Tutorial 3 More on Design patterns

Study Several Examples of Design Patterns Explain its relation to our course projects

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Today...

- Design patterns structures
 Creational patterns
 Structural patterns
 Behavioural patterns
- 2. How are they related to each other?
- 3. Design patterns by examples Some special design in OpenOME
- 4. Their relation to your course project

Last lecture...
On design patterns

- We explained what are patterns, what are design patterns
- How are they categorized?
- How to apply them?
- How to identify them?
- How to assess them?

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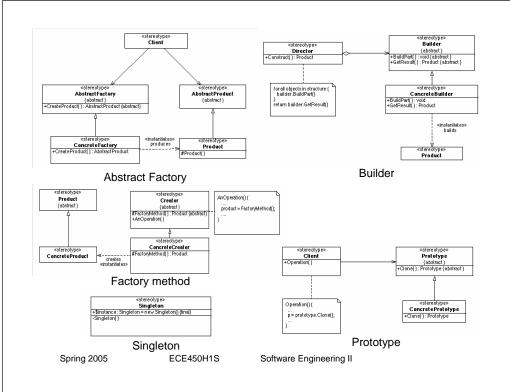
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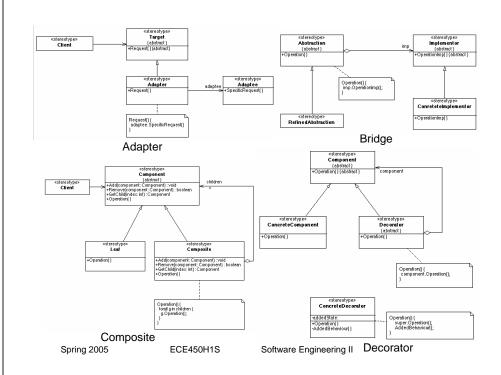
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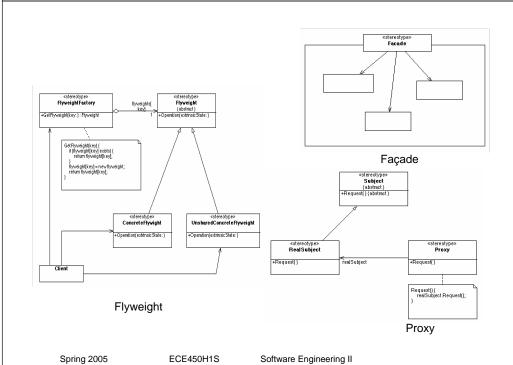
1. The GOF Catalogue

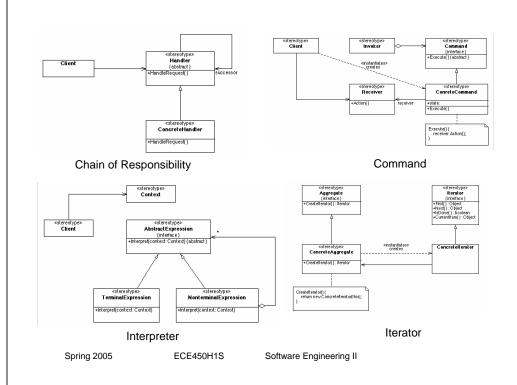
- Creational
 Abstract Factory, Builder, Factory method, Prototype, Singleton
- Structural Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy
- Behavioural
 Chain of Responsibility, Command, Interpreter,
 Iterator, Mediator, Memento, Observer, State,
 Strategy, Template Method, Visitor

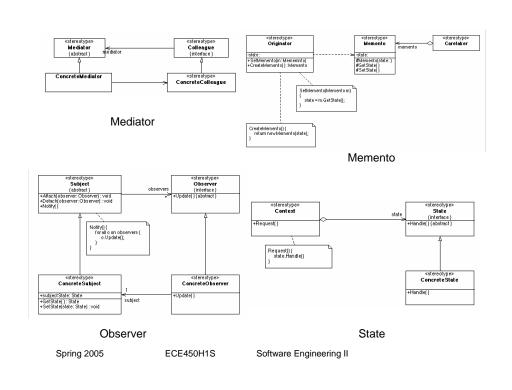
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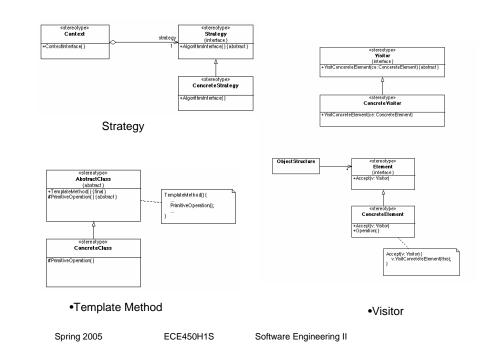




