



COMP 110/401

DOCUMENTATION: ANNOTATIONS

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PREREQUISITE

- Documentation Comments

-



PROGRAMMING STYLE: THE ART OF PROGRAMMING

Use Interfaces	✓
Efficiency	✓
Document Program	
Avoid Code Repetition	✓
Giving Least Privilege	✓
Use Named Constants	✓

DOCUMENTATION

Comments are one form of documentation about a program

External descriptions of a program are also useful

```
{@link  
http://www.oracle.com/technetwork/java/javase/documentation/index-  
137868.html#exampleresult}
```

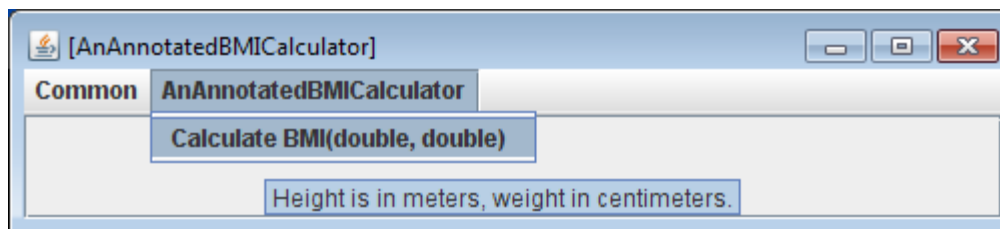
Annotations: Internal descriptions available at runtime (to runtime tools) also useful

ANNOTATION VS. COMMENT

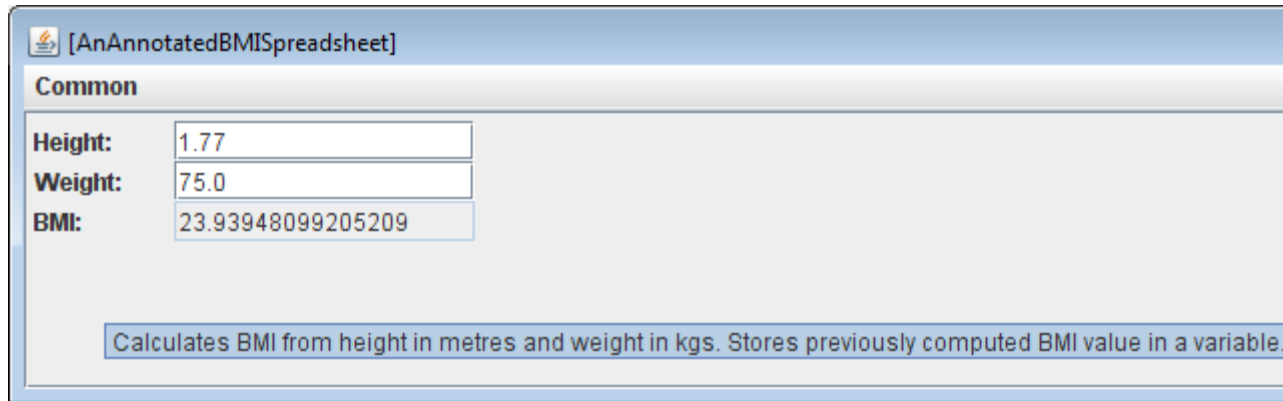
```
import util.annotations.Explanation;
@StructurePattern(StructurePatternNames.NO_PATTERN)
@Explanation("Height is in meters, weight in centimeters")
public class AnAnnotatedBMICalculator {
    public double calculateBMI(double height, double weight) {
        return weight/(height*height);
    }
}
```

Annotation not removed by compiler

Available to ObjectEditor



EXPLANATION ANNOTATION?



