

Java Review

(Object Oriented Programming)



CPSC 319 - Data Structures

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Outline

- ▷ Setup (JDK, IntelliJ IDEA)
- ▷ Introduction to Object Oriented
- ▷ Encapsulation
- ▷ Inheritance
- ▷ Practice

Setup

▷ Installing JDK

- Linux: default-jdk
- Windows: Download from Oracle.com, Install, Change PATH
- MAC: Download from Oracle, Install

Coding Time

- ▷ Hello World! in Java
- ▷ Running with command line

IDE

- ▷ IntelliJ IDEA (My Favourite)
- ▷ Eclipse
- ▷ NetBeans

Coding Time

- ▷ Hello World in IntelliJ

Introduction to Object Oriented

- ▷ Everything is Object
- ▷ An Object is a instance of a class
- ▷ Classes have
 - Fields, data fields, class scope variables, etc. used to provide data specification
 - Methods which are functions operating on these data and possibly on the data belonging to other class instances

Encapsulation

- ▷ Direct access to fields may cause a lot of problems
- ▷ The combination of the data and related operations on them is called data encapsulation.

Coding Time

- ▷ Person Class
- ▷ Constructor
- ▷ Getter and Setter
- ▷ Naming Convention

Inheritance

- ▷ A new class can be derived from an existing class whereby the new class automatically includes (inherits) fields and methods of the existing class. The former is called a subclass or derived class, the latter is called a superclass or base class.

Inheritance

variable **d** and method **g()** are inherited

establish inheritance

```
class C1 {  
    int n;  
    double d;  
    void f(int m) {  
        . . .  
    }  
    double g(double x) {  
        . . .  
    }  
}
```

```
class C2 extends C1 {  
    int n;  
    double y = g(d);  
    void f(int m) {  
        . . .  
    }  
    double h(double x) {  
        super.n = 10;  
        return n * x;  
    }  
}
```

C2's variable **n**,

C1's variable **n** is
still accessible

method **f()** is redefined

method **h()** is newly defined
and so is variable **y**

Coding Time

- ▷ Employee and Manager
 - salary, vacationDays, hours
- ▷ super() method
- ▷ toString() method

Practice

- ▷ Write an Employee subclass Secretary. A Secretary makes 20,000 more than an Employee and have 5 more vacation days. Additionally, the class Secretary should have a new method called “scheduleMeeting” that prints “Your meeting starts in 10 minutes...”.
- ▷ Use the super keyword to interact with the Employee superclass as appropriate.
- ▷ Use the class testInheritance to test your work.