PRACTICE, ECLIPSE. DEBUGGER

CSSE 120 – Rose-Hulman Institute of Technology

Integrated Development Environments (IDEs)

- What are they?
- Why use one?
- Our IDE – Eclipse
  - Why we chose it
  - Basic concepts in Eclipse
    - Workspace, Workbench
    - Files, folders, projects
    - Views, editors, perspectives
    - http://www.rose-hulman.edu/class/csse/resources/Eclipse/installation.htm

The next slides address the listed points

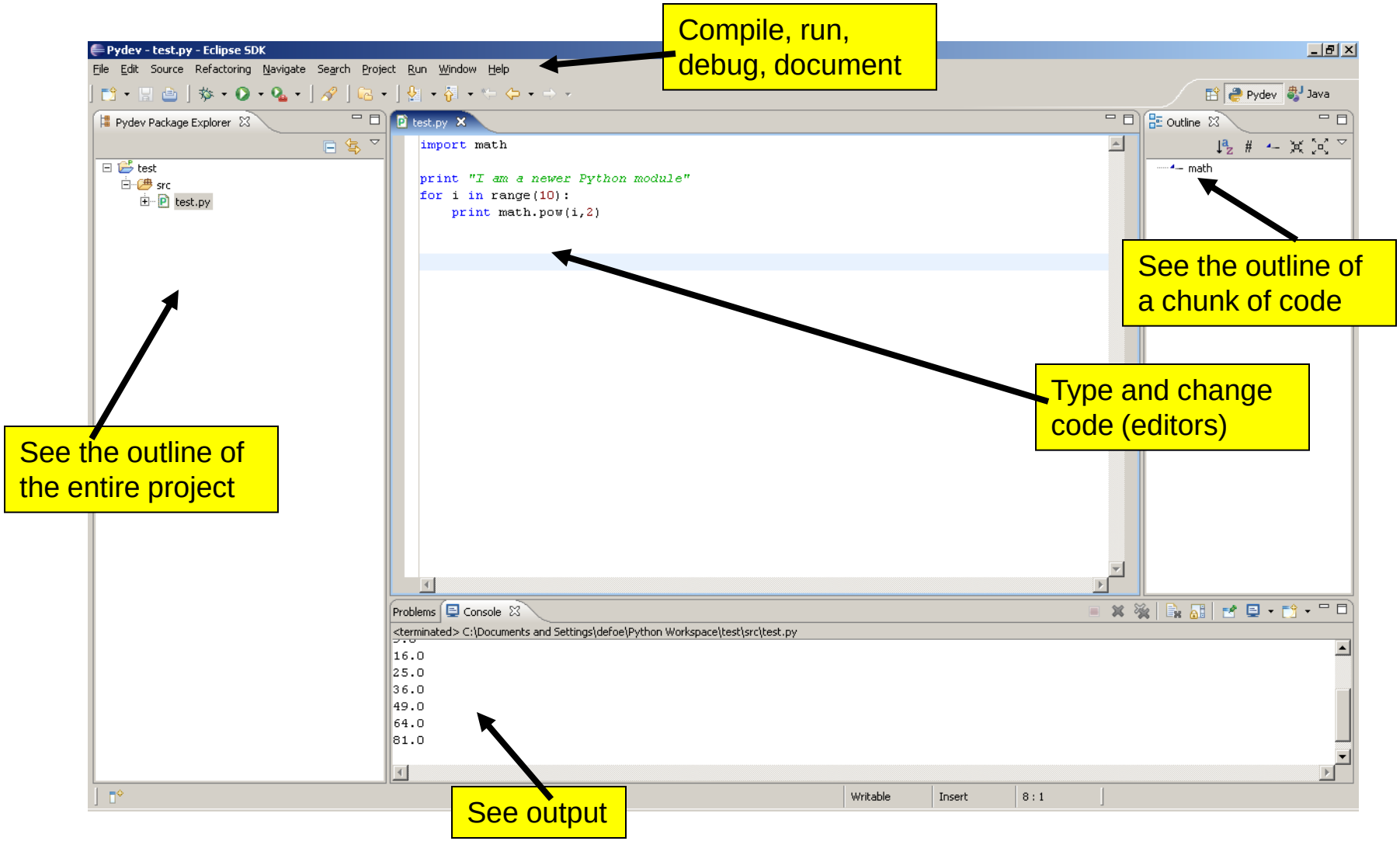
If your Eclipse still doesn't work

- **In class today:**
  - Look on with someone else during debugger demo
  - Use other person's computer when pair programming
- **Later:**
- Follow the instructions in HW 4
- See the lab assistants or in-class assistants if you need help

IDEs – What are they?

An IDE is an application that makes it easier to develop software.

They try to make it easy to:



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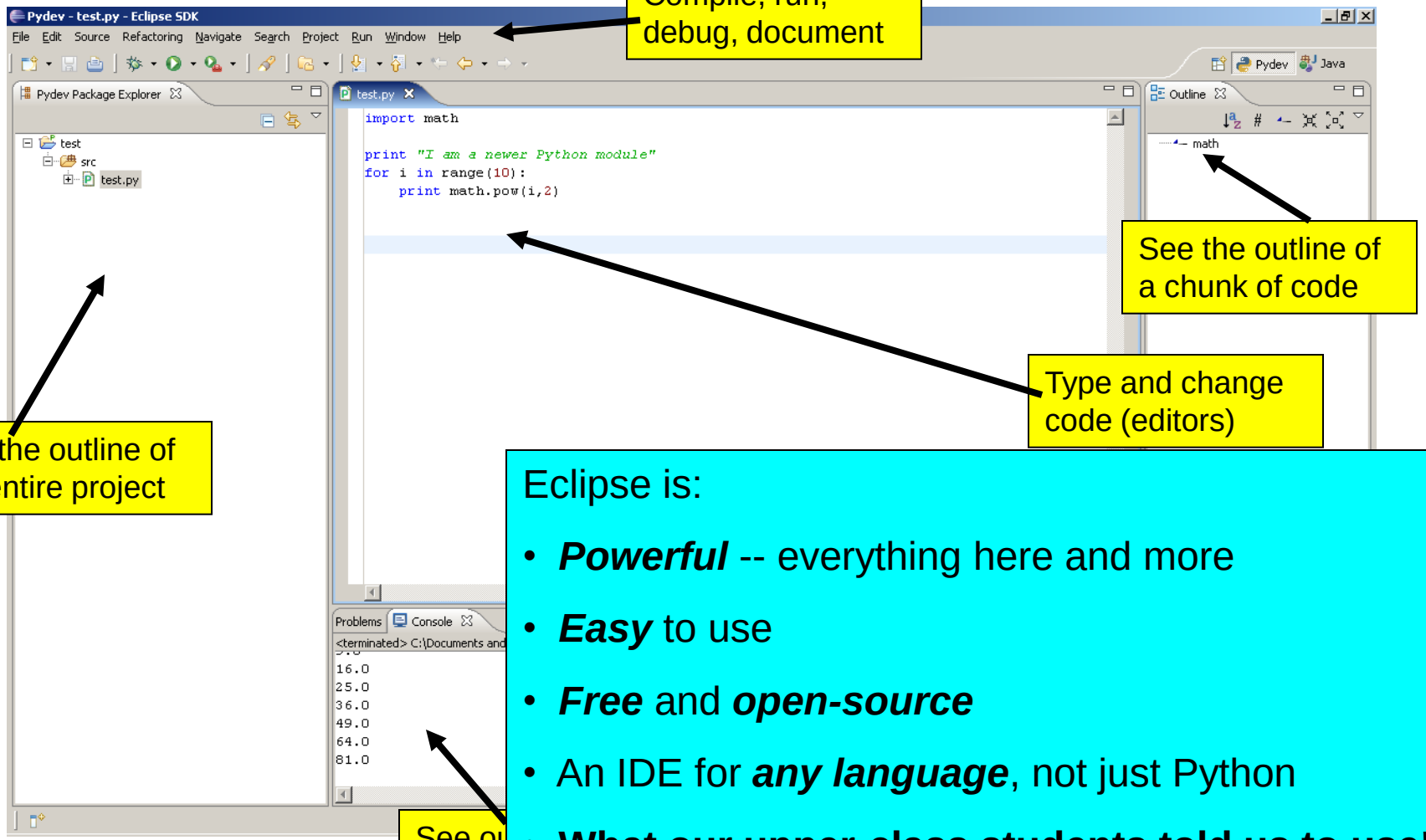


