Observer DP

I remember growing up with television, from the time it was just a test pattern, with maybe a little bit of programming once in a while. – Francis Ford Coppola

Problem

- Weather information is available via functions:
  - getTemperature, getHumidity and getPressure
- When any whether parameter changes,
  - the measurementsChanged function is called.
  - We need to update the display of
    - Temperature. It shows average temp, max temp, min temp.
    - Current conditions.
    - Forecast.
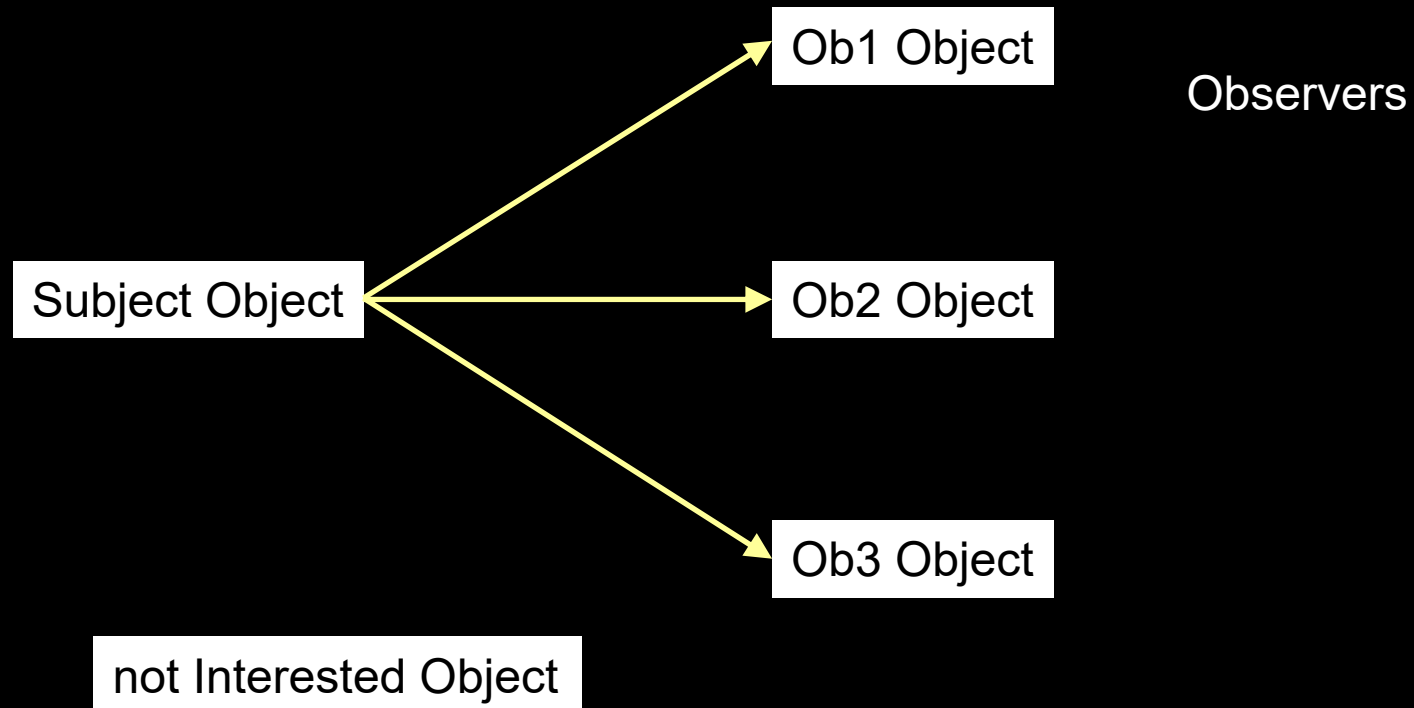   - Custom plug-in displays.

