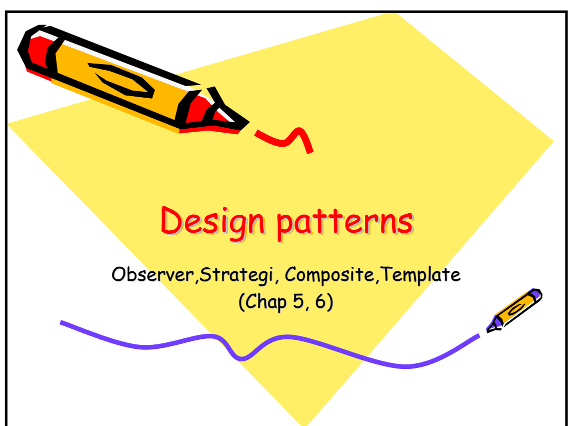
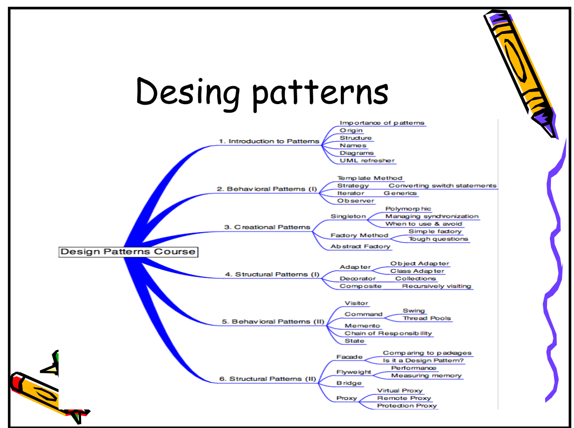


Design patterns

Observer,Strategi, Composite,Template
(Chap 5, 6)

The Pattern Concept

- Each pattern has
  - a short *name*
  - a brief description of the *context*
  - a lengthy description of the *problem*
  - a prescription for the *solution*

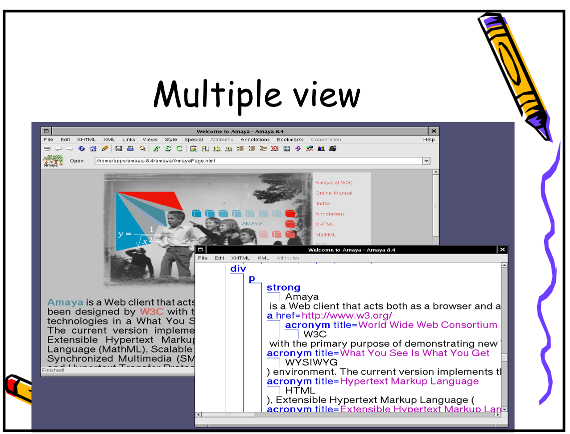


Desing patterns

Multiple view

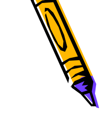
Some programs have multiple editable views

