Refactoring via Program Slicing and Sliding

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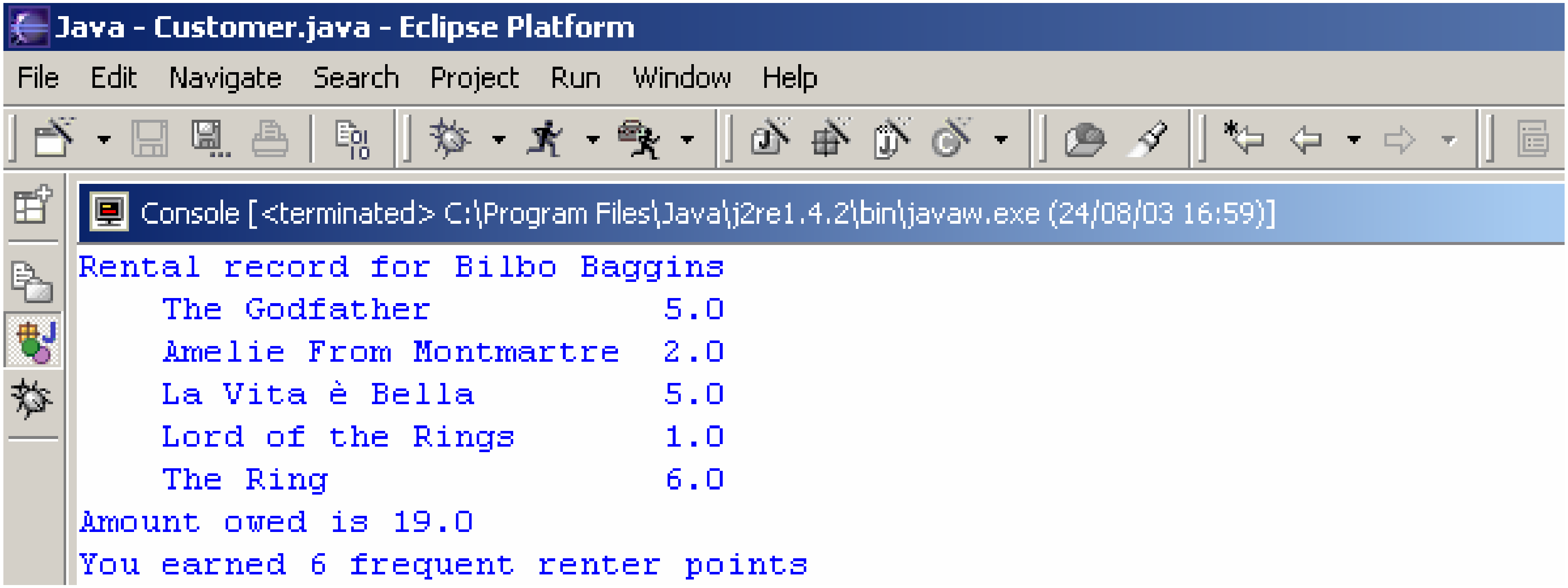
Refactoring enables
iterative and incremental
software development

The gap:

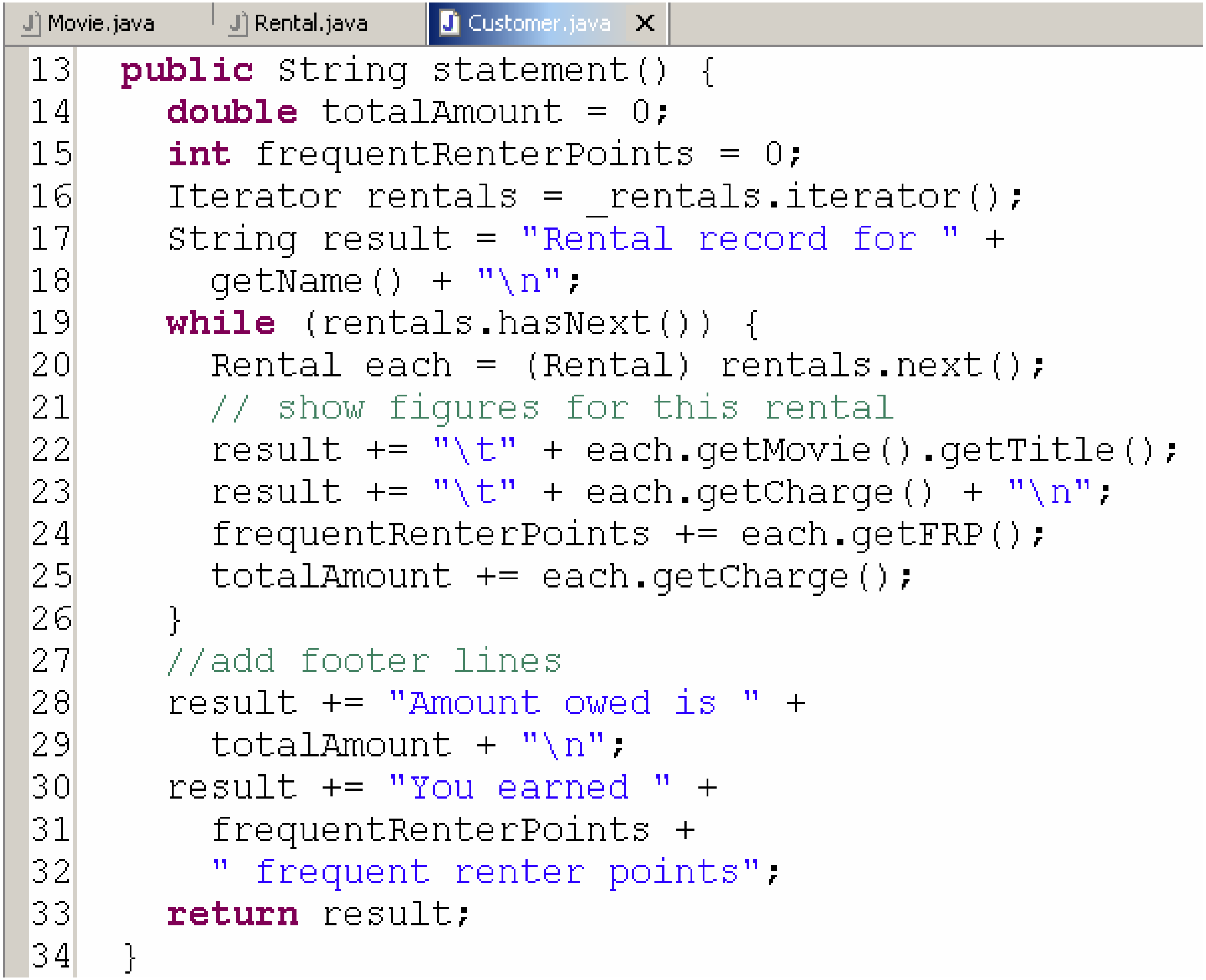
Refactoring tools are important but weak

