

Activity 19-3: The Observer Pattern

Why?

The Observer pattern is a widely-used mid-level design element. It is an effective way to enable interaction between classes with minimal coupling.

Learning Objectives

- Understand the essence of the Observer pattern.
- Apply Observer pattern to a design problem.
- Understand strengths, limitations, and appropriate use of the Observer pattern.

Success Criteria

- Be able to distinguish Observer from other design patterns.
- Be able to describe the Observer pattern in UML
- Be able to create or modify a design based upon the Observer pattern.

Resources

ISED section 19.3

Vocabulary

Observer, subject, observable

Plan

1. Review *ISED* section 19.3 individually.
2. Answer the Key Questions individually, and then evaluate the answers as a team.
3. Do the Exercises as a team, and check your answers with the instructor.
4. Do the Problems and Assessment as a team.
5. Turn in the Problems and Assessment as a team deliverable.

Key Questions

1. What are the three key roles in the Observer pattern?
2. What language elements are provided in Java to support the Observer pattern?
3. When should the Observer pattern be used?
4. What are its limitations?

Exercises

1. Explain the differences between the Observer and Command patterns.
2. Write a UML sequence diagram to illustrate the activity associated with the AquaLush clock in Figure 19-3-4.

Problems (Deliverable)

1. Modify Figure 19-3-4 to include an AbstractSubject class that implements the Subject interface and serves as a super-class for Clock.
2. Write Java code to implement the Subject interface methods for AbstractSubject. Add any necessary data structures as well.
3. Modify the class diagram again. This time, add an AbstractClock superclass for Clock that has no super-class (other than Object). Change the design so that Clock can continue to use AbstractSubject methods.
4. Provide an analysis of your new design. How closely does it match the Observer pattern? What are its good and bad points?

Assessment (Deliverable)

1. What part of this activity helped you most to achieve the learning objectives?
2. How could the instructor modify this activity to improve learning?