[AnAnnotatedBMISpreadsheet]

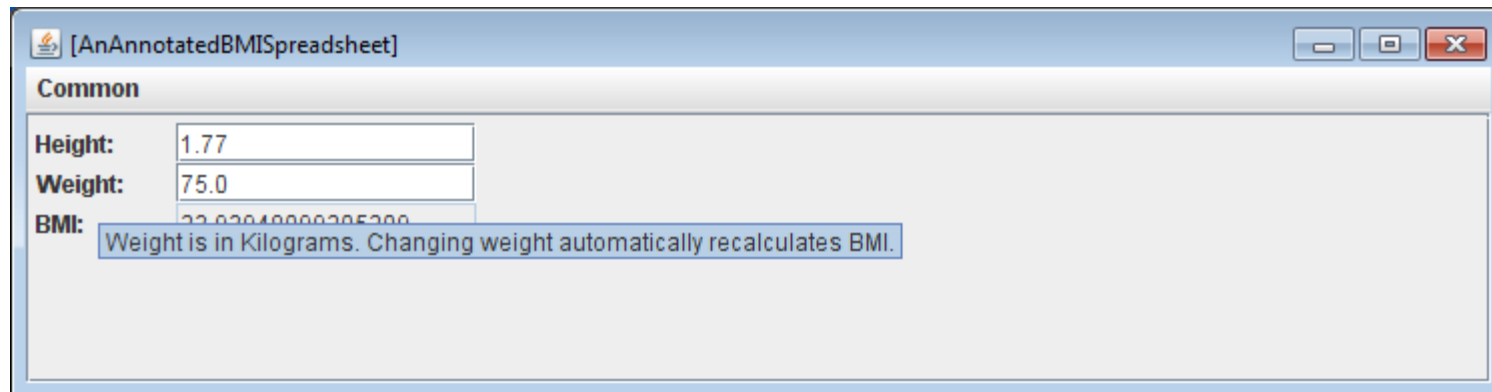
Common

Height: 1.77

Weight: 75.0

BMI: 23.93948099205209

Calculates BMI from height in metres and weight in kgs. Stores previously computed BMI value in a variable.



[AnAnnotatedBMISpreadsheet]

Common

Height: 1.77

Weight: 75.0

BMI: 23.93948099205209

Weight is in Kilograms. Changing weight automatically recalculates BMI.

ANNOTATED INTERFACE AND CLASS

```
@Explanation("Calculates BMI from height in metres and weight in  
kgs.")  
public interface AnnotatedBMISpreadsheet {  
    public double getHeight();  
    public void setHeight(double newVal);  
    @Explanation("Weight is in Kilograms. ")  
    public double getWeight();  
    @Explanation("Changing weight automatically recalculates BMI.")  
    public void setWeight(double newVal);  
    public double getBMI();  
}
```

```
@Explanation("Stores previously computed BMI value in a variable.")  
public class AnAnnotatedBMISpreadsheet implements  
                                                AnnotatedBMISpreadsheet  
{...}
```

EXPLANATION AND UI DOCUMENTATION

- Menu item tooltip text
 - Explanation annotation of associated method
- Property tooltip text
 - Sum of getter and setter explanations
- Object tooltip text
 - Sum of interface and class explanations

