

# Debugger 101

*Bill Krieger - Jan 2015*

Everyone who programs **needs** to know how to use a debugger. This is the most significant productivity-enhancer available to a programmer.

This base-bones tutorial introduces you to debugger concepts via 1) this document, and 2) a simple, but problematic, Java program for you to debug.

## Debugging concepts

The most important thing a debugger lets you do is stop your program while it's running, and then execute your program one line at a time. Here are the basics you need to know:

- **Set a breakpoint** - You tell the debugger where to pause the execution of your program so you can start debugging. In NetBeans, you select the line number where you want to stop. It will turn **red** when you do this.
- **Run the debugger** - Once your breakpoint is set, run the debugger. There is usually a different icon or menu command to run the debugger.
- **Next/Step over** - Once you've hit your breakpoint, you can execute your code one line at a time using Next/Step over. Next, next, next... until you find your bug.
- **Step into** - When you hit a method call, you can tunnel down into the method by stepping into, rather than over, that call.
- **Examine variables** - All debuggers let you examine variable values as you step through your program. NetBeans has a variable window, showing all the currently active variables. Also, pausing your mouse over a variable name will display its value.
- **Stop the debugger** - Once you've found and fixed your bug, stop the debugger.

Undoubtedly, your debugger does much more than this. But these basic commands comprise more than 90% of what you'll need to debug most programs. Sweet!

## Debugger101.java

Start your IDE and run your debugger on Debugger101.java. It should be self-explanatory. Just run it. The Debugger101 program will crash on you and do other "bad" things. Run it. Let it crash. And then start debugging. Set your breakpoints. Fix the problem. Rinse and repeat.

If you have any questions or comments, please email me: [wtkrieger@noctrl.edu](mailto:wtkrieger@noctrl.edu)

Thanks, Bill

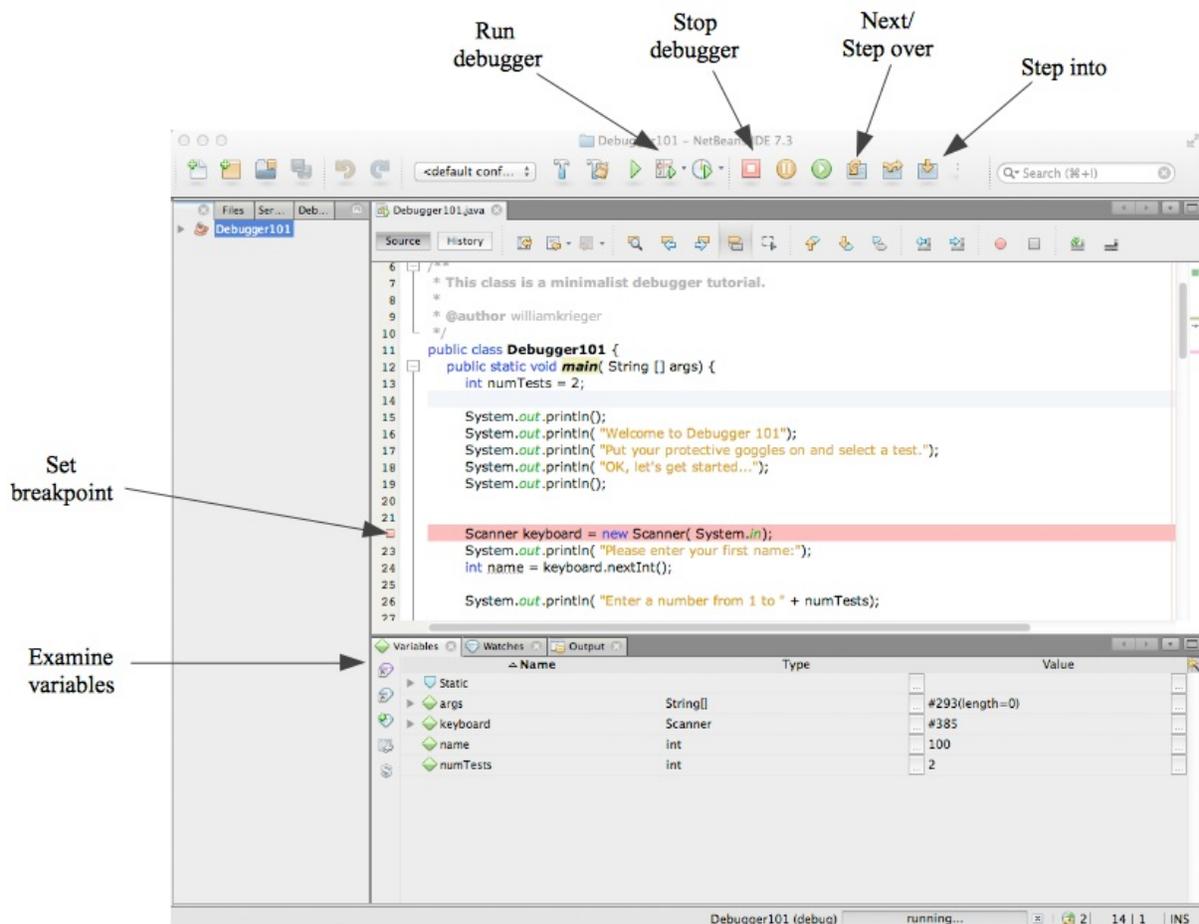
## NetBeans debugging

I think this is the official NetBeans tutorial: [netbeans.org/kb/docs/java/quickstart.html](http://netbeans.org/kb/docs/java/quickstart.html)

The NetBeans debugging window is shown below.

A couple of things to note:

- You need to select the “Output” tab to enter Stdin input and to see Stdout console output.
- Pause your mouse over a variable and you’ll see its value.
- You can right-click on a variable, then select “New Watch” to add it to your watch list.



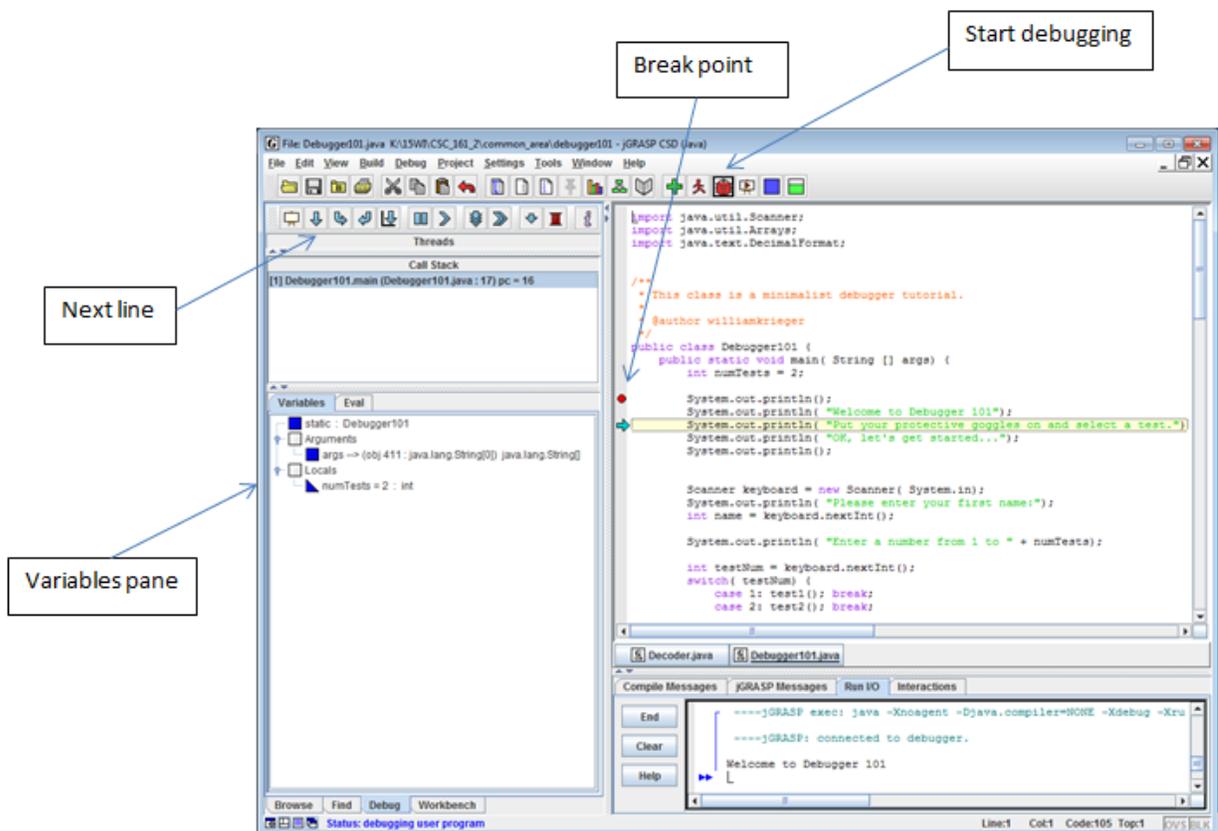
## jGrasp Debugging

I'm not a big JGrasp fan, but it's useful at times.

Here's their official PDF on debugging: [www.jgrasp.org/tutorials187/06\\_Debugger.pdf](http://www.jgrasp.org/tutorials187/06_Debugger.pdf)

And here's the magic:

- **Breakpoint** – click next to the line of code, creates red dot
- **Start debugging** – click the ladybug
- **Next line** – click the down arrow
- **Examine variables** – watch the Variables pane.



Are you an Eclipse-Head? If so, email me a screenshot like the ones above, and I'll add an Eclipse page here... crediting you, of course. thanks... yow, bill