Objects and class

In this chapter

4.1 Introduction to Object-Oriented Programming

4.1.1 Classes

Some Definition:

- **class**: blueprint
- **instance** : **construct** an object from a class

Key concept in working : **Encapsulation**(information hiding): **data+behavior** in on package and *hiding* the implementation details.

- **instance fields**: The bits of data in an object
- **method** : the procedures that operate on the data.
- **current state** : a specific instance with the data specific in instance fields.

Never directly access instance fields in a class other than their own.

- Object : Classes being built by extending other classes.
- **inheritance** : built class by extending, adding methods and instance fields of our own.

4.1.2 Objects

Three Key Characteristics of objects:

- **Behavior**
- **State**
- **Identity**

4.1.3 Identifying Classes

Different from the procedural program, the OOP often begins with identify your classes and then add methods to each class. Likes nouns and verbes.

4.1.4 Relationships between Classes

- **Dependence**: A use-a B
- **Aggregation**: A has a B
- **Inheritance**: A is a B

Dependence

The dependence is the most common relationship between classes. For example order uses Account for checking credit status.

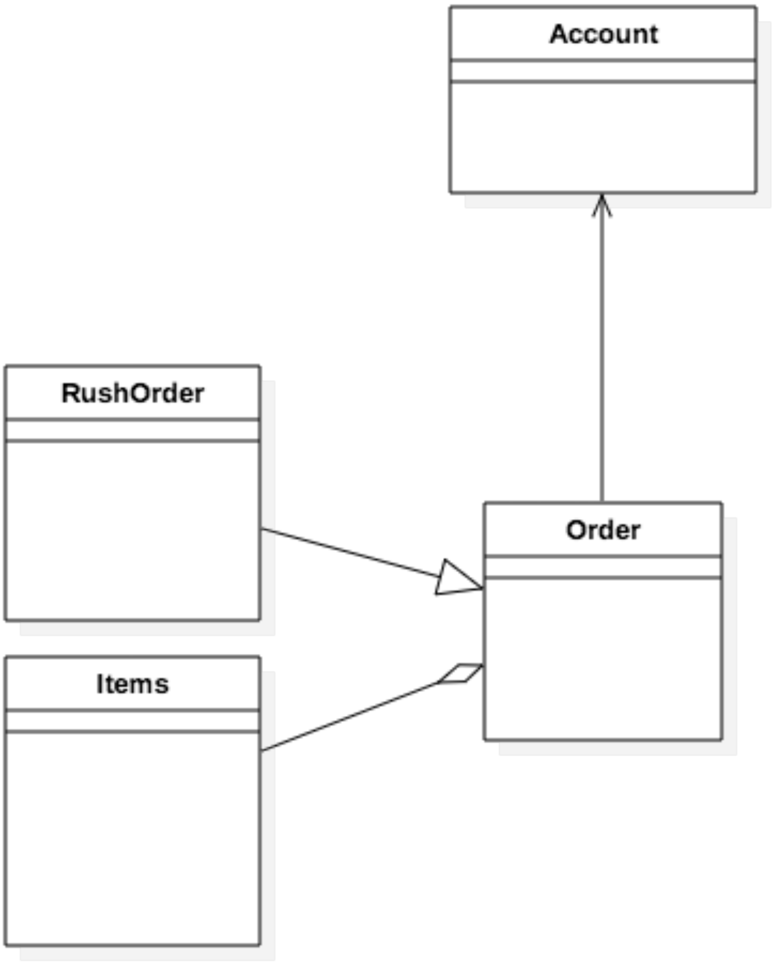
Minimise coupling : Our goal is sometimes minimise the dependences between classes, so that any change to B will not influence A.

Aggregation

Containment means that objects of class A contain objects of classB, for example, Order contains Items.

Inheritance

The is the relationship between a more special and a more general class. For example a *RushOrder* class inherits from an *Order* class.