Some documentation is outside a class

In PPT, PDF, and other Web Docs

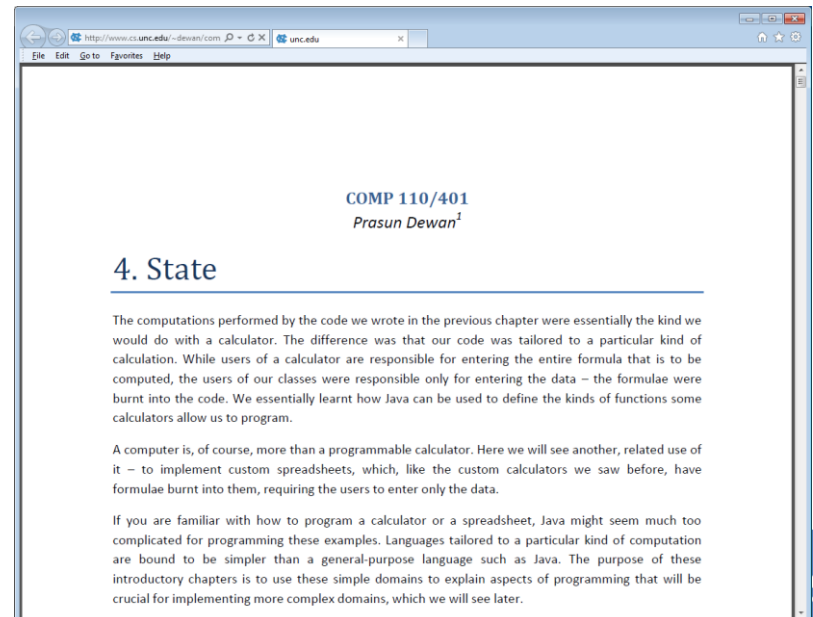
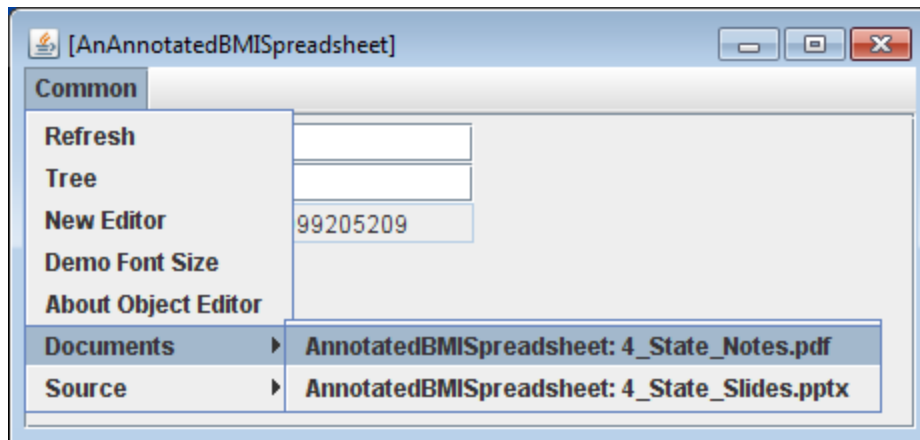
WEB DOCUMENTS

```
@WebDocuments ({
    "http://www.cs.unc.edu/~dewan/comp114/f11/Class%20Notes/4_State_Notes.pdf",
    "http://www.cs.unc.edu/~dewan/comp114/f11/Lectures/4_State_Slides.pptx"
