Class 2: Inheritance

CO871

1 Introduction

These exercises are about inheritance.

2 Polymorphic types

Solutions for the following questions will become available on moodle after the end of the PC class.

Assume that you have four classes: Person, Instructor, Student and PhDStudent. Instructor and Student are both subclasses of Person. PhDStudent is a subclass of Student.

Which of the following assignments are legal and why?

```
Person p1 = new Student();         // Correct
Person p2 = new PhDStudent();      // Correct
PhDStudent phd1 = new Student();   // Error. Cannot assign supertype on a subtype.
Instructor i1 = new Person();      // Error. Cannot assign supertype on a subtype.
Student s1 = new PhDStudent();     // Correct

s1 = p1;    // Error.
s1 = p2;    // Error.
p1 = s1;    // Correct.
i1 = s1;    // Error.
s1 = phd1;  // Correct.
phd1 = s1;  // Error.
```

3 An inheritance hierarchy

Assume that you have four classes - O, X, T and M - and a variable of each:

```
O o;
X x;
T t;
M m;
```

Assume that the following assignments are all legal:

```
m = t;
m = x;
o = t;
```

Assume that the following assignments are all illegal:

```
o = m;
o = x;
x = o;
```

What can you say about the relationships of these classes; i.e., which classes are a subclass or a superclass of which others?

Answer: M is superclass. O extends M. X extends M. T extends O

4 Remaining class

Check the links on moodle with the example solutions.