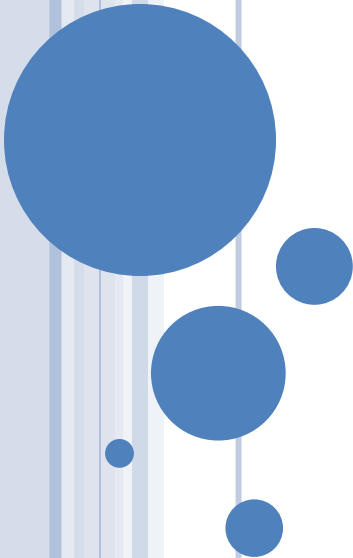




COMP 401

PATTERNS, INTERFACES AND OBJECTEDITOR

Instructor: Prasun Dewan



A TALE OF TWO PIAZZA THREADS

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PREREQUISITE

- StateProperties (Beans)
- Graphics (Shape patterns)



INTERFACES VS. 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



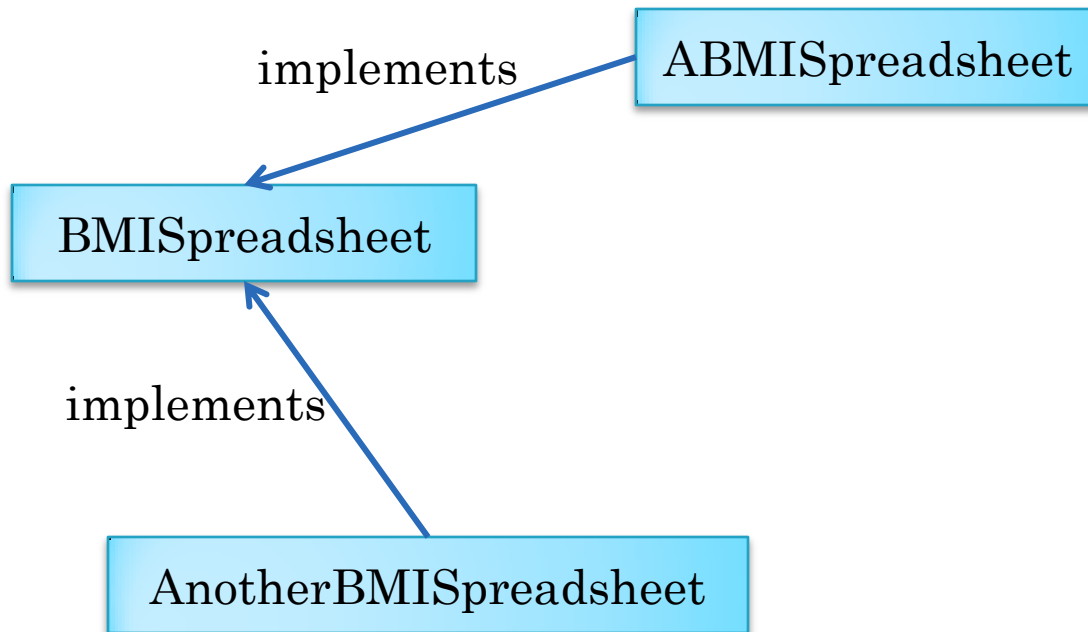
INTERFACE

BMISpreadsheet.java ✕

```
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



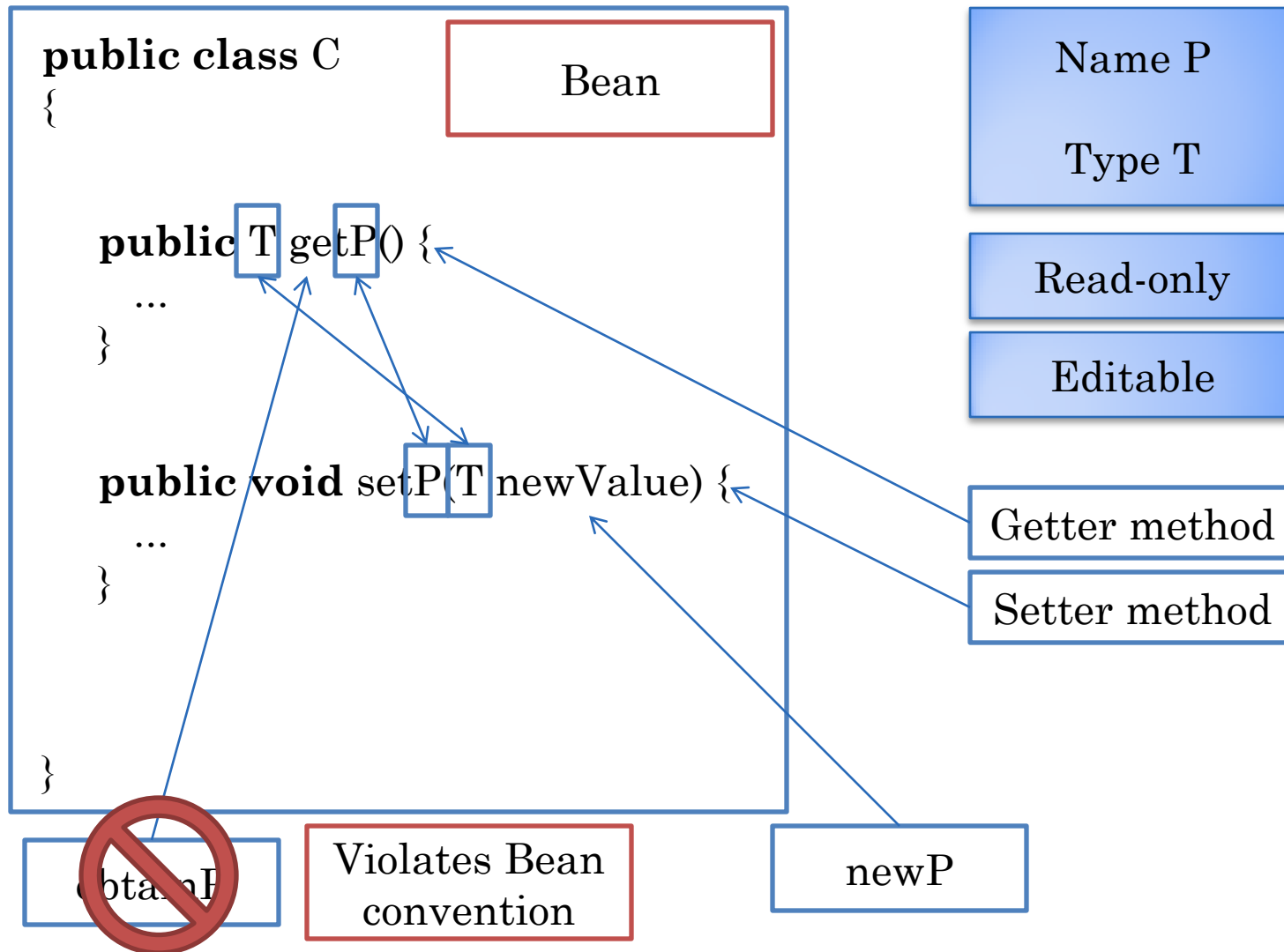
At least two reasonable and correct implementations of the intended semantics and interface

Infinite number of unreasonable implementations of the semantics but correct implementation of the interface