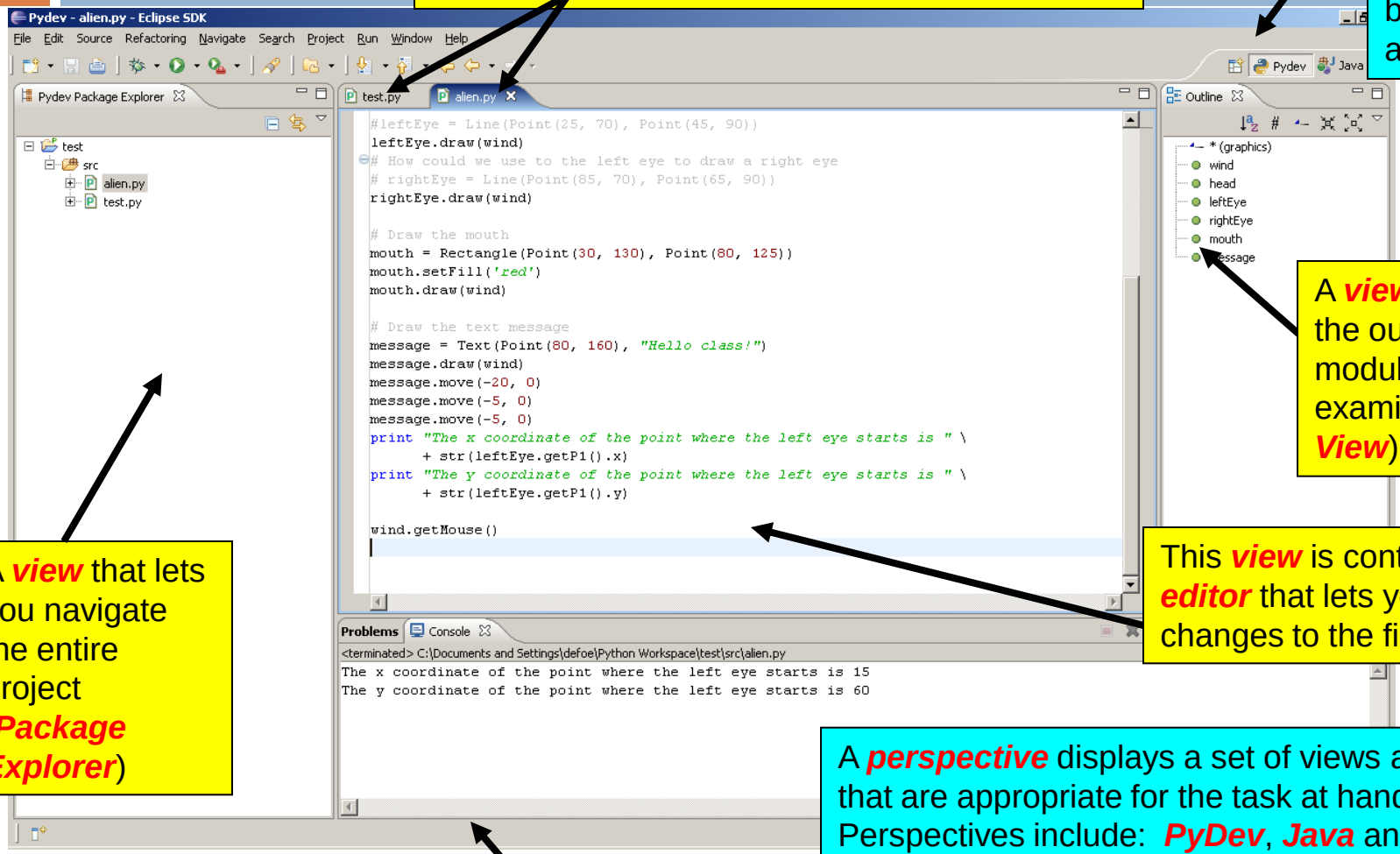
Eclipse is:

- ***Powerful*** -- everything here and more
- ***Easy*** to use
- ***Free*** and ***open-source***
- An IDE for ***any language***, not just Python
- **What our upper-class students told us to use!**

Basic concepts in Eclipse

- ***Workspace*** – where your ***projects*** are stored on your computer
- ***Project*** – a collection of files, organized in folders, that includes:
  - ***Source code*** (the code that you write)
  - ***Compiled code*** (what your source code is translated into, for the machine to run)
  - ***Design documents***
  - ***Documentation***
  - ***Tests***
    - And more that you will learn about over time
- ***Workbench*** – what we saw on the previous slide, that is, the tool in which you do your software development

Views, editors, perspectives



Tabbed ***views*** of the source code of this project

This is the ***PyDev perspective*** but just a button click brings us to another

A ***view*** that shows the outline of the module being examined (***Outline View***)

A ***view*** that lets you navigate the entire project (***Package Explorer***)

This ***view*** is controlled by an ***editor*** that lets you make changes to the file

A ***perspective*** displays a set of views and editors that are appropriate for the task at hand. Perspectives include: ***PyDev***, ***Java*** and lots more

Tabbed ***views*** (***Problems***, ***Console***)

Eclipse in a Nutshell

- ***Workspace*** – where your ***projects*** are stored on your computer
- ***Project*** – a collection of files, organized in folders, that includes:
  - ***Source code*** and ***Compiled code*** and more
- ***Workbench*** – the tool in which to work
  - It has ***perspectives*** which organize the ***views*** and ***editors*** that you use
- ***View*** – a "window within the window"
  - displays code, output, project contents, debugging info, etc.

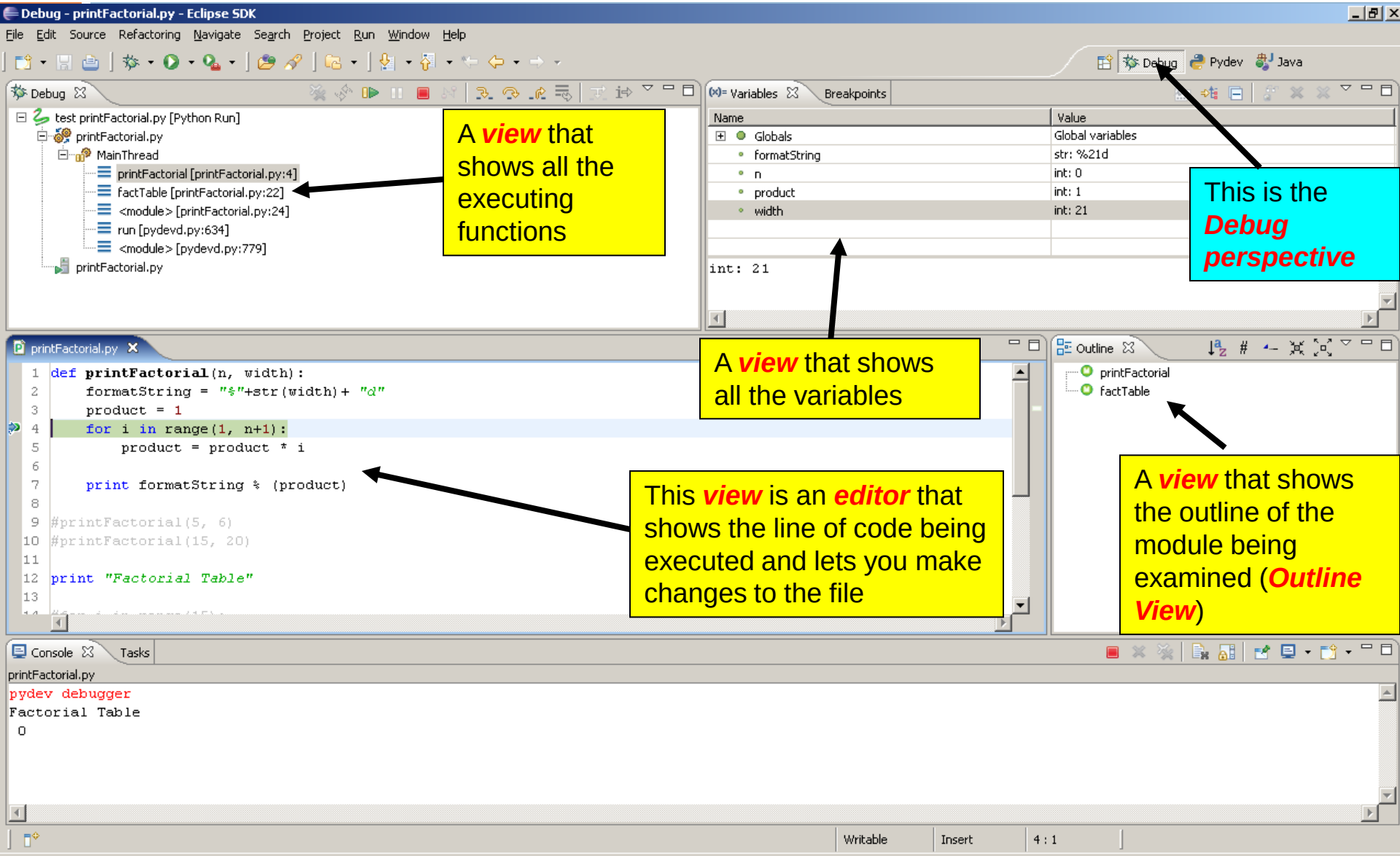
Debugging

- 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
  - In the MoveCircle.py file, your instructor will show you how to double-click to set a breakpoint at the line that contains the call to the sleep function.

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

Practice with Loops, Lists, Strings

- Work with another student, pair programming
- Several small programs/exercises
- If you do not finish them, do so for homework
- Use Eclipse, so you can get practice with it
- Make a new PyDev project called Session6
- Make a new Pydev module called Session6
- Put all of your code/answers for the in-class exercises in this file(Session6.py)
- Details are in the HW 6 document
  - Accessible frm the Schedule page.