Example: Fowler’s video-store

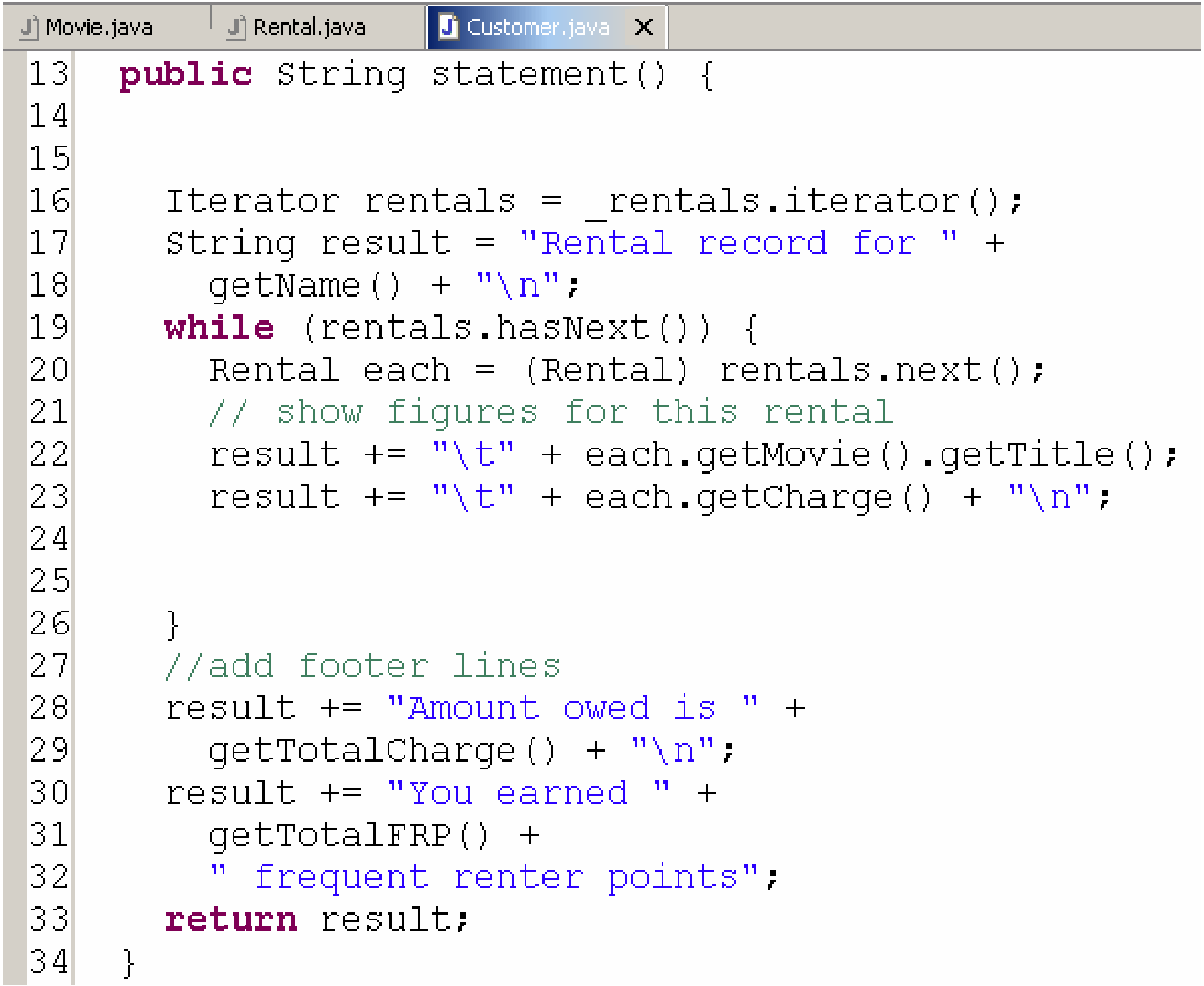


Console [<terminated> C:\Program Files\Java\j2re1.4.2\bin\javaw.exe (24/08/03 16:59)]

```
Rental record for Bilbo Baggins
	The Godfather	5.0
	Amelie From Montmartre	2.0
	La Vita è Bella	5.0
	Lord of the Rings	1.0
	The Ring	6.0
Amount owed is 19.0
You earned 6 frequent renter points
```



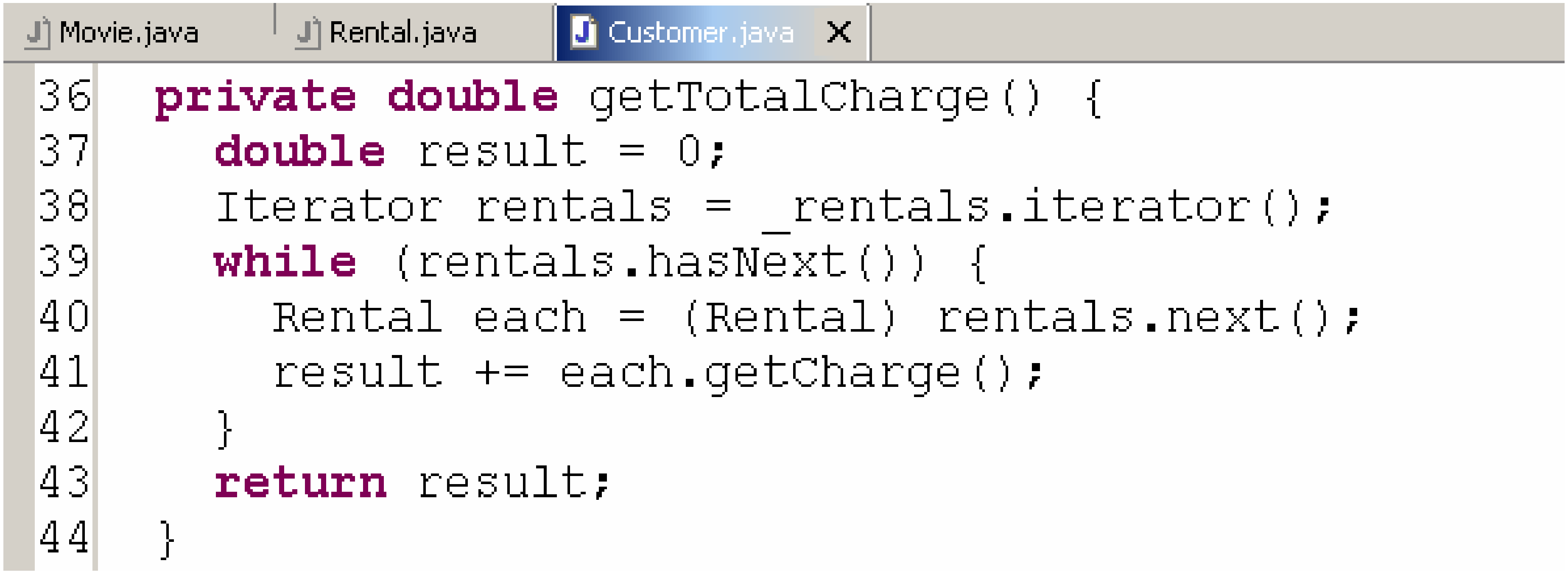
```
  public String statement() {
    double totalAmount = 0;
    int frequentRenterPoints = 0;
    Iterator rentals = _rentals.iterator();
    String result = "Rental record for " +
      getName() + "\n";
    while (rentals.hasNext()) {
      Rental each = (Rental) rentals.next();
      // show figures for this rental
      result += "\t" + each.getMovie().getTitle();
      result += "\t" + each.getCharge() + "\n";
      frequentRenterPoints += each.getFRP();
      totalAmount += each.getCharge();
    }
    //add footer lines
    result += "Amount owed is " +
      totalAmount + "\n";
    result += "You earned " +
      frequentRenterPoints +
      " frequent renter points";
    return result;
  }
```