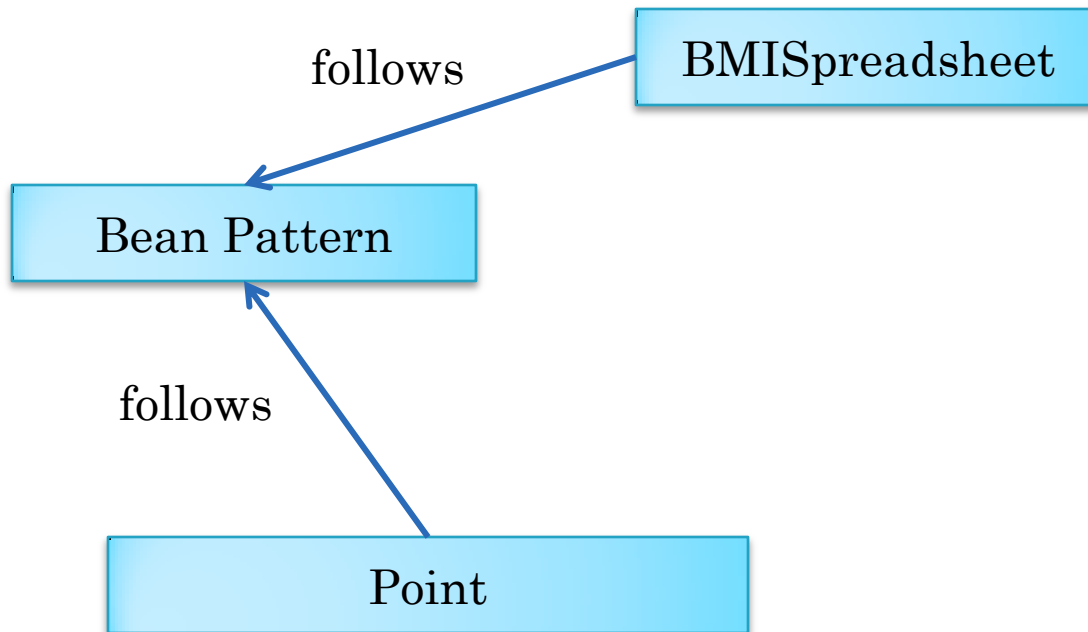


BEAN PATTERN

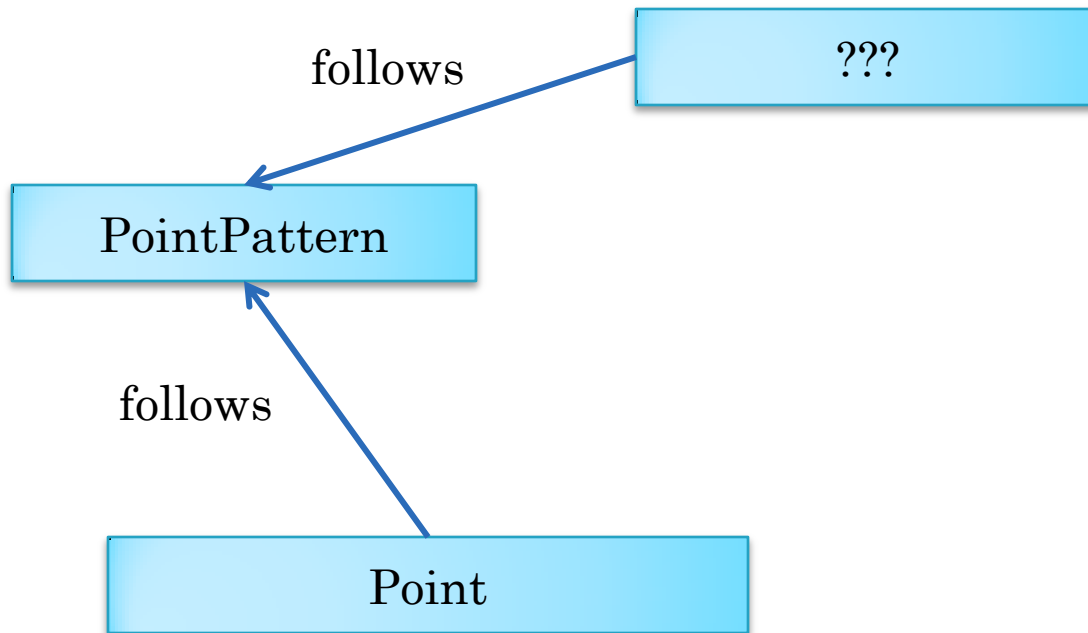
Typed, Named Unit of Exported Object State



INFINITE INTERFACES FOLLOW A SINGLE PATTERN



INFINITE INTERFACES FOLLOW A SINGLE PATTERN



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

