Chapter 6: Inheritance EECS 1030

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# Thanks for taking the time to fill it out.

Students ask questions in class (or online)

- 5 > 75% of the time
- 8 50-75% of the time
- 4 25-50% of the time
- 2 < 25% of the time

Feel free to ask more questions

The pace of the lectures is appropriate

- 15~~>75% of the time
- 1 50-75% of the time
- 3 25-50% of the time
- 1~~<25% of the time

The complexity of the material is appropriate

- 8~~>75% of the time
- 8 50-75% of the time
- 2 25-50% of the time
- 2~~<25% of the time

# "Lab submission system needs improving"

Yes, I fully agree. I have already improved it and I will keep working on it.

One of the goals of the lab submission system is to get you familiar with Linux, something that will also be very useful in future courses.

What do the classes ColouredRectangle and ColouredCircle have in common?

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### Answer

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### Answer

The attribute colour, and the methods getColour, setColour, getArea and scale.

## Question

How can we reduce the code duplication?

#### Answer

By introducing a super class that contains the common features.

Which features can be moved to the super class?

Which features can be moved to the super class?

### Answer

The attribute colour, and the methods getColour and setColour.

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## Question

Why can't the methods getArea and scale be moved to the super class?

Which features can be moved to the super class?

#### Answer

The attribute colour, and the methods getColour and setColour.

## Question

Why can't the methods getArea and scale be moved to the super class?

### Answer

Because their bodies are not the same.

Should the client be able to create a ColouredShape object?

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### Answer

Probably not.

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## Question

How can we prevent the client from creating a ColouredShape object?

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#### Answer

Probably not.

## Question

How can we prevent the client from creating a ColouredShape object?

### Answer

Declare the class to be abstract.

## Problem

Given a list of ColouredShapes, we want to determine the total area of all red shapes combined, so that we know how much red paint to buy.

During early binding, to which class and method is the invocation shape.getArea() bound?

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### Answer

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The getArea() method of the ColouredShape class.

### Question

During late binding, to which class and method is the invocation shape.getArea() bound?

During early binding, to which class and method is the invocation shape.getArea() bound?

#### Answer

The getArea() method of the ColouredShape class.

### Question

During late binding, to which class and method is the invocation shape.getArea() bound?

### Answer

The getArea() method of a sub class of the ColouredRectangle class.

Why does each (non-abstract) sub class of ColouredShape have a non-abstract getArea() method?

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# Rule

Every non-abstract class has to implement all abstract methods of its super class.



Only Cube and Sphere have a volume.

## Question

Can we introduce an abstract class HasVolume with method getVolume() as a superclass for Cube and Sphere?

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## Question

Can we introduce an abstract class HasVolume with method getVolume() as a superclass for Cube and Sphere?

#### Answer

No, because Cube and Sphere already have a superclass and Java does not support multiple inheritance.

