

Exercise 1.1 – 1.4

Classes

Exercice 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
<ul style="list-style-type: none">- 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

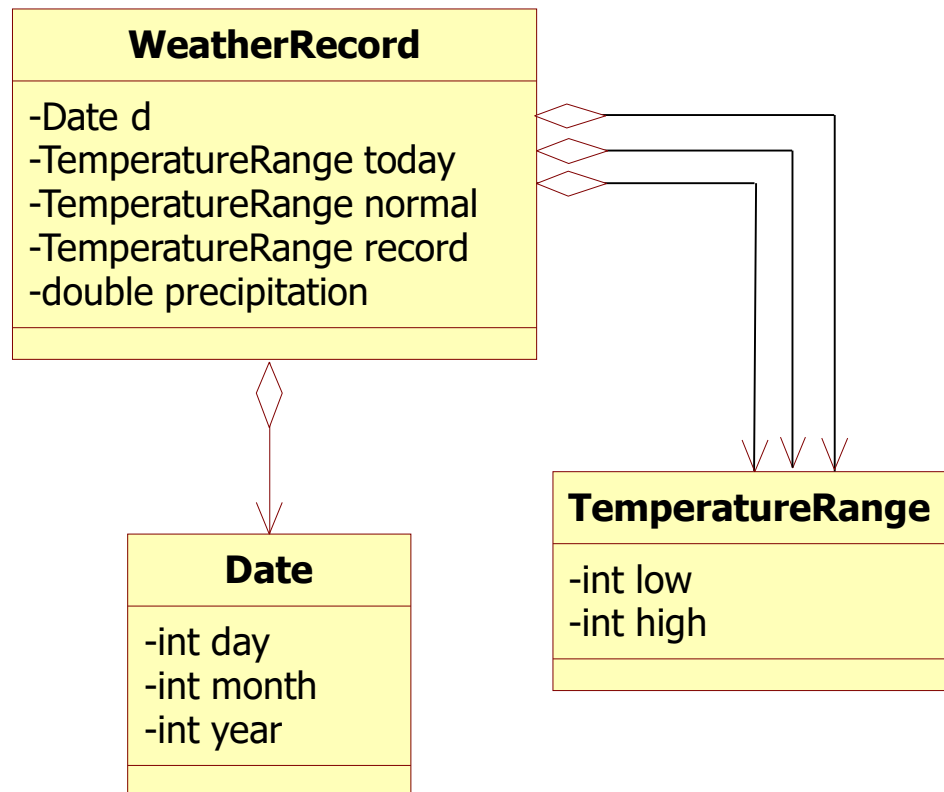
- **Ranch**: A ranch is a large farm used for raising animals, especially cattle, horses or sheep.
- **Colonial**: A colonial building or piece of furniture was built or made in a style that was popular in American in the 17th and 18th centuries.
- **Cape**: A cape is a large piece of land that sticks 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.



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

