

(<http://csmatters.org/pd-new>) P - 07prog

0bP - 0b111

Python simulation, file i/o and data analysis



Unit Programming

Revision Date: Sep 10, 2019

Duration: 120 50-minute sessions

Lesson Summary

Summary: This is a good opportunity for those who are new to Python to explore another online, interactive tool for learning basic Python to strengthen their skills, and for those who are more familiar with programming to explore the features of file i/o and modeling and simulation.

Participants who are new to programming in Python can work through lessons in <https://codehs.com/info/curriculum/intropython> (<https://codehs.com/info/curriculum/intropython>), <https://www.codecademy.com/learn/learn-python-3> (<https://www.codecademy.com/learn/learn-python-3>), or <https://www.learnpython.org/> (<https://www.learnpython.org/>) (stick to Python version 3)

Participants who are confident in their Python programming skills can work through the Guided Activity on File I/O, paying particular attention to any modifications that they would make when deploying the lesson for their own classes. They will then discuss their findings in their groups. Time permitting, the instructor can introduce more I/O operations, such as stripping lines of whitespace or using a for loop to read in a file.

Objectives:

- Teachers will increase their understanding of Python by either
 - practicing basic Python skills
 - learn how Python handles files.
- Teachers will go through Lesson 4.4, and discuss possible improvements.

Overview:

1. Introduction (5 min)
2. Guided Activity (90 min)
3. Discussion (25 min)

Learning Objectives

Teacher Resources

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

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PROG07_Python Simulation, File I/O, and Data Analysis Folder
(<https://drive.google.com/open?id=0B5vAY-fhOT-iVlpYNnRrY0dMZzg>)

Lesson Plan

TOTAL: 120 min

Introduction (10 min)

Search for an online tutorial about Python file handling. Watch at least 5 minutes and be prepared to share your impression of its: value as a learning tool, suitability for students, level of student it addresses.

Guided Activity (90 min)

Choose one of these activities that is most suitable to your current level of understanding of Python programming.

1. Participants who are new to programming in Python can work through lessons in <https://codehs.com/info/curriculum/intropython> (<https://codehs.com/info/curriculum/intropython>), <https://www.codecademy.com/learn/learn-python-3> (<https://www.codecademy.com/learn/learn-python-3>), or <https://www.learnpython.org/> (<https://www.learnpython.org/>) (stick to Python version 3)
2. Participants who are confident in their Python programming skills can work through the Guided Activity on File I/O below, paying particular attention to any modifications that they would make when deploying the lesson for their own classes.
 1. Go to the link for "Python for Informatics", click on Interactive HTML on Trinket.io
 2. Click on Chapter 7: Files
 3. Open up another tab and navigate to Lesson 4.4 in the CS Matters Curriculum
 - Also open Pycharm or the Runestone coding environment and create a new .py file
 - Also have the two files: mbot.txt and mbox-short.txt saved in the same folder as their python file for the lesson.

Code code the examples in the book and take note of:

- What you like about the lesson
- What you would modify
- Any points of potential confusion for the students

Note: Take your time going through the lessons to give yourself extra time to consider modifications and additions to the lesson.

Discussion Posting (25 min)

Post about your experience in the online discussion group. Would you want to use these materials with your students? They might or might not want to use file i/o as part of their Create Task. Describe any modifications you would make to the lessons, as well as what you liked.

Options for Differentiated Instruction

Teachers can go through guided activity in pairs online and discuss as they work.

An idea to consider for student working in person on challenging material: work as a group on the Guided Activity. "Have students take turns around the room to read aloud the brief text in each section in Chapter 7. Do the short exercises together with a "row captain" assigned to each row (or group) in the classroom who is in charge of checking that everybody in their row has completed each short task and has gotten the help needed to finish. Row captains help each other until the entire class has successfully completed each task. Report out on what challenges were encountered, recording problems and solutions at the front of the classroom as the class works. Rotate the role of row captain for each section." - from CS Matters curriculum

For live-coding, students may have difficulty simultaneously listening to the instructor dictate the code, writing the code, and understanding what the code does. This occurs both in the classroom with students and in professional development sessions with teachers. As a method of differentiated instruction, mention that for students, an instructor can physically print the code that will be produced in the live-coding session for the students that exhibit this difficulty.



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



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



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

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