Dirty Solution

```
public class WhetherData {
  public void measurementsChanged() {
    double t = getTemperture();
    double h = getHumidity();
    double p = getPressure();
    tempStatisticsDisplay.update(t, h, p);
    currentConditionsDisplay.update
        (t, h, p);
    forcastDisplay.update(t, h, p);
    //Call custom displays here.
  }
…}
```
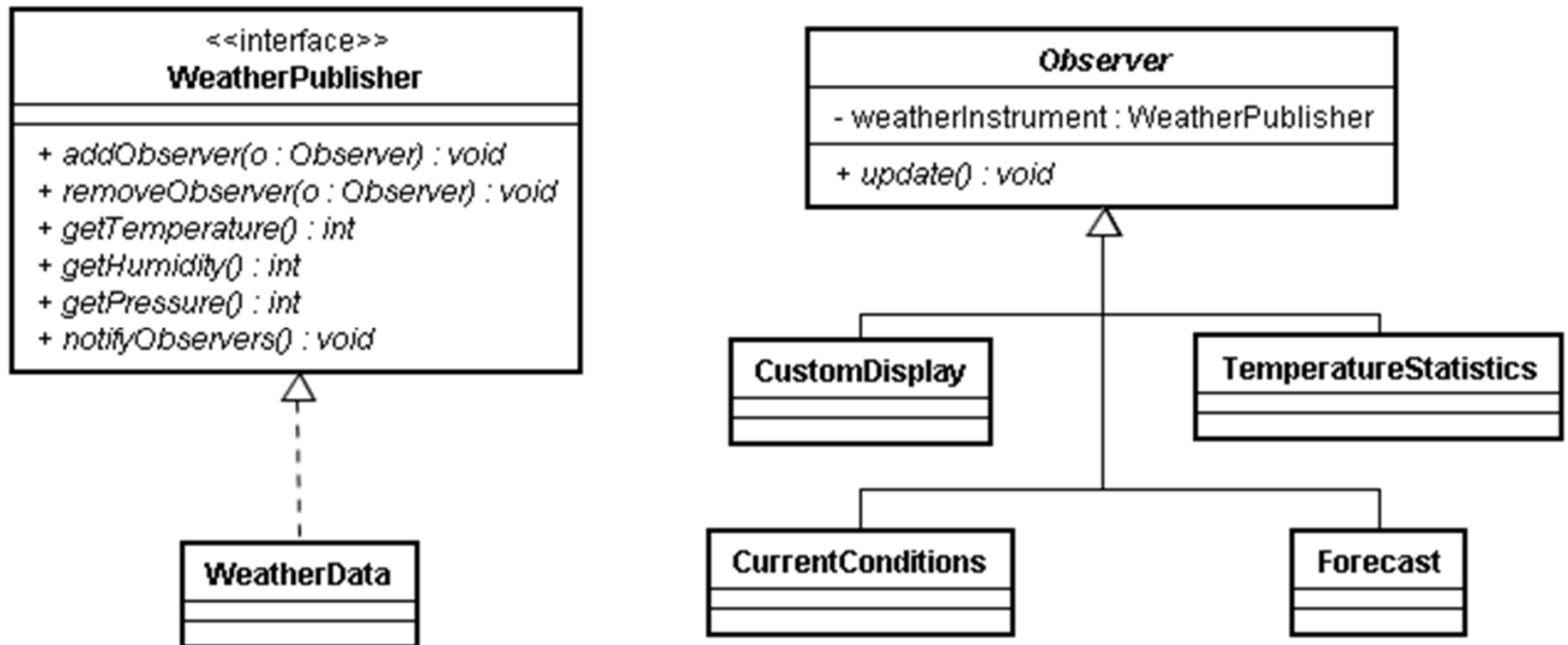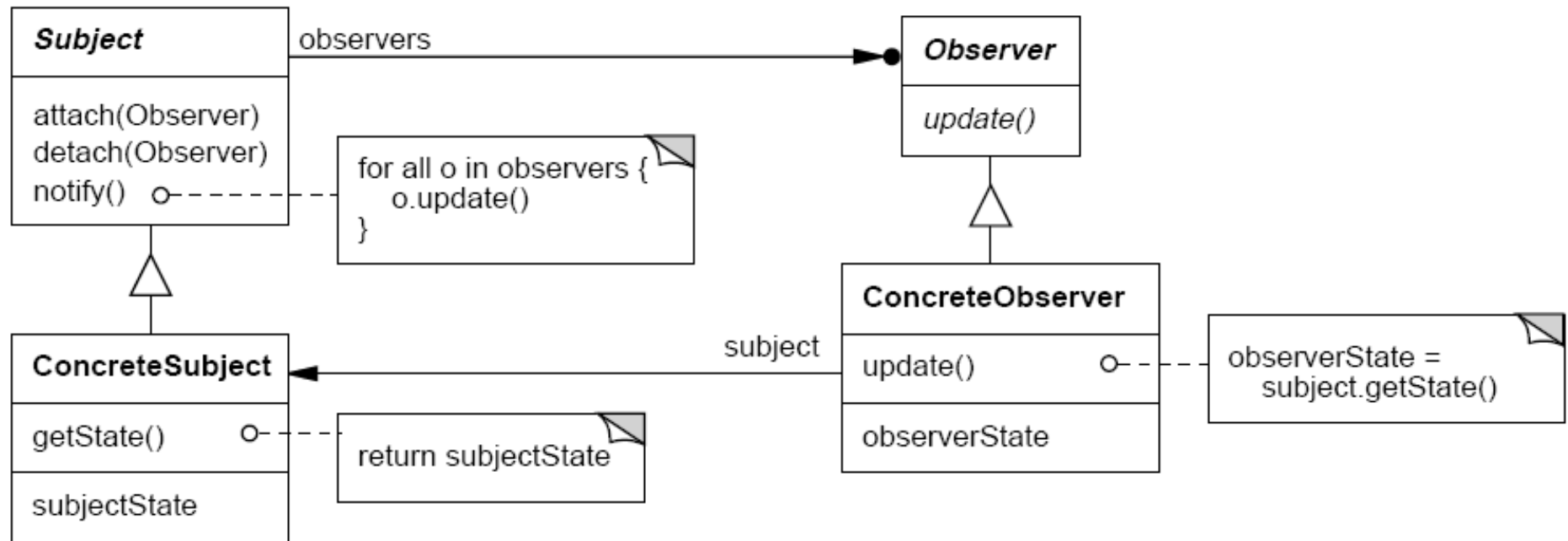
Observer Pattern

