Debugging Techniques

COMP 110
Summer II 2012

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Debugging Programs

- Process for resolving errors in programs
- There are many techniques available, depending on the error
Debugging Syntax Errors
Debugging Syntax Errors

Symbol indicating compiler error with suggested fix

Click on the suggested fix icon to show the suggestions
Debugging Syntax Errors

Symbol indicating compiler error without suggested fix

Hover over the symbol to identify the problem
Debugging Non-Syntax Errors

- Many Techniques
  - Add extra code to display state
  - Use a debugging tool
Debugging by Adding Code

- **How?**
  - Add extra `println(...)` statements
  - Add calls to `JOptionPane`’s methods

- **What to Write?**
  - Current stage of the program
  - Current variable values
Debugging by println/JOptionPane

- Advantages
  - Often simple to write
  - Yields a program trace with history

- Disadvantages
  - Clutters up the code
  - Clutters up the output
    - The debugging statements need to be removed or disabled before releasing (submitting) the program
Debugging by Tool

- Eclipse has an integrated debugging tool
- Start the program using the bug icon

Run Program Using Debugger
Run Program Without Debugger
Running with the Debugger

- When the program is run with the debugger, it will run normally until:
  - A runtime error occurs
  - A breakpoint is encountered
Running with the Debugger

- The current location in your program
- The runtime error, if halted due to runtime error
- The variables in scope
Double-click in this region to toggle a breakpoint
Stepping Through the Program
Stepping Through the Program

- **Stop Execution** – Terminate the program
- **Pause Execution** – Freeze an already running program
- **Resume Execution** – Unfreeze a paused program
- **Step Over** – Execute the current line and pause
Switching Between Perspectives

Go to the Normal Coding Perspective

Go to the Debugging Perspective
Questions?
Logistics

- Next:
  - Open Lab Time

- Monday:
  - Arrays & Loops

- Assignments:
  - Lab 3 is Due on Tuesday
  - Program 2 is Due next Friday