```
@StructurePattern(StructurePatternNames.POINT_PATTERN)
public interface Point {
    public int getX();
    public int getY();
    public double getAngle();
    public double getRadius();
}
```

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```
@StructurePattern(StructurePatternNames.POINT_PATTERN)
public interface CartesianPoint {
    public int getX();
    public int getY();
}
```

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

OBJECTEDITOR POINT RULES

- An object is recognized as a point representation if:
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 - It has (read-only) int properties, X and Y, representing Cartesian window coordinates
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```
@StructurePattern(StructurePatternNames.POINT_PATTERN)
public interface CartesianPoint {
    public int getX();
    public int getY();
    public PolarPoint toPolarPoint();
}
```

INTERFACES VS. PATTERNS

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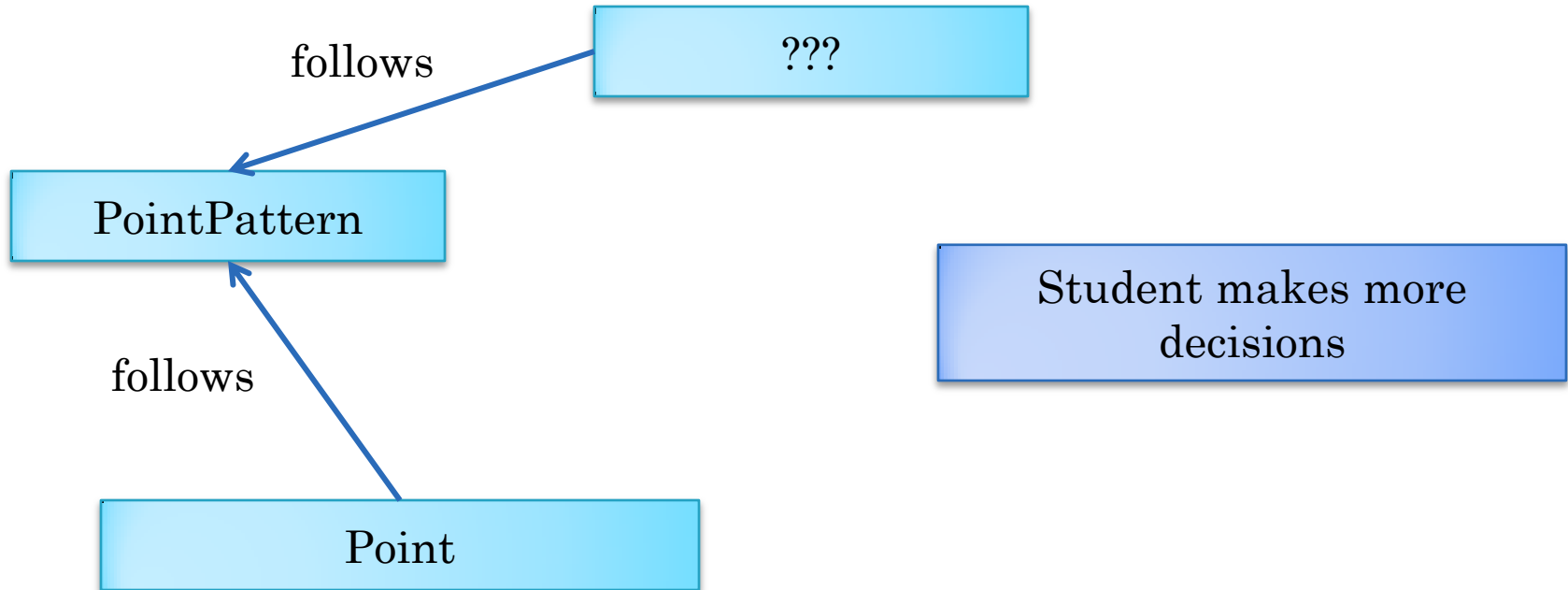
For each interface there are an infinite number of classes

For each pattern there are an infinite number of interfaces

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()
```



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DOES OBJECTEDITOR HAVE AN API

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

Only required call

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

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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SPREAD OUT DOC

110 and 401	Graphics (9/12, 9/17)	<u>PowerPoint</u>	<u>PDF</u>	<u>Graphics Chapter</u>			lectures.graphics <u>Package</u>
-------------------	-----------------------------	-------------------	------------	-----------------------------	--	--	----------------------------------

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

edit

save to favorites

0

good question

0

more ▾

19 hours ago by Shunjie Jame... (anon. to classmates)

1

S 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.

PPT, Word, Code

Piazza



TOOL DOCUMENTATION IN ONE PLACE

The use of ObjectEditor in Comp 110
and 401

[Prasun Dewan, How a Language-based GUI Generator Can Influence the Teaching
ACM SIGCSE, 2012.](#)

Need to be on UNC network to get papers



PROBLEM BASED VS. COMPLETE DOCUMENTATION

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Eclipse Documentation

This page is a sub-feature source used by Eclipse

The Eclipse project is a free and open-source software development tool for Java, JavaScript, PHP, Python, Ruby, and many other languages. It is developed by the Eclipse Foundation.