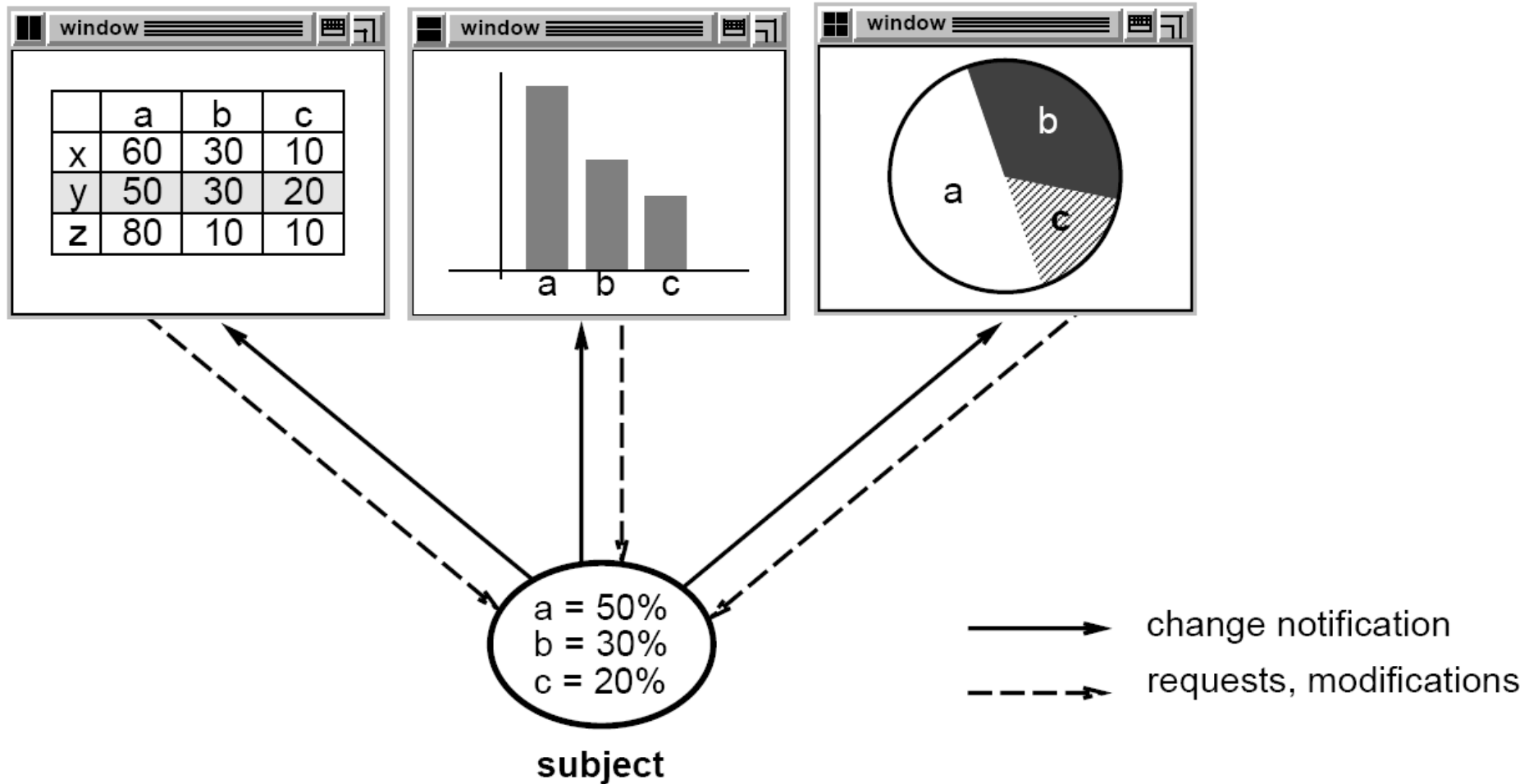- When the subject changes state, it notifies the interested Observers.

