CSSE 220 Day 25

Strategy Pattern, Search, Mobile Game Development

Checkout *TextTwisterMIDlet* project from SVN

Questions

Strategy Design Pattern

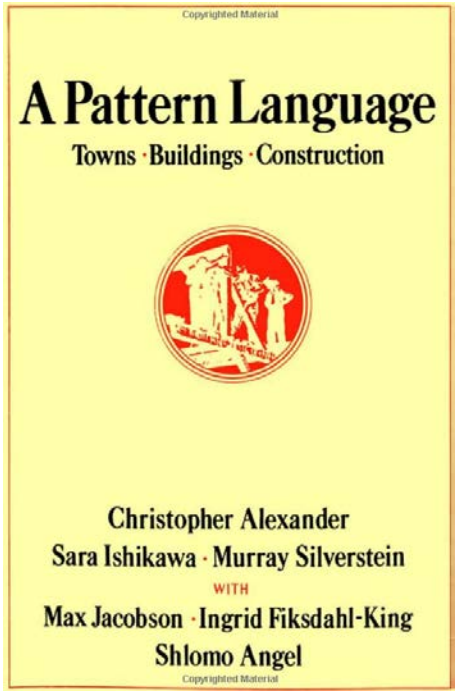
- An application of function objects

Design Pattern

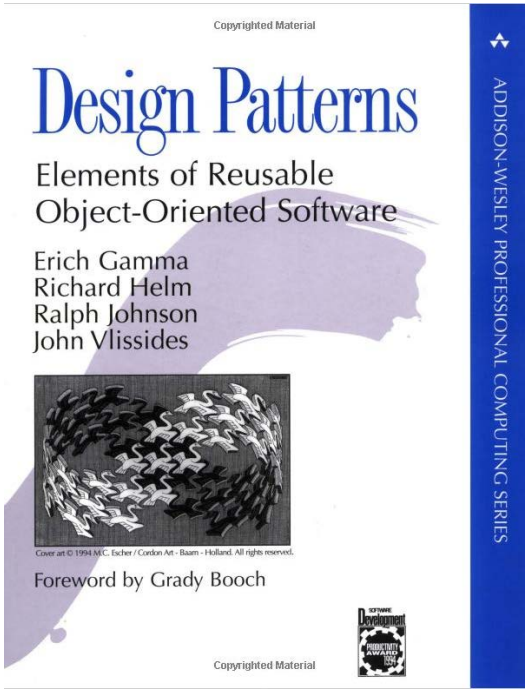
- A *named* and *well-known* problem-solution pair that can be applied in a new context.

