Tetris

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Design Patterns

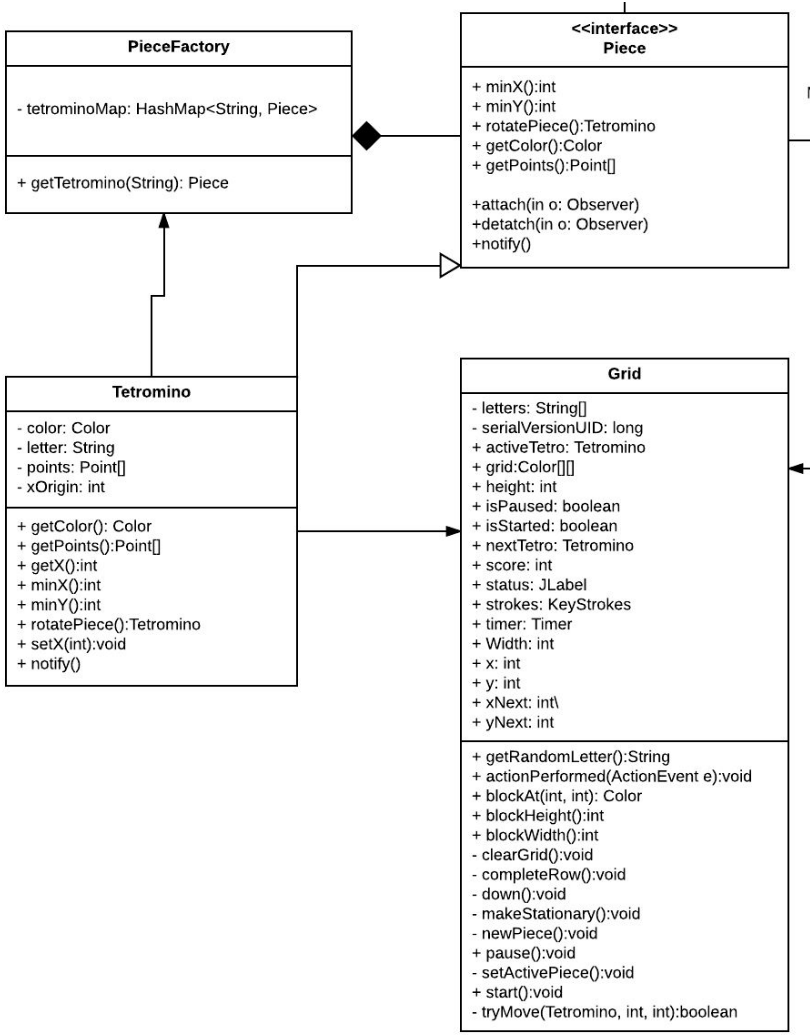
Flyweight:

- Generating Tetrominoes (L, J, I, O, Z, S)
- Managing piece actions (rotation, side-to-side, down)
- Storing stationary pieces

Observer:

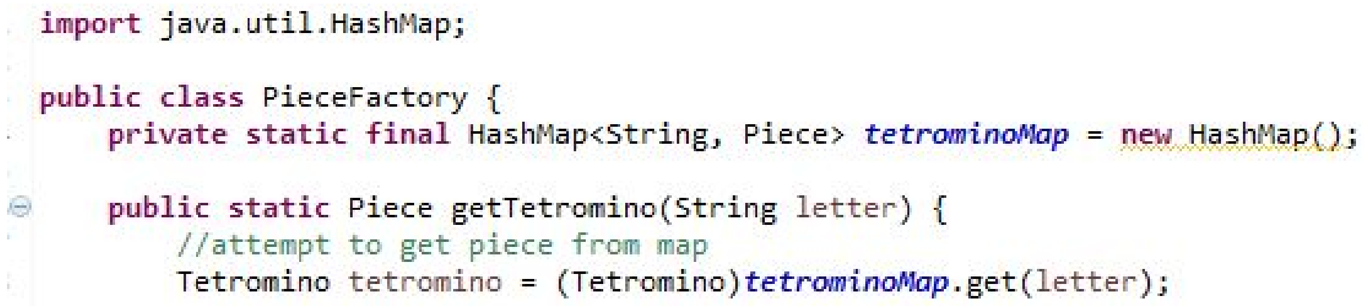
- For active piece (Tetromino) add a listener for arrow key strokes
- Update game accordingly

