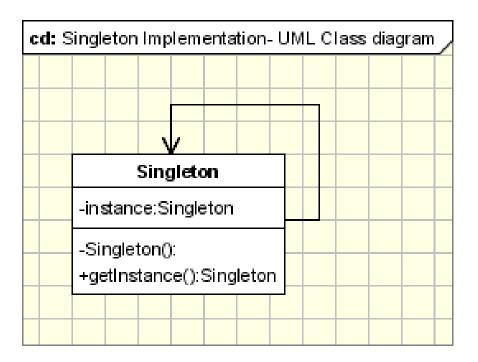


Podjela dizajnerskih predložaka(2)

- Predlošci ponašanja
 - Template Method
 - Visitor
 - Null Object

Singleton

• Cilj: Osigurati da će se kreirati samo jedna (N) instanca neke klase



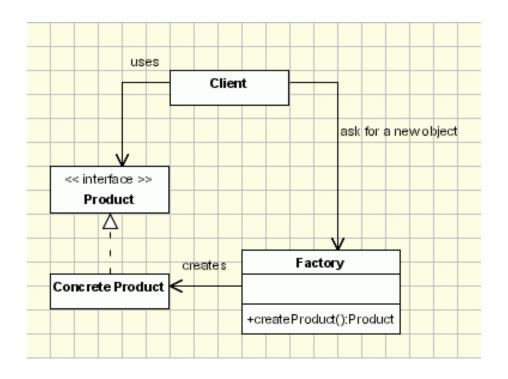


Singleton(2)

- Gdje ga koristiti?
 - Logiranje
 - Konfiguracijske klase
 - "Factories"

Factory

 Cilj: Kreirati objekte bez da se logika kreiranja prikazuje klijentu





Factory(2)

- Gdje ga koristiti?
 - Gdje ne 😊
 - Vjerojatno najčešće korišteni predložak u OOP rješenjima
- Tipični problemi
 - Parametrizirani "Factory"

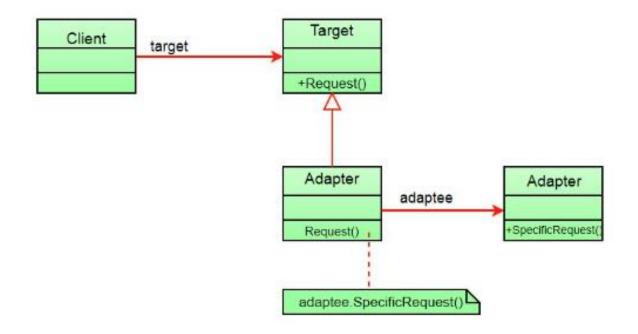


Adapter

Gdje ga koristiti?

• Suradnja između klasa koje inače ne bi mogle raditi zajedno zbog inkompatibilnosti njihovih sučelja

Adapter



Hvala na pažnji!