})

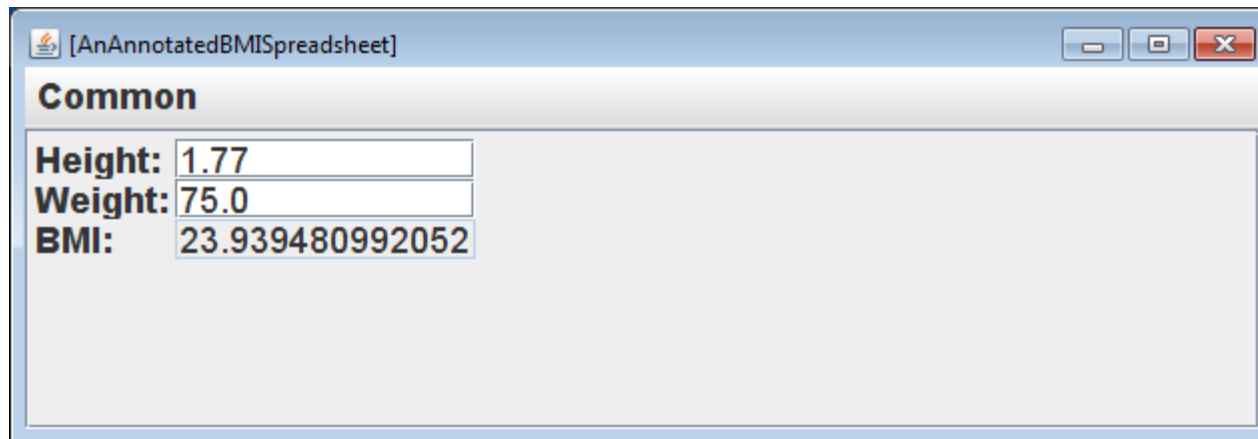
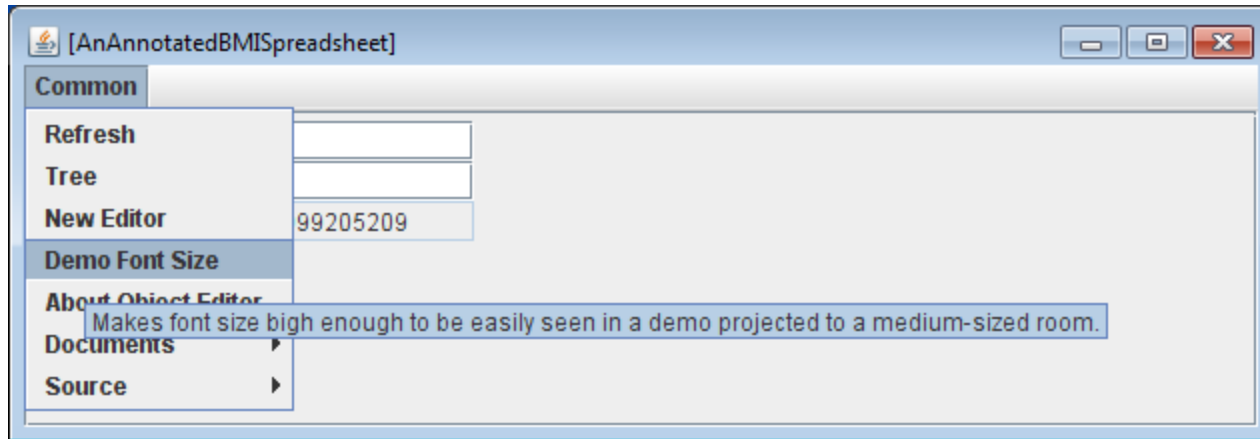
public interface AnnotatedBMISpreadsheet {public interface
AnnotatedBMISpreadsheet {

    ...

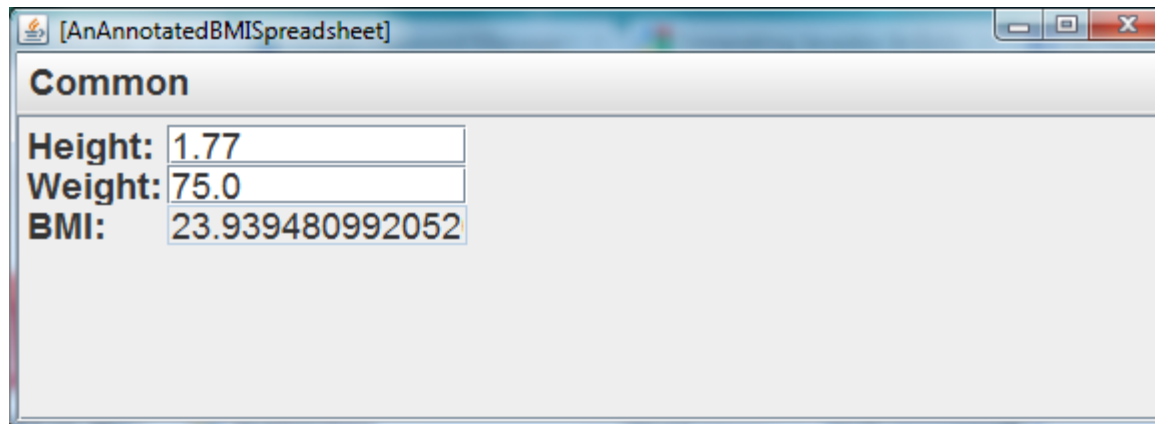
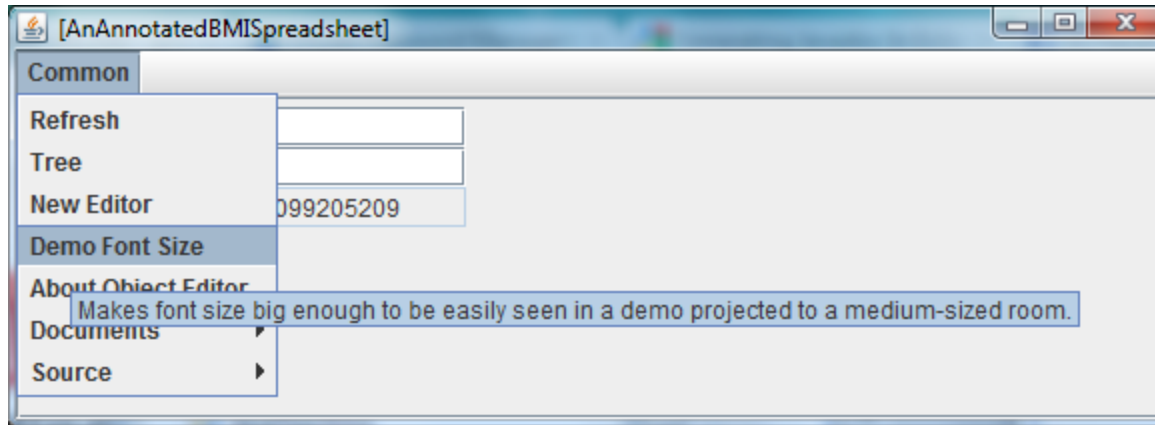
}
```