Ob1 Object

Observers

Subject Object

Ob2 Object

Ob3 Object

not Interested Object

Better Solution

Observer DP

Graph for Excel cells

observers

	a	b	c
x	60	30	10
y	50	30	20
z	80	10	10

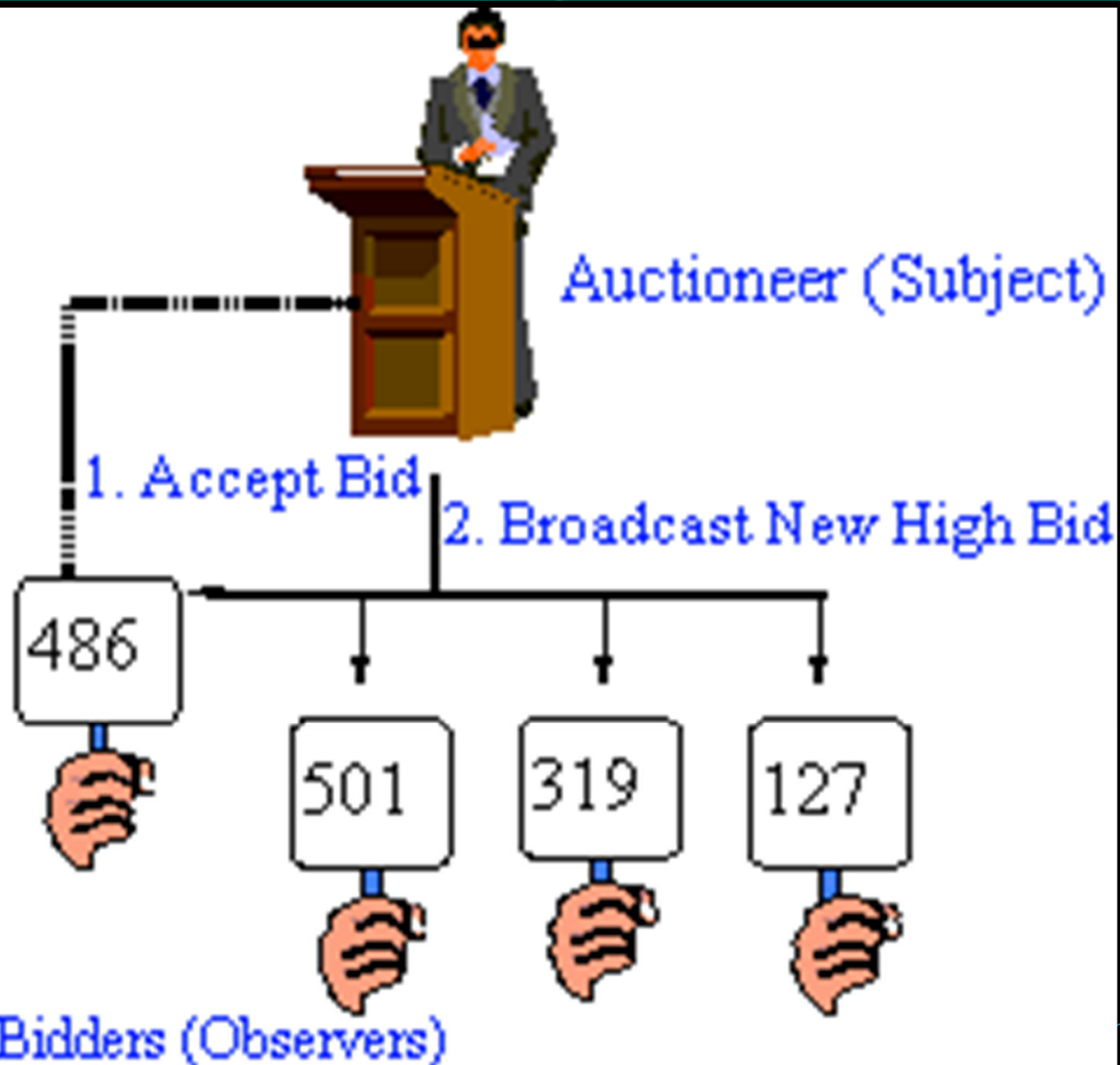a = 50%
b = 30%
c = 20%

subject

→ change notification

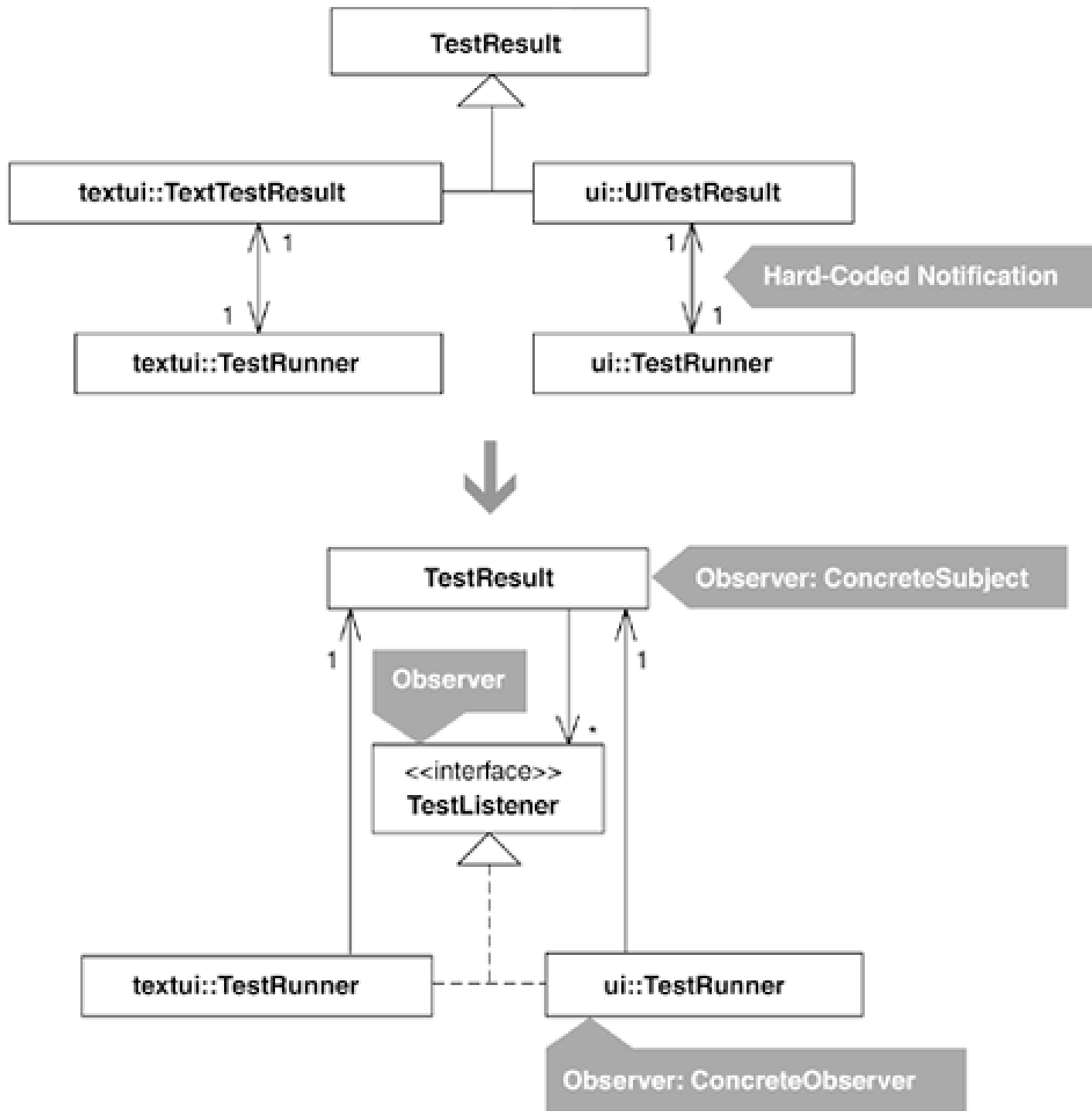⇢ requests, modifications

Real Life Analog

Uses of Observer pattern

- The Observer pattern is used heavily in JDK
  - In a GUI framework like Swing, we listen for events. The observer pattern is normally used to notify the interested parties about the events.

- On application exit, we want some processing to be done. Multiple exit Listeners can exist.

- In stock market, when a price reaches some level, we want certain actions to be taken.

Examples

- When a customer is added,
  - We need to send a welcome email
  - We need to verify the customer's address
- Also in a rich-client, the GUI thread (EDT) is separate from the Model thread.
  - The Observer can decouple the GUI logic from business Logic
- Real-life Observer Patterns
  - A radio station is broadcasting. Only the radios that are tuned in listen
  - A newspaper is publishing. Subscribers are getting the paper

TestResult

textui::TextTestResult | ui::UITestResult

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Hard-Coded Notification

1

textui::TestRunner | ui::TestRunner

TestResult — Observer: ConcreteSubject

1

Observer

1

<<interface>>
TestListener

textui::TestRunner | ui::TestRunner

Observer: ConcreteObserver

Replace hard coded notifications by Observer

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