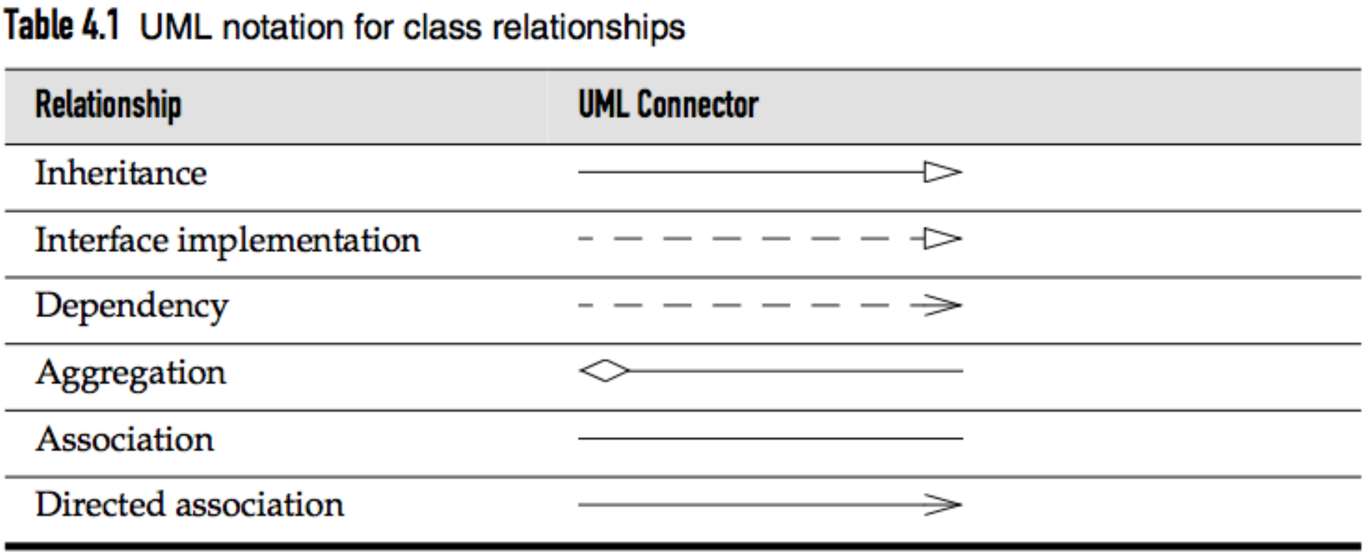


Table 4.1 UML notation for class relationships

Relationship	UML Connector
Inheritance	———▷
Interface implementation	- - - - - - - -▷
Dependency	- - - - - - - ->
Aggregation	◇———
Association	———
Directed association	———>

4.2 Use Predefined Class

4.2.1 Objects and Object Variables

- Constructor : to construct new instances

- Apply a method to object
- Object variable
- inferto no object

```
new Date();
String s =new Date().toString();
Date deadline; //Object Variable
deadline = null;
```

4.2.2 The LocalDate Class of the Java Library

On using Date, the time is represented by the number of milliseconds from a fixed point : **epoch 00:00:00 UTC, January 1, 1970**

- UTC: Coordinated Universal Time
- GMT: Greenwich Mean Time.

Factory Methods : LocalDate.now() constructs a new object that represents the date at which the object was constructed.

The LocalDate Class encapsulated instance fields to maintain the date to which it is set.

```
LocalDate.now();
LocalDate.of(1999,12,31);
LocalDate newYearsEve = LocalDate.of(1999, 12, 31);
int year = newYearsEve.getYear(); // 1999
int month = newYearsEve.getMonthValue(); // 12
int day = newYearsEve.getDayOfMonth(); // 31

LocalDate aThousandDaysLater = newYearsEve.plusDays(1000); //1000 days after

year = aThousandDaysLater.getYear(); // 2002
month = aThousandDaysLater.getMonthValue(); // 09
day = aThousandDaysLater.getDayOfMonth(); // 26
```

4.2.3 Mutator and Accessor Methods

```
LocalDate aThousandDaysLater = newYearsEve.plusDays(1000);
```

The original object remains unchanged. We say that the plusDays method **does not mutate the object** on which it is invoked.

```
GregorianCalendar someDay = new GregorianCalendar(1999, 11, 31); // Odd feature of that cla
someDay.add(Calendar.DAY_OF_MONTH, 1000);
```

The add() is a **mutator method**.

- Mutator method: Access and Modified Object.
- Accessor Method: Access without Modify.