DEBUGGING AND INDEFINITE LOOPS

CSSE 120—Rose Hulman Institute of Technology

Exam 1

□ Questions?

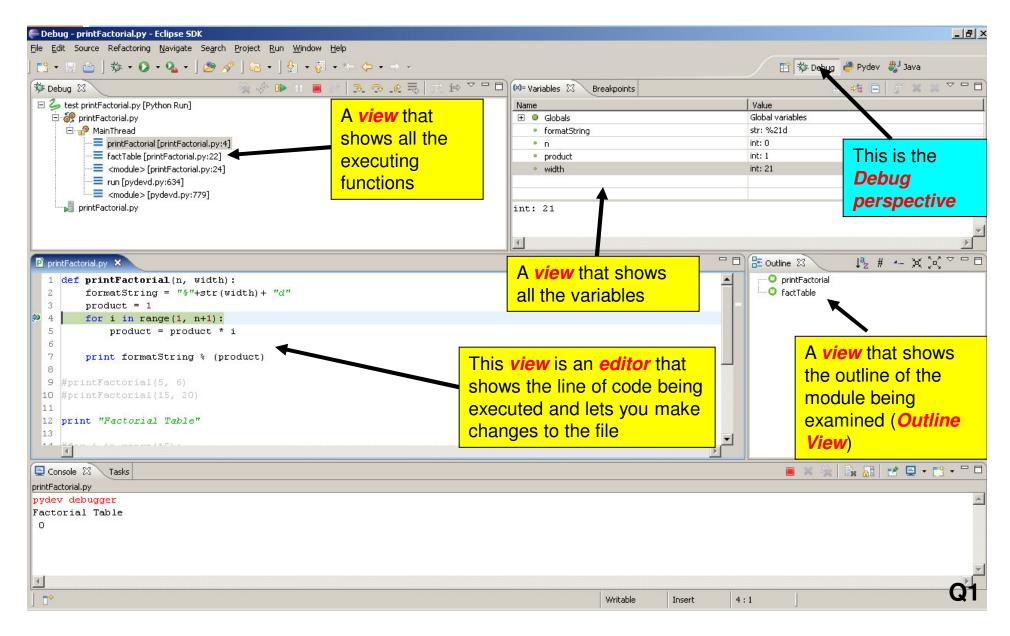
Debugging

- Debugging includes:
 - Discovering errors
 - Coming up with a hypothesis about the cause
 - Testing your hypothesis
 - Fixing the error
- Ways to debug
 - Insert print statements to show program flow and data
 - Use a debugger:
 - A program that executes another program and displays its runtime behavior, step by step
 - Part of every modern IDE

Using a Debugger

- Typical debugger commands:
 - Set a breakpoint—place where you want the debugger to pause the program
 - Single step—execute one line at a time
 - Inspect a variable—look at its changing value over time
- Debugging Example
 - Checkout the Session 10 project from your repository and open factorial Table.py

Sample Debugging Session: Eclipse



Tips to Debug Effectively

- Reproduce the error
- Simplify the error
- Divide and conquer
- Know what your program should do
- Look at the details
- Understand each bug before you fix it
- Practice!

Use the scientific method:

- •hypothesize,
- •experiment,
- ·fix bug,
- repeat experiment

Review: Definite Loops

- Review: For loop
 - Definite loop: knows before the loop starts to execute the number of iterations of the loop body
 - Counted loop: sequence can be generated by range()
 - Example: Most for loops
- Syntax:

Is This Loop a Definite Loop?

```
# Open the file
inputFile = open(inputFileName, 'r')

# Process each line of file
for line in inputFile:
    image = Image(imageCenter, line.rstrip())
    image.draw(win)
    time.sleep(delay)

win.getMouse()
inputFile.close()
win.close()
```

Indefinite Loops

- Number of iterations is not known when loop starts
- □ Is a conditional loop
 - Keeps iterating as long as a certain condition remains true
 - Conditions are Boolean expressions
- Typically implemented using while statement
- Syntax:

While Loop

- □ A pre-test loop
 - Condition is tested at the top of the loop
- Example use of while loops

Nadia deposits \$100 in a savings account each month. Each month the account earns 0.25% interest on the previous balance. How many months will it take her to accumulate \$10,000?

Infinite loops on purpose

- With for loops, we could make the program run for a really long time, but not forever.
- Create a very simple while loop that runs forever.

Exercise: While Loops

Open guessMyNumber.py in the Session 10 project.

Follow the instructions there and demo your program to your instructor or an assistant when you finish.

Commit your work



When you are done, please start HW10.