- editing one view updates the other
- updates seem instantaneous

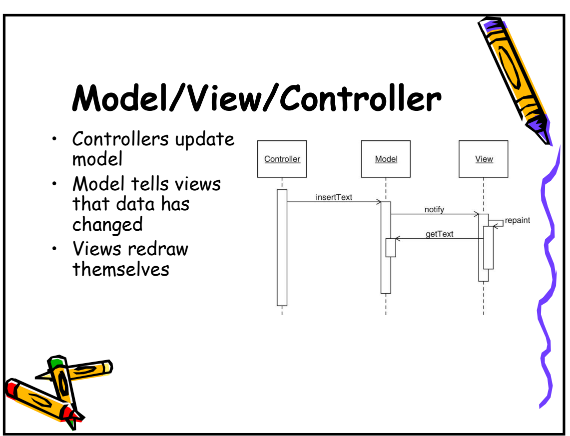


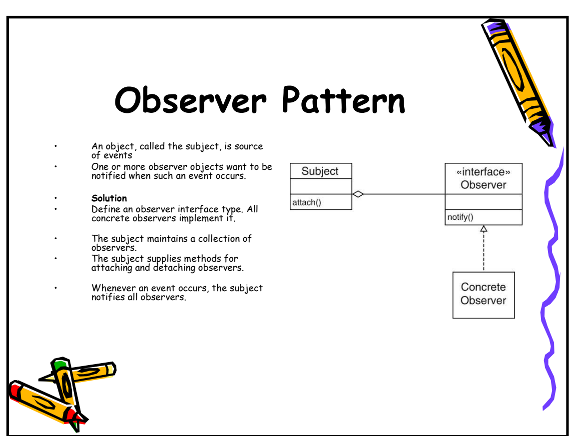
Multiple view

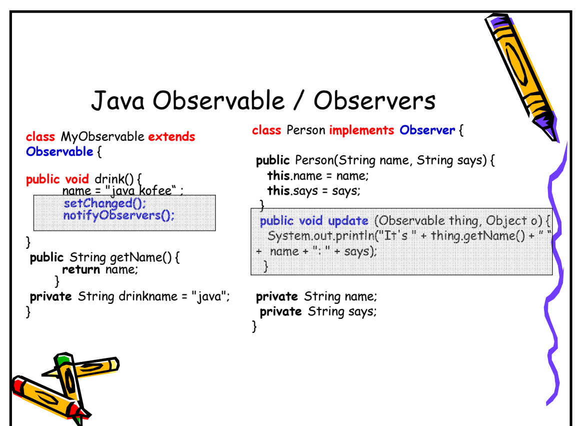
Model/View/Controller

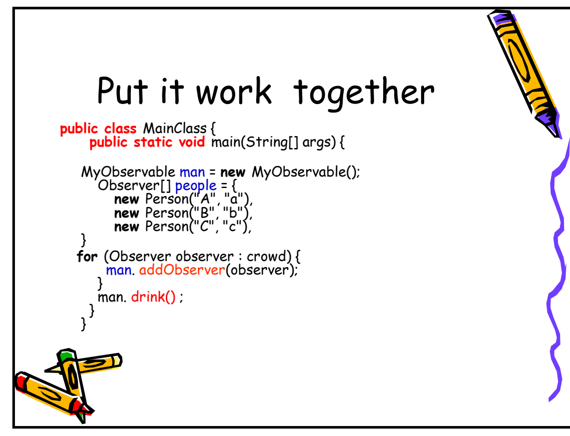


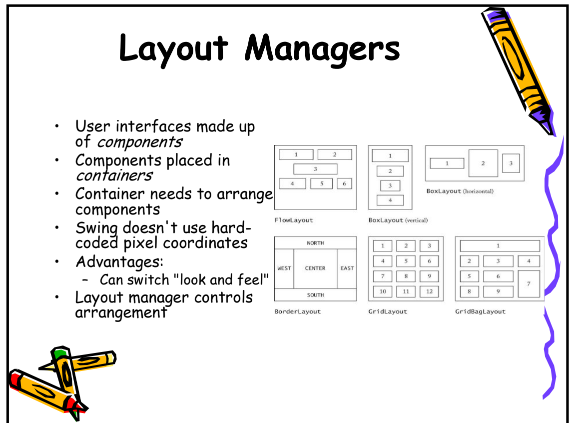
- Model: data structure, no visual representation
- Views: visual representations
- Controllers: user interaction

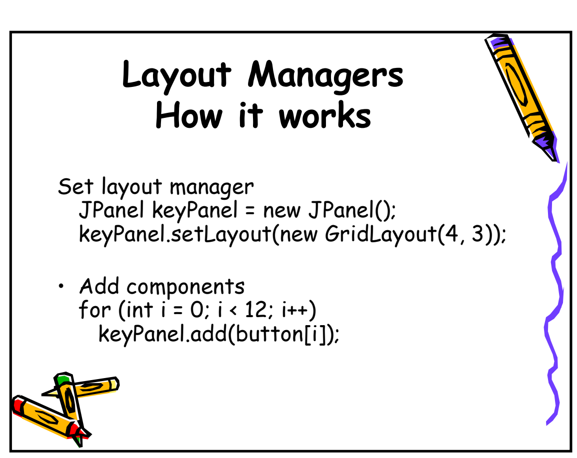

Model/View/Controller
Controllers update model
Model tells views that data has changed
Views redraw themselves
Controller
Model
View
insertText
notify
repaint
getText