Flyweight: Class Diagram



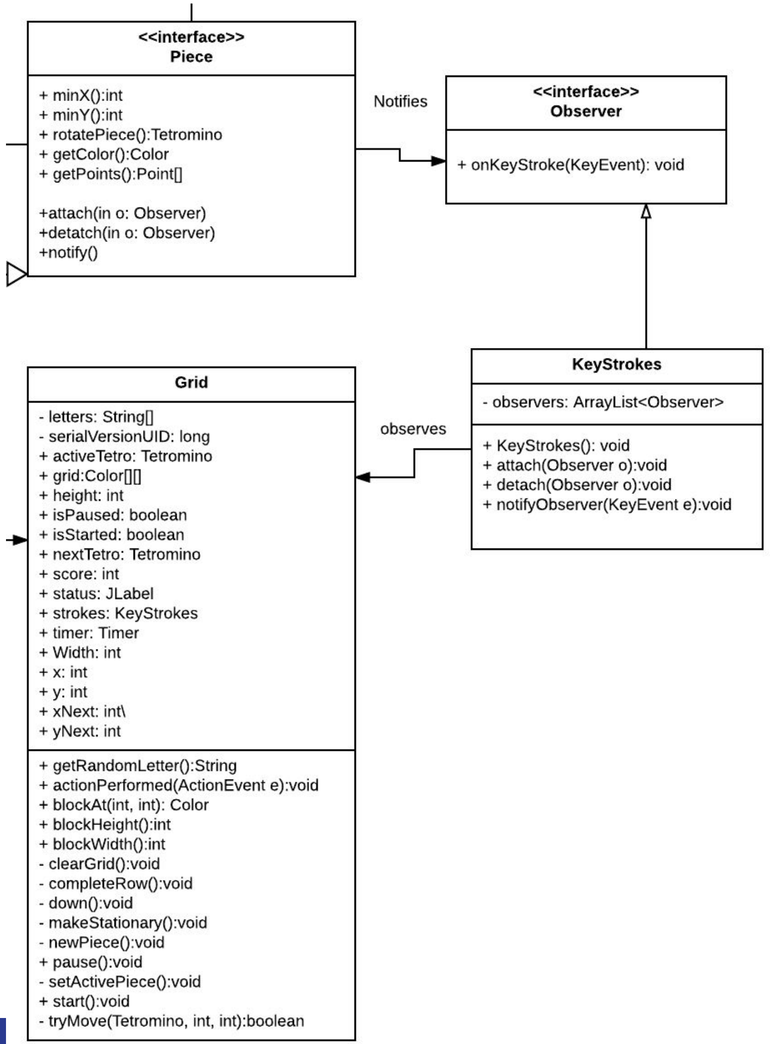
Flyweight: Implementation

- Piece interface
- Concrete class Tetromino implementing the Piece interface
- Piece Factory for generating Tetrominoes
- Grid class acts as client



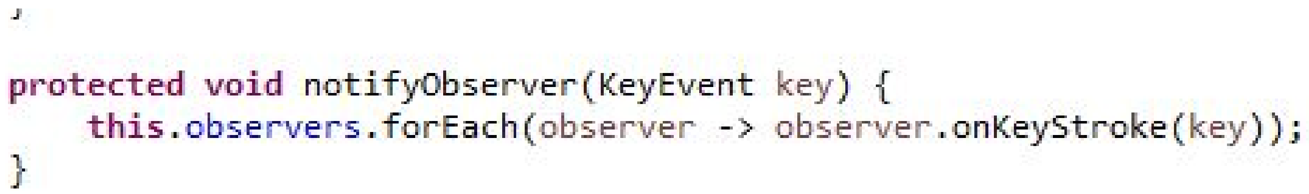
```
import java.util.HashMap;

public class PieceFactory {
    private static final HashMap<String, Piece> tetrominoMap = new HashMap();

    public static Piece getTetromino(String letter) {
        //attempt to get piece from map
        Tetromino tetromino = (Tetromino)tetrominoMap.get(letter);
```

Observer: Class Diagram



Observer: Implementation

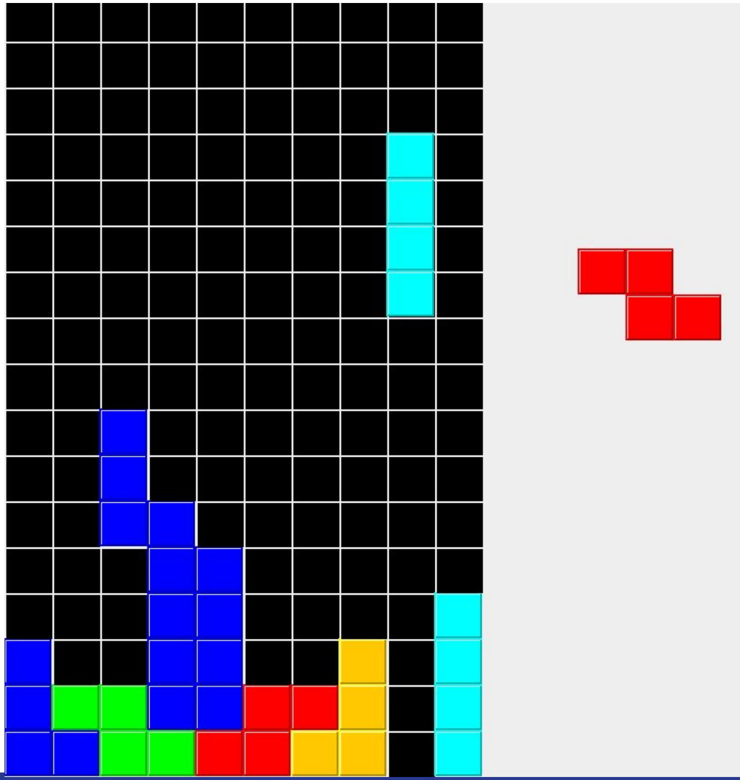
- Observer Interface - Subscriber
- KeyStroke Class - Publisher (subject)
- Tetromino Class - Concrete Subject
- Grid Class - Concrete Observer