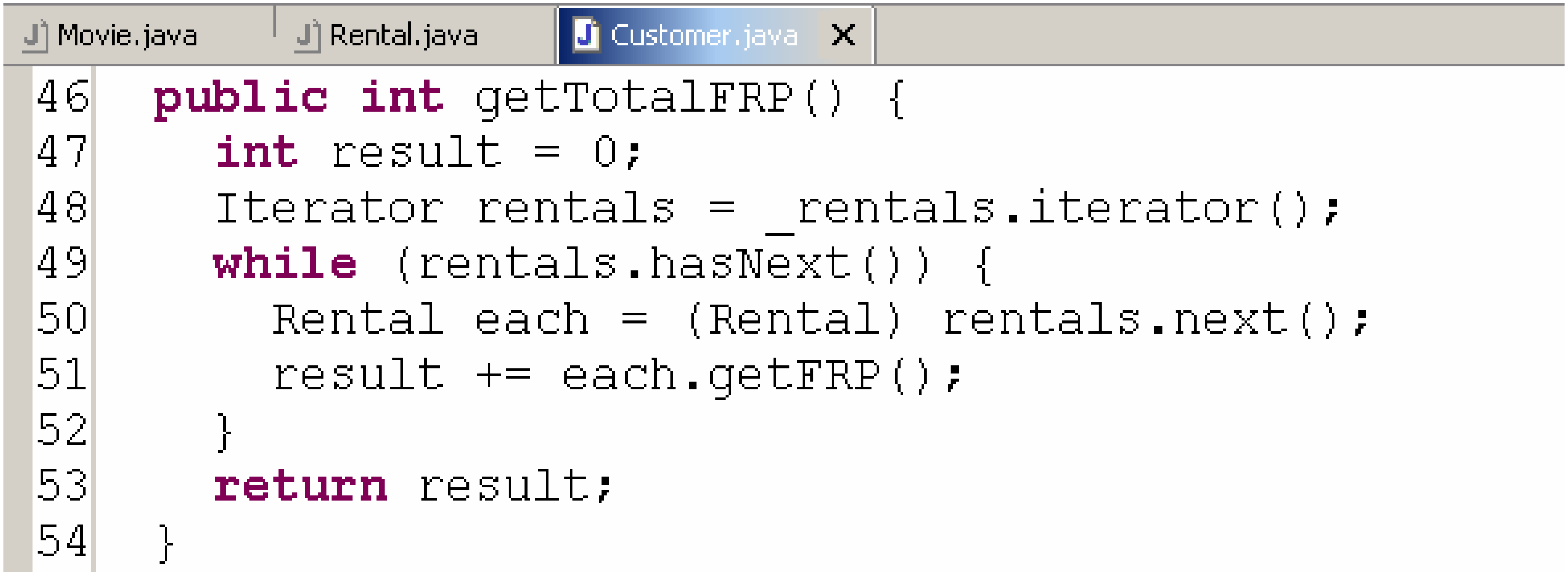
```
public String statement() {


  Iterator rentals = _rentals.iterator();
  String result = "Rental record for " +
    getName() + "\n";
  while (rentals.hasNext()) {
    Rental each = (Rental) rentals.next();
    // show figures for this rental
    result += "\t" + each.getMovie().getTitle();
    result += "\t" + each.getCharge() + "\n";


  }
  //add footer lines
  result += "Amount owed is " +
    getTotalCharge() + "\n";
  result += "You earned " +
    getTotalFRP() +
    " frequent renter points";
  return result;
}
```



```java
private double getTotalCharge() {
  double result = 0;
  Iterator rentals = _rentals.iterator();
  while (rentals.hasNext()) {
    Rental each = (Rental) rentals.next();
    result += each.getCharge();
  }
  return result;
}
```



```java
public int getTotalFRP() {
  int result = 0;
  Iterator rentals = _rentals.iterator();
  while (rentals.hasNext()) {
    Rental each = (Rental) rentals.next();
    result += each.getFRP();
  }
  return result;
}
```

Programmers use slices when refactoring

Challenge:

Automatic slice-extraction

Approach:

Program Sliding

Live sliding examples…

Potential implications of slides and sliding:

Refactoring and beyond

Thanks!