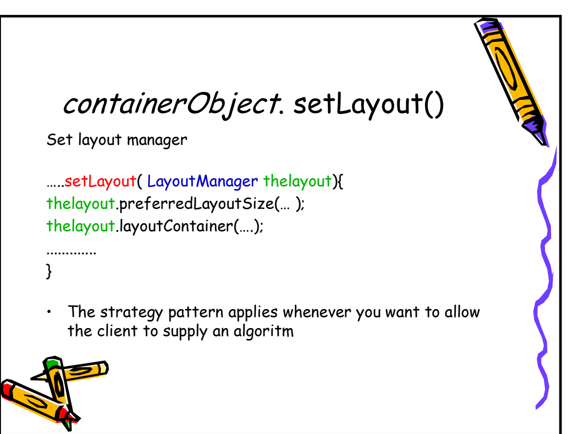

Observer Pattern
An object, called the subject, is source of events
One or more observer objects want to be notified when such an event occurs.
Solution
Define an observer interface type. All concrete observers implement it.
The subject maintains a collection of observers.
The subject supplies methods for attaching and detaching observers.
Whenever an event occurs, the subject notifies all observers.
Subject
attach()
«interface» Observer
notify()
Concrete Observer

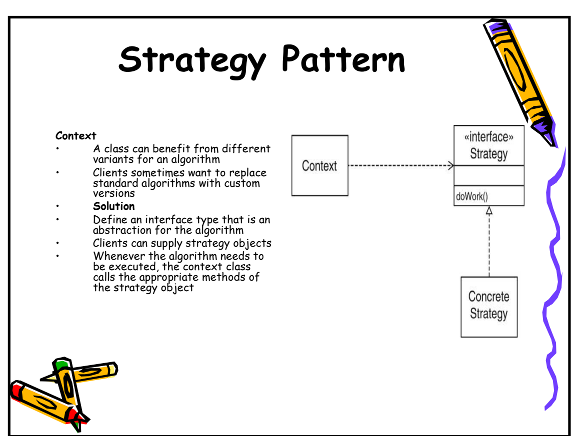

Java Observable / Observers
class MyObservable extends Observable {
public void drink() {
name = "java kofee" ;
setChanged();
notifyObservers();
}
public String getName() {
return name;
}
private String drinkname = "java";
}
class Person implements Observer {
public Person(String name, String says) {
this.name = name;
this.says = says;
}
public void update (Observable thing, Object o) {
System.out.println("It's " + thing.getName() + " "
+ name + ": " + says);
}
private String name;
private String says;
}


Put it work together
public class MainClass {
public static void main(String[] args) {
MyObservable man = new MyObservable();
Observer[] people = {
new Person("A", "a"),
new Person("B", "b"),
new Person("C", "c"),
}
for (Observer observer : crowd) {
man. addObserver(observer);
}
man. drink() ;
}
}


Layout Managers
User interfaces made up of components
Components placed in containers
Container needs to arrange components
Swing doesn't use hard-coded pixel coordinates
Advantages:
Can switch "look and feel"
Layout manager controls arrangement
FlowLayout
BoxLayout (vertical)
BoxLayout (horizontal)
NORTH
WEST
CENTER
EAST
SOUTH
BorderLayout
GridLayout
GridBagLayout

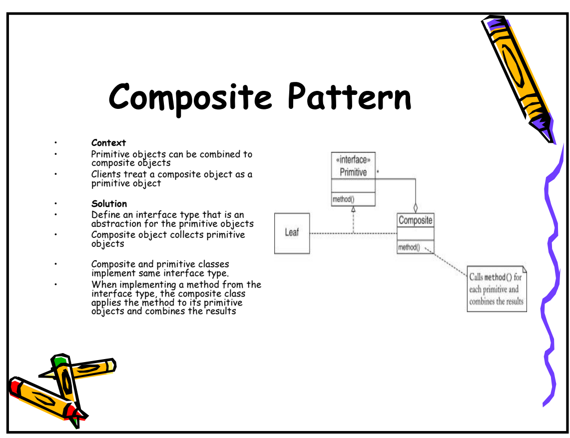

Layout Managers
How it works
Set layout manager
JPanel keyPanel = new JPanel();
keyPanel.setLayout(new GridLayout(4, 3));
Add components
for (int i = 0; i < 12; i++)
keyPanel.add(button[i]);





Containers and Components

- Containers collect GUI components
- Sometimes, want to add a container to another container
- Container should *be* a component
- Composite design pattern
- Composite method typically invoke component methods
- E.g. Container.getPreferredSize invokes getPreferredSize of components



How to Recognize Patterns

- Look at the *intent* of the pattern
- Remember common uses (e.g. STRATEGY for layout managers, Observers for updating views)
- Implement examples for comon patterns