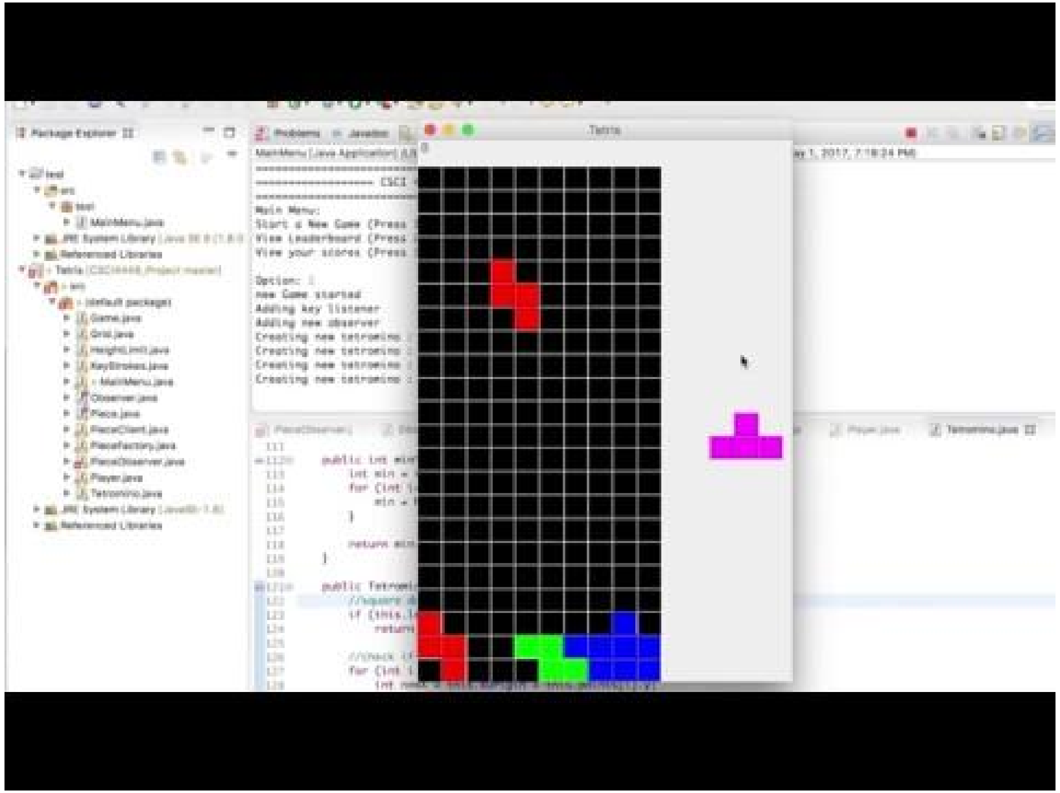
```
protected void notifyObserver(KeyEvent key) {
    this.observers.forEach(observer -> observer.onKeyStroke(key));
}
```

Use Case UC-04 - View Next Piece

User can view the next piece that will be active.



Sped Up Demo



```
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Main Menu:
Start a New Game (Press
View Leaderboard (Press
View your scores (Press

Option: 1
new Game started
Adding key listener
Adding new observer
Creating new tetromino
Creating new tetromino
Creating new tetromino
Creating new tetromino
```

```
    public int min
        int min =
        for (int i
            min =
        }

        return min
    }

    public Tetromi
        //square
        if (this.l
            return

        //check
        for (int i
            int newX = this.origin + this.pos[i].y;
```

Full Length Demo

Must be logged in with @Colorado.edu email:

https://drive.google.com/a/colorado.edu/file/d/0B2qaf1NOE-VIRkd3Q2UtZnh3OFU/view?usp=sharing