COMP 401
PATTERNS, INTERFACES AND OBJECT EDITOR

Instructor: Prasun Dewan
A TALE OF TWO PIZAZZA THREADS

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Where can I find documentation for ObjectEditor? (Kevin Kimball)

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PREREQUISITE

- StateProperties (Beans)
- Graphics (Shape patterns)
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For each interface there are an infinite number of classes

For each pattern there are an infinite number of interfaces
public interface BMISpreadsheet {

    public double getWeight();
    public void setWeight(double newVal);

    public double getHeight();
    public void setHeight(double newVal);

    public double getBMI();
}
Infinite Classes Implement a Single Interface

At least two reasonable and correct implementations of the intended semantics and interface

Infinite number of unreasonable implementations of the semantics but correct implementation of the interface
**Bean Pattern**

Typed, Named Unit of Exported Object State

```java
public class C {
    private T p;

    public T getP() { ... }
    public void setP(T newValue) { ... }
}
```

- **Name P**
- **Type T**
- **Read-only**
- **Editable**
- **Getter method**
- **Setter method**

Violates Bean convention
INFINITE INTERFACES FOLLOW A SINGLE PATTERN

Bean Pattern

follows

BMISpreadsheet

follows

Point
INFINITE INTERFACES FOLLOW A SINGLE PATTERN

PointPattern follows ???

Point follows
**ObjectEditor Point Rules**

An object is recognized as a point representation if:

- Its interface or class has the string “Point” in its name or has a Point annotation
- It has (read-only) int properties, X and Y, representing Cartesian window coordinates
- Can have additional properties

```java
@StructurePattern(StructurePatternNames.POINT_PATTERN)
public interface Point {
    public int getX();
    public int getY();
    public double getAngle();
    public double getRadius();
}
```
An object is recognized as a point representation if:

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```java
@StructurePattern(StructurePatternNames.POINT_PATTERN)
public interface CartesianPoint {
    public int getX();
    public int getY();
}
```
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```java
@StructurePattern(StructurePatternNames.POINT_PATTERN)
public interface CartesianPoint {
    public int getX();
    public int getY();
    public void setX(int newVal);
}
```
**ObjectEditor Point Rules**

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```java
@StructurePattern(StructurePatternNames.POINT_PATTERN)
public interface CartesianPoint {
    public int getX();
    public int getY();
    public PolarPoint toPolarPoint();
}
```
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For each interface there are an infinite number of classes

For each pattern there are an infinite number of interfaces

Should we require you to follow interface or pattern when we specify your work? Tianwen Gu (Dereck)
LEARNING POINT OF VIEW

I just want to create a universal line interface and use it to derive all other line interfaces. Tianwen Gu (Dereck)
UNDERSTANDING POINT OF VIEW

But the rotatable line class is allowed to have setters for height and weight properties, even if I'm not gonna directly call them, right?
Tianwen Gu (Dereck)

Java tells you if you do not implement an interface at compile time

ObjectEditor will tell you problems at run time for Java, C# will try you at compile time for BeanPattern

E***For property: height in editable property names, please define a setter with the header:
   public void setHeight(double <parameter name>)
E***For property: weight in editable property names, please define a setter with the header:
   public void setWeight(double <parameter name>)
E***For property: BMI in property names, please define a getter with the header:
   public <T> getBMI()
A Tale of Two Piazza Threads

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**Does ObjectEditor Have an API**

An API is a set of public methods of an object type.

Only required call

```java
public class SquareCalculatorEditor {
    public static void main(String[] args) {
        bus.uigen.ObjectEditor.edit(new ABMIColorCalculator());
    }
}
```

ObjectEditor is a tool like Eclipse or your compiler – it reacts to you what you write; there is a contract.
A Tale of Four Piazza Questions/Comments

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When we set the x or y value of the upper left corner, should the entire line shift or just the upper left corner. For example, if we set x to 5, should we also shift the lower right corner 5?

#assignment5

**the students' answer**, where students collectively construct a single answer

The entire line should move. The upper left corner decides the location of the line, but it doesn't have anything to do with what the line looks like.
|------------------------------------------|--------------------------------------------------------------------------------------------------|

**Tool Documentation in One Place**

Need to be on UNC network to get papers
Research shows people do not use or know about even a small fraction of tool features available
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“Intuitive” Design?

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    public double getRadius();
}
```
“Intuitive Design”

Line

Rectangle

Oval

X, Y

Width

Height

X, Y

Width

Height

X, Y

Width

Height
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Graphics Pattern vs. Command Line

- Graphics Project
- Patterns rather than command line syntax (also used non standard)
- Code understandability can be verified by TAs
- Standardization shows opportunities for reuse and inheritance
- Incremental steps: Training wheels to be removed ultimately
TRADEOFFS

This option is available for free
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I want to make sure I understand Part 4: Composite Angle Class of the assignment. The whole point is trying to represent the value of an angle by using two lines connected at the origin. So, the value for the "angle" will be represented as the actual angle between the two lines. So if the angle is $\pi/2$ radians, the lines should look like this: \_

And if the angle is $\pi/3$, the lines should look a little bit like this: /

If my interpretation is right, it seems like the vertical line is fixed, and that all the angles can really be represented by just moving the other line. I want to make sure this is right, because the assignment asks for two rotating lines, but it seems to be that one fixed line and one rotating line are enough.

Thank you.

Eliezer Encarnaci