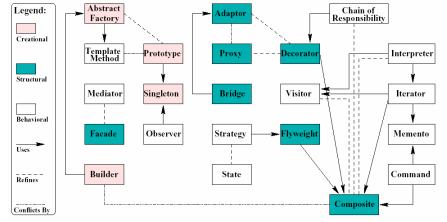








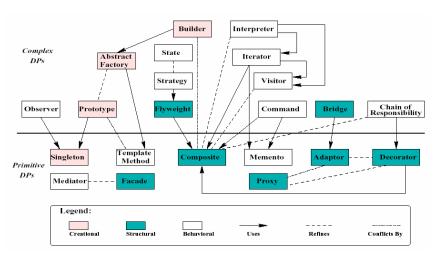
2. Relation among patterns



Ladan Tahvildari and Kostas Kontogiannis. "On the Role of Design Patterns in Quality-Driven Re-engineering"

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A layered version



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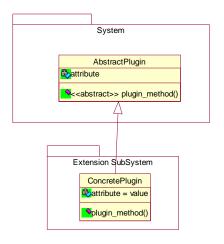
3. Some Special design patterns in our legacy software

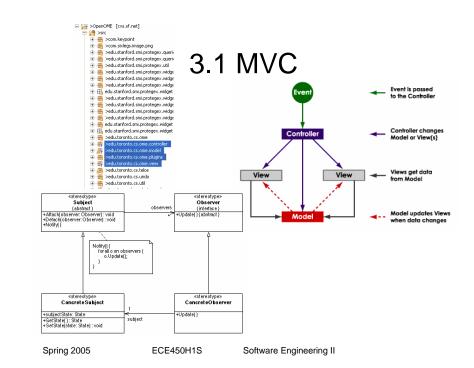
- MVC patterns
 classic design pattern from SmallTalk
 Most editors follows the pattern
- Plugin patternsOpenOME, Protégé, Eclipse
- Meta-modelling patterns Telos, EMF, UML, Protégé

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3.2 Plugin patterns







3.2.1 OpenOME

- AbstractPluginMethod.java
 - PluginMethod.java
- OMEPlugin.java
 - OMEDefaultPlugin.java
 A bunch of methods
 - Extended by ...
- edu.toronto.cs.ome.plugins
 - ERPlugin.java
 - NFRPlugin.java
 - IStarPlugin.java
 - ...
- Plugin is selected at run-time, depending on the input class.ForName(...)

 COMEDefaultPlugin(OMEModel) getMenubarMethods(View) AddAttribute AddAttributeSubr AddAttributeSubsubmen AddChildMethod ChangeLinkDirectionMethor ChangeLinkSourceMethod ChangeLinkCourceMethod
ChangeLinkTypeMethod
CloseMethod
CopyMethod
CutMethod
DeleteMethod
DeselectMethod ExpandMethod ExportMethod HelpContentMe HideMethod HighlightMethod LayOut ModifyCommentMetho NewMethod
OpenMethod
PasteMethod
PromoteChildMethod RemoveAttribute Demove ättrihuter RemoveAttributeSu.
RenameMethod
ResizeMethod
SaveAsMethod
SaveAsSmiMethod
SaveMethod
SaveMethod
SelectBackgroundCi
SelectMethod
SpikMethod
SpikMethod
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SpikMethod
SpikMethod
SpikMethod
SpikMethod StraightenAlMetho StraightenAlmethod ToggleIntentionMeth UnexpandMethod UnhideAllMethod

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3.2.2 Protégé

- <u>ClsWidget</u>, <u>ExportPlugin</u>, <u>ImportPlugin</u>, <u>ProjectPlugin</u>, <u>SlotWidget</u>, <u>TabWidget</u>, Widget
- Plugins are packaged into a JAR file, under the "plugins" subdirectory
- OMETab.java is a TabWidget plugin packaged as plugins/edu.toronto.cs.ome/OpenOME.jar

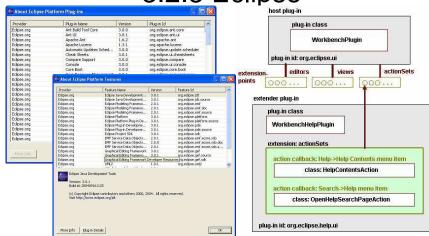
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3.2.3 Eclipse



http://www.eclipse.org/articles/Article-Plug-in-architecture/plugin_architecture.html

And many articles on its plugin developments ... plugin.xml, feature.xml

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4. Think about these ...

- How would you classify the classes in edu.toronto.cs.ome.OME into the MVC pattern?
- Which design pattern is used by Web-Service projects?
- Which basic design patterns are used by the aforementioned Plugin patterns?

5. Relation to your project

- Opportunities:
 - You may add junit test cases to the code base to reveal bugs (publish it to the bug tracking system) and fix them (+5%)
 - You may apply design patterns, refactoring techniques on this legacy code base, showing as an improved complexity metrics (+2.5%)
 - You may tune the performance of the system to speed up the display, load/save for scalable graphs (+2.5%)
- Don't forget your major project task (up to 100%!)
 - To study the editor methods in the OpenOME and adapt them to the OmniGraphEditor web service.

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