CSE 115/503

February 8-12, 2010

Announcements

• Lab 3 (part 1) in recitation this week
• Exam 2 is Friday, February 19th – review in class on Wednesday, February 17th
• Review sheet posted this week
Exam 1 Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>34 (2) [9 F’s total]</td>
</tr>
<tr>
<td>Median</td>
<td>87</td>
</tr>
<tr>
<td>Average</td>
<td>81.62</td>
</tr>
<tr>
<td>Max</td>
<td>100 (6) [49 A’s total]</td>
</tr>
<tr>
<td>Std Dev</td>
<td>14.62</td>
</tr>
</tbody>
</table>

Inside the constructor for MyBugCollection we declared variables for the Terrarium, an Ant, and a Caterpillar.

These variables are called local variables.

Local refers to the scope of the variable.
Scope (of any variable): the part of the program where the variable is in effect/accessible.

Local variable scope is from the point of declaration until the end of the method body.

Relationships between objects

- Formal name
- Informal name
- Representation in source code
- Representation in UML
UML = Unified Modeling Language
"Graphical Language"

Class Diagrams

Class Box

- Class Name
- Properties
- Capabilities
Relationship Recap

- Formal name: Instantiation Dependency
- Informal name: “uses”
- UML
Relationship Recap

• In source code:

```java
public class Source {
    public Source() {
        new Target();
    }
}
```

Relationship Recap

• Formal Name: Local Variable Dependency
• Informal Name: “uses”
• UML:

![UML Diagram]
Relationship Recap

• In source code:

```java
public class Source {
    public Source() {
        Target target = new Target();
    }
}
```

Graphical Programming

• Creating your own graphics from scratch
• Every program needs a `javax.swing.JFrame`.
JFrames

• Can have their title set by passing in a string into the constructor
• Should be packed (so they can size themselves according to what graphics are inside them).

JFrames

• Need their default close operation set if you want your program to end when the window is closed
• Need to have their visibility set to “un-hidden”
In Source Code

```java
javax.swing.JFrame frame = new javax.swing.JFrame("title here");
frame.setDefaultCloseOperation
    (javax.swing.JFrame.EXIT_ON_CLOSE);
frame.pack();
frame.setVisible(true);
```

Adding something to the Frame

- We can add one (and only one) graphical container to the JFrame’s content pane.
- We can add all our other graphics to that container.

- Syntax:

```java
frame.getContentPane().add(/*graphical container here*/);
```
**DrawingCanvas**

- Can be used to draw upon.
- When created, we should set its Dimension (size) and can optionally pick a background color.

**graphics elements**

- Elements that live in the graphics package that can be put on DrawingCanvases.
- For graphical elements, we need to set their dimension, location, and color to meet our needs.
All Graphical Objects

- Will need to be created
- Will need various properties set to our liking
- Will need to be added to a graphical container
  – Which will be added to another container … until that container is the one added to the content pane on the JFrame