

Object-Oriented Programming Inheritance

Ewan Klein

Inf1 :: 2008/09

- Chapters 7 – 9 of *Head First Java*.
- Central to whole business of OOP.
- We'll take it slowly.

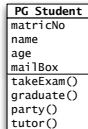
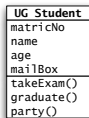
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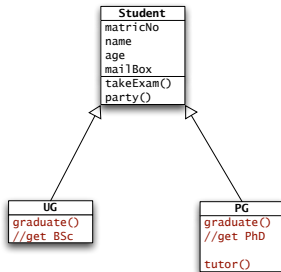
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Classes with Stuff in Common



- UML diagram: class name, instance variables, methods.

Abstracting Common Stuff



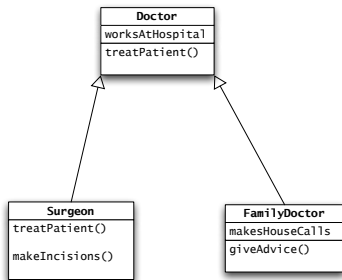
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Object-Oriented Programming/inheritance

- Subclass (e.g. UG) **inherits** from superclass (e.g. Student).
- In Java: subclass **extends** superclass.
- So subclass gets all the members — instance variables and methods — of superclass.
- Also:
 - subclass can add new members of its own; and
 - **override** inherited methods.



```

Doctor
public class Doctor {
    boolean worksAtHospital;
    void treatPatient() {
        // perform a checkup
    }
}
  
```

```

Surgeon
public class Surgeon extends Doctor {
    void treatPatient() {
        // perform surgery
    }
    void makeIncisions() {
        // use a scalpel
    }
}
  
```

- NB We put this class into a new file Surgeon.java

FamilyDoctor

```
public class FamilyDoctor extends Doctor {
    boolean makesHouseCalls;
    void giveAdvice() {
        // tells you to wrap up warmly
    }
}
```

- 1 Look for objects that have common attributes and behaviours.
- 2 Design a class that represents the common state and behaviour.
- 3 Decide if a subclass needs method implementations that are specific to that particular subclass type.
- 4 Carry out further abstraction by looking for groups of subclasses that might have common behaviours.

X IS-A Y?

Quiz!!

- ClassX extends ClassY
 - Can we say that ClassX IS-A ClassY?
 - That is, an instance of ClassX can do anything (and maybe more) that an instance of ClassY can do?
- 1 Kitchen extends Room
 - 2 Room extends House
 - 3 Violinist extends Musician
 - 4 Sink extends Kitchen
 - 5 Musician extends Person
 - 6 Madonna extends Singer
 - 7 Soprano extends Musician

- Short Quiz to do in class.
- Covers material in HFJ and lectures.
- To give me feedback on how you are doing.
 - Don't need to put your name.
 - Please leave completed sheets with me or at top of room before you depart.

- Read Chapter 7 of *Head First Java*.
- More on Inheritance on Friday.
- NB First OOP Lecture next week is **Monday 16th February** at 2.00 pm
— swapped with D&A Slot.