- Workbench
- Platform F
- Java Dev
- JDT Plug-
- Plug-in De

"User Guide" plug-in development

All Eclipse project extension point documentation

110 and 401	Eclipse Install and Basic Use (Look on your own)	PowerPoint	PDF	Warm-up Chapter
110 and 401	ObjectEditor Install (Look on your own)	PowerPoint	PDF	Warm-up Chapter
401	Specifying Main Args in Eclipse (Look on your own)	PowerPoint	PDF	Warm-up Chapter
401	Debugging in Eclipse (Look on your own)	PowerPoint	PDF	Warm-up Chapter

Research shows people do not use or know about even a small fraction of tool features available



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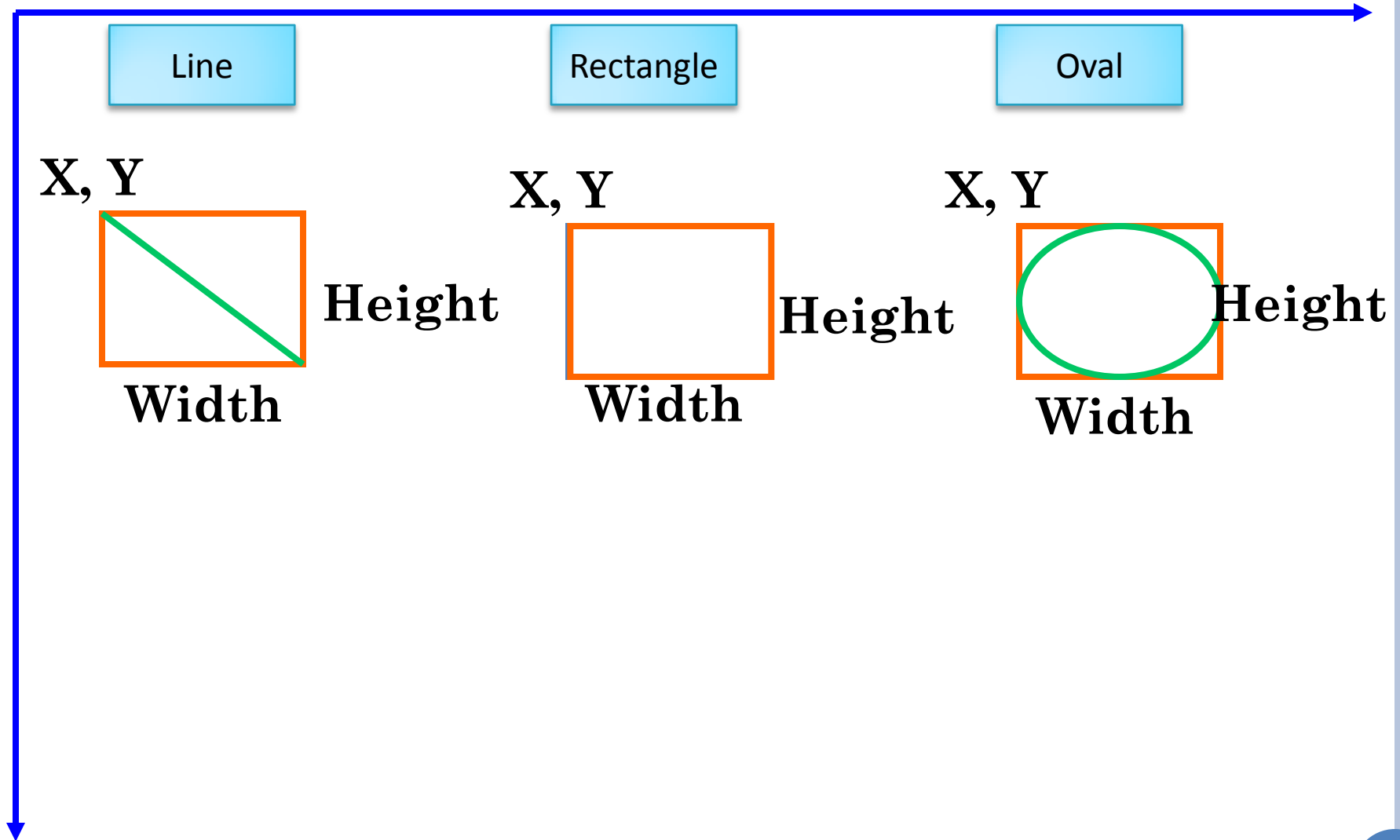
“INTUITIVE” DESIGN?

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“INTUITIVE DESIGN”



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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



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THE CASE FOR CHALLENGING

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: I_

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

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