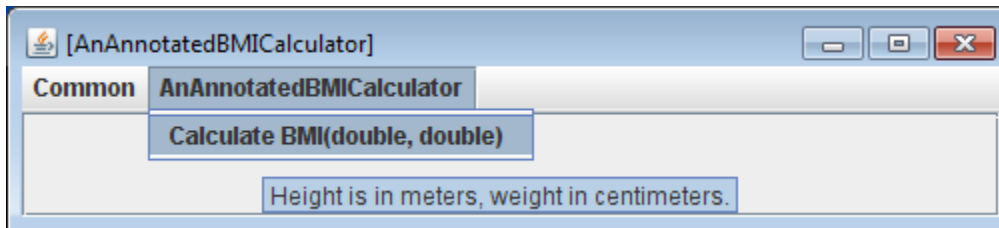
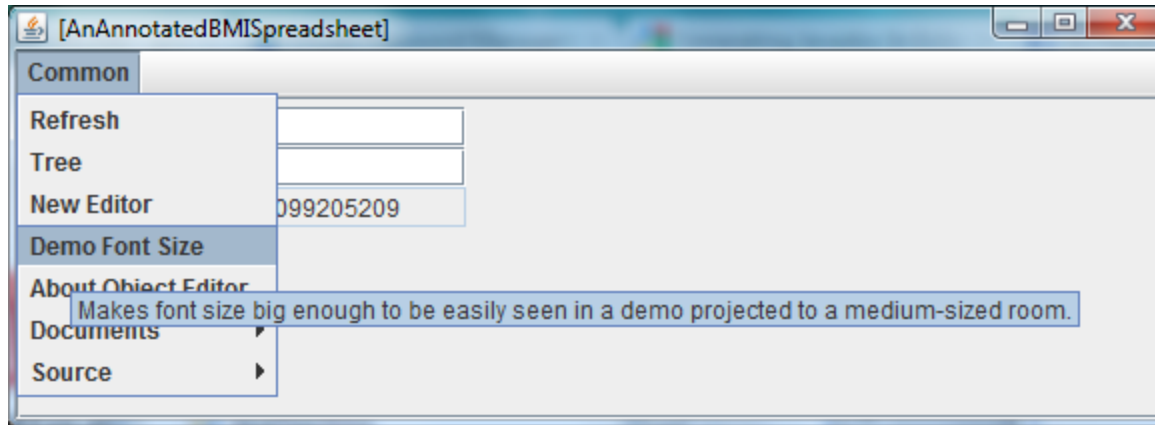
COMMON MENU



