Exercise 1.1 – 1.4
Classes

Excercice 1.1

Develop a program that assists bookstore employees.

- For each book, the program should track the book's title, its price, its year of publication, and the author's name, …

- Develop an appropriate class diagram (by hand) and implement it with a class.

- Create instances of the class to represent these three books:
    1. Daniel Defoe, *Robinson Crusoe*, $15.50, 1719;
    2. Joseph Conrad, *Heart of Darkness*, $12.80, 1902;
    3. Pat Conroy, *Beach Music*, $9.50, 1996.
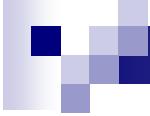
Exercise 1.2

- Add a constructor to the following partial class definition and draw the class diagram

```
// represent computer images
class Image {
    int height; // pixels
    int width;  // pixels
    String source; // file name
    String quality; // informal
}
```

- Explain what the expressions mean in the problem context and write test class:
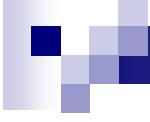
```
new Image(5, 10, "small.gif", "low")
new Image(120, 200, "med.gif", "low")
new Image(1200, 1000, "large.gif", "high")
```

Exercise 1.3
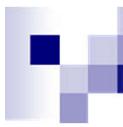
- Translate the class diagram in figure into a class definition. Also create instances of the class

Automobile
- String model - int price [in dollars] - double mileage [in miles per gallon] - boolean used

Exercises 1.4

- Write Java class, constructor and test constructor for representing points in time since midnight.
  A point in time consists of three numbers: hours, minutes, and seconds.

Exercises 1.5 – 1.8
Object Containment
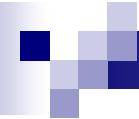
Exercise 1.5

Develop a "real estate assistant" program.
The "assistant" helps the real estate agent locate houses of interest for clients. The information about a house includes its kind, the number of rooms, the asking price, and its address. An address consists of a house number, a street name, and a city.
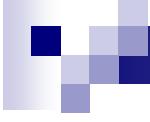
Represent the following examples using your classes:

- Ranch, 7 rooms, $375,000, 23 Maple Street, Brookline
- Colonial, 9 rooms, $450,000, 5 Joye Road, Newton
- Cape, 6 rooms, $235,000, 83 Winslow Road, Waltham

Exercise 1.5: Note

- **Ranch**: A ranch is a large farm used for raising animals, especially cattle, horses or sheep.

- **Colonial**: A colonial building or piece of furniture was built or made in a style that was popular in American in the 17th and 18th centuries.

- **Cape**: A cape is a large piece of land that sticks out into the sea from the coast.

Exercise 1.6
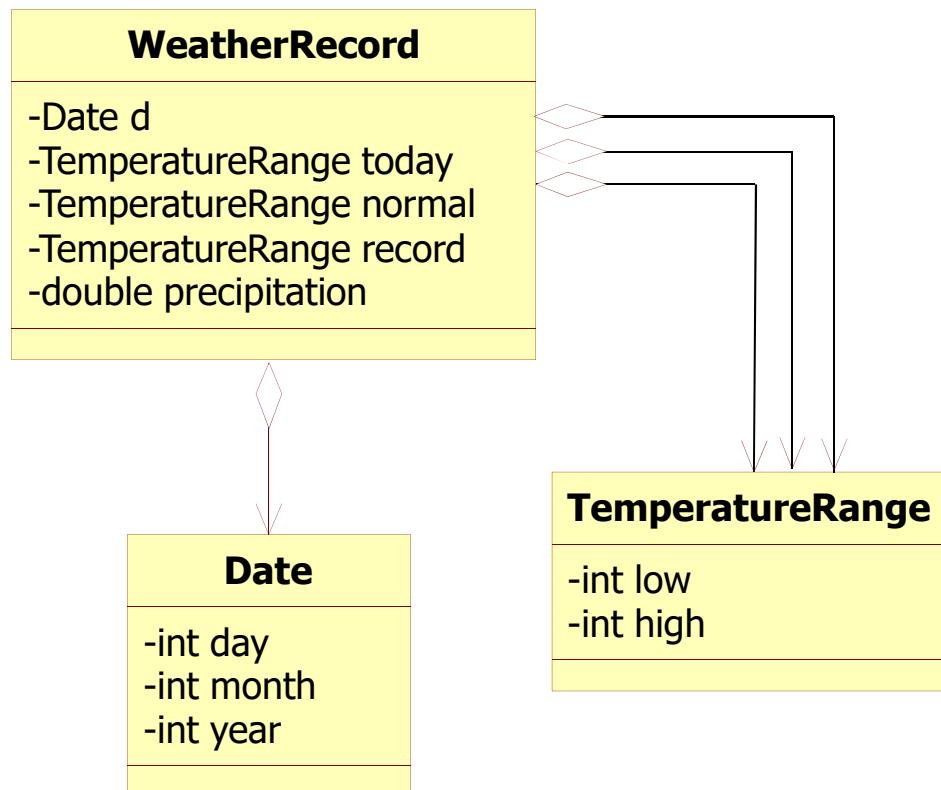
Develop a program that assists bookstore employees.
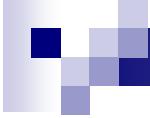
For each book, the program should track the book's title, its price, its year of publication, and the author.

A author has a name and birth year.

Exercise 1.7

- Provides the data definition for a weather recording program.

WeatherRecord

-Date d
-TemperatureRange today
-TemperatureRange normal
-TemperatureRange record
-double precipitation

Date

-int day
-int month
-int year

TemperatureRange

-int low
-int high

Exercise 1.8: Extended Exercises

Develop a program that can assist railway travelers with the arrangement of train trips.

- The available information about a specific **train** includes its schedule, its route, and whether it is local.

- The route information consists of the origin and the destination station.

- A schedule specifies the departure and the arrival (clock) times when the train leaves and when it arrives.

- ClockTime consists of the hour (of the day) and the minutes (of the hour).

Class Diagram