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*Optional*

# Extending Python: Advanced Debugging

## Unit Programming

**Revision Date:** Mar 01, 2018

**Duration:** 75 50-minute sessions



### Lesson Summary

Summary: Teachers will practice debugging programs using a debugger. They will be introduced to debugging practices, such as setting breakpoints and stepping through a program.

Outcome: Teachers will

- Learn how to use PyCharm to debug Python programs
- Learn the various functionalities of the PyCharm debugger to help them debug programs

Overview:

Total time - 75 min

1. Recap - Types of Errors (5 minutes)
2. Debugging in PyCharm (25 minutes)
3. Instructions (2 minutes)
4. Debugging Activity (43 minutes)

### Learning Objectives

### Teacher Resources

Student computer usage for this lesson is: **required**

PROG10\_Extending Python: Advanced Debugging Folder (<https://drive.google.com/open?id=0B1v7pcLSD-B5ZlhEYU9EbEzTUGs>)

Keyboard Shortcuts for Running and Debugging in

PyCharm: <https://www.jetbrains.com/help/pycharm/2016.3/running-and-debugging.html>

(<https://www.jetbrains.com/help/pycharm/2016.3/running-and-debugging.html>)

How to Debug a Program in

PyCharm: <https://www.jetbrains.com/help/pycharm/2016.3/debugging.html>

(<https://www.jetbrains.com/help/pycharm/2016.3/debugging.html>)

There are 2 programs `debug_fizzbuzz.py` and `debug.py` to use for demonstration and practice with solution files provided.

## Lesson Plan

TOTAL: 75 minutes

### Recap (5 min)

The presentation on Advanced Debugging provides a guide for this lesson. Start by using the debugging guide to remind the teachers of the various types of errors.

### Debugging in PyCharm (25 min)

Load `debug_fizzbuzz` into PyCharm. Demonstrate the features of the debugger outlined in the presentation and described in "How to Debug a Program in PyCharm" on the [jetbrains.com](https://www.jetbrains.com) site. The instructor will debug a short program to demonstrate the various functionalities of the PyCharm debugger. The instructor will demonstrate setting breakpoints, configuring debugger options, starting the debugger session, pausing and resuming the debugger session, monitoring the debug information, examining a suspended program, exploring frames, finding the current execution point, and stepping through the program.

### Instructions (2 min)

Suggest that teachers leave the [jetbrains](https://www.jetbrains.com) debugging guide up in a browser so that they can refer to the references easily if they get stuck. Open `debug.py` in PyCharm.

### Debugging Activity (43 min)

The teachers will go through the Python file `debug.py` and debug it. If there is any confusion, the instructor should go through the first few errors with them to demonstrate/ remind the teachers how to debug. At the end, they will be shown the debugged solution, `fixed.py`

## Options for Differentiated Instruction

This is an optional lesson for advanced teachers who are already comfortable with the basic constructs of Python and want to dig in deeper.

## Evidence of Learning

### Formative Assessment

When stepping through the program, quiz the teachers. Ask them, "What do you think will happen? Which function will we go into?"



(<http://www.umbc.edu/>)



(<http://www.umd.edu/>)



(<http://www.nsf.gov/>)

*Authored by:* CS Matters in Maryland

*Website:* [csmatters.org](http://csmatters.org) (<http://csmatters.org>)

*Email:* [csmattersinmaryland@gmail.com](mailto:csmattersinmaryland@gmail.com) (<mailto:csmattersinmaryland@gmail.com>)

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