History

1977



2004

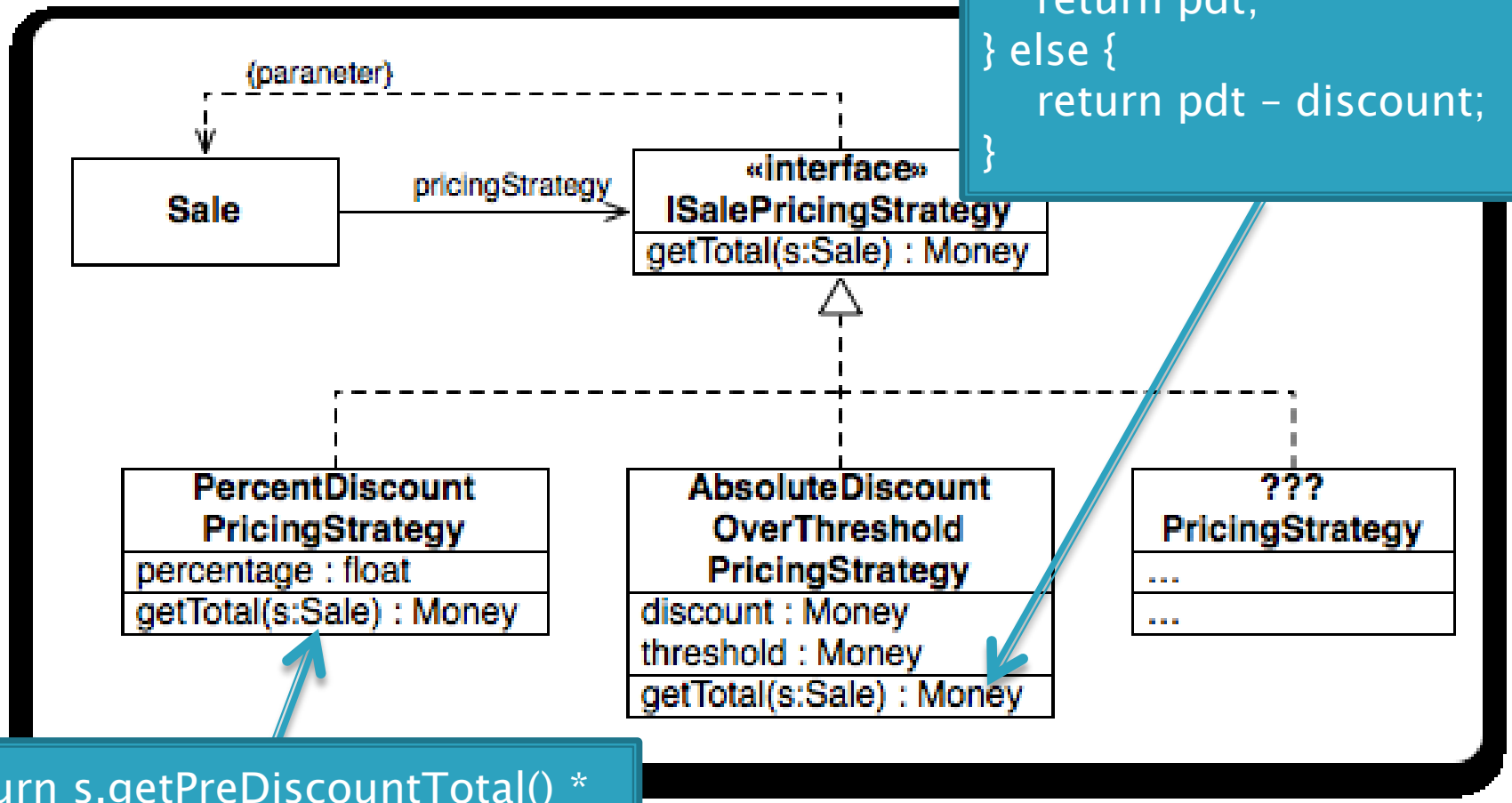


Strategy Pattern

- **Problem**: How do we design for varying, but related, algorithms or policies?

- **Solution**: Define each algorithm or policy in a separate class with a common interface

Strategy Example




```
double pdt =
s.getPreDiscountTotal();
if (pdt < this.threshold) {
    return pdt;
} else {
    return pdt - discount;
}
```

```
return s.getPreDiscountTotal() *
    this.percentage;
```

Search Review

- Linear vs. Binary Search

Searching

- Consider:
  - Find Cary Laxer's number in the phone book
  - Find who has the number 232-2527
- Is one task harder than the other? Why?
- For searching unsorted data, what's the worst case number of comparisons we would have to make?

Binary Search of Sorted Data

- A divide and conquer strategy

- Basic idea:
  - Divide the list in half
  - Decide whether result should be in upper or lower half
  - Recursively search that half

Analyzing Binary Search

- What's the best case?
- What's the worst case?

J2ME and MIDlet

- A technology for mobile development

J2ME Development

- J2ME
  - Java Platform, Micro Edition or Java ME
  - Java platform designed for embedded systems
  - Target devices
    - industrial controls
    - mobile phones
  - Java ME devices implement a *profile*.
    - e.g., MIDP

J2ME MIDlet Development

- J2ME
  - Library is limited in many respects
    - No Collections like ArrayLists!
  - Need to install a Java Wireless Toolkit
  - Can configure Eclipse for J2ME development

What is a MIDlet

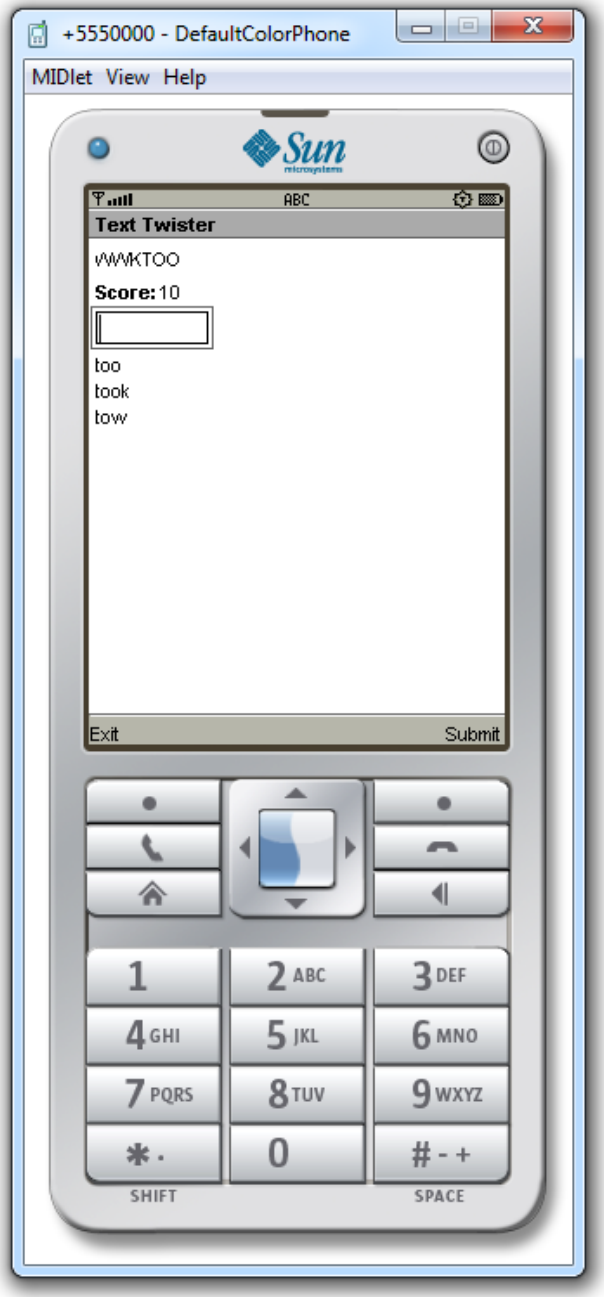
- Application that uses the (MIDP) of the (CLDC) for the J2ME environment.
- There are three possible states in a MIDlet's life-cycle:
  - *paused* – The MIDlet instance has been constructed and is inactive.
  - *active* – The MIDlet is active.
  - *destroyed* – The MIDlet has been terminated and is ready for reclamation by the garbage collector.

A sample MIDlet application

```
public class MyMIDlet extends MIDlet {
    public MyMIDlet() { }

    // Called when MyMIDlet is constructed or
       restarted
    public void startApp() { }

    // Called to pause the MyMIDlet
    public void pauseApp() { }

    // Called to terminate the MyMIDlet
    public void destroyApp(boolean unconditional) { }
}
```

Your assignment

- Represent search algorithms using strategy pattern in TextTwisterMIDlet


+5550000 - DefaultColorPhone
MIDlet View Help
Sun
ABC
Text Twister
vWWKTOO
Score: 10
too
took
tow
Exit
Submit
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
* .
0
- +
SHIFT
SPACE

Game description

- The game Text Twister is a word-building game where the user is given a 6-letter word with the letters scrambled.
- In order to get to the next level of the game, the user must unscramble the 6-letter word.
  - A user can also gain bonus points by creating 3-, 4, and 5-letter words with the letters provided.

Problem Description

- Only scrambled 6-letter words will be included in the implementation.
- You might want to extend this game to include 8-letter words.
  - 8-letter words will require a larger number of (3-, 4-, 5-, 6-, 7-letter) words to be searched.
  - When the search space increases, the search algorithm will need to made more efficient.
  - http://grecni.com/texttwist.php generates all the combinations for an n-letter word

Details are in HW25

- Install the J2ME, read the TextTwister
- Work with your Loderunner team