COMMON MENU



TOOLTIP TEXTS IN COMMON AND OBJECT MENU



ObjectEditor used to build itself

Meta circularity – a la Interpreter “interpating” itself

Bootstrapping – a la OS loading itself

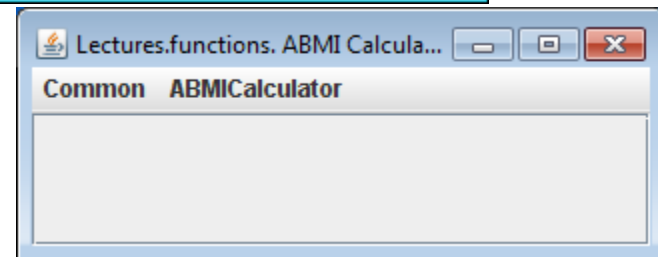
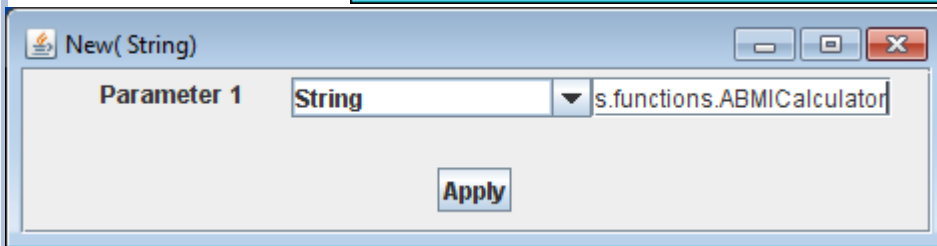
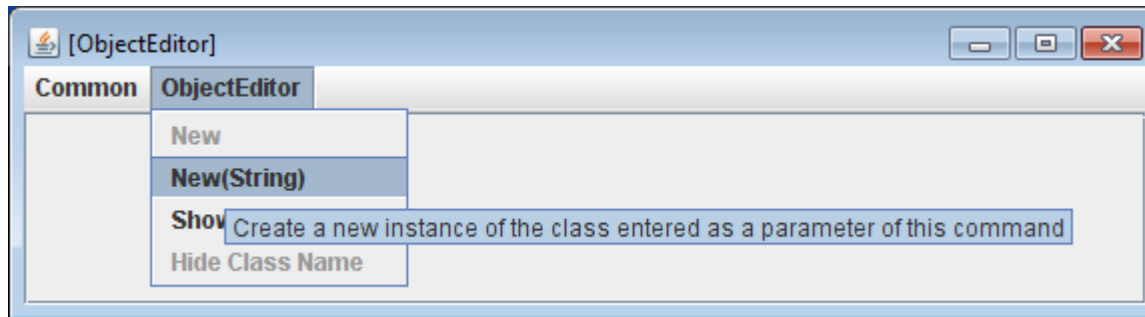
Requires a layered implementation

LAYERED IMPLEMENTATION

```
public class ADemoFontOperationsModel implements FrameModel {  
    @Explanation ("Makes font size big enough to be easily seen in a  
demo projected to a medium-sized room.")  
    public void demoFontSize() {  
        ...  
    }  
    ...  
}
```

EDITING OBJECT EDITOR

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



Can instantiate and edit objects without using knowing about or using main