

POGIL Activity 4 (MA14): Files and Nesting Looping Structures

"Alternative input"

Original activity author: Lisa Olivieri. Modified by: Gina Sprint.

Recorder name: _____

Technician name: _____

Learning Objectives

Students will be able to:

Content:

- Explain how to open a text file for reading and for writing
- Explain the effect of the arguments of the range function when reading data from a file.
- Explain the purpose of the **strip()**, **open()**, **close()**, and **write()** functions
- Explain the difference between writing and appending to a file

Process:

- Write code that opens, writes to and closes a file
- Write code that opens, reads from and closes a file

Critical Thinking Questions:

FYI: In Python, you can access data from a text file as well as from the keyboard. You can create a text file in any text editing tool. I recommend you use Spyder to edit your text files.

1. In Spyder, create a text file named **sports.txt** and enter the sports listed below, *one word per line*. Enter and execute the Python program below. Be sure the saved program (.py file) is in the same folder as the text file (.txt file).

Python Program	sports.txt file
<pre>sports_file = open('sports.txt', 'r') for i in range(1, 21): sport = sports_file.readline() print(str(i) + ".", sport) sports_file.close()</pre>	<pre>basketball baseball football volleyball tennis golf lacrosse soccer badminton bowling skiing diving hockey ice skating biking rugby swimming sailing rowing skateboarding</pre>

- a. What does the program do? Explain the format of the output.
- b. Explain the purpose and syntax of the first line of code. What do the string arguments for the function **open()** represent? `sports_file = open('sports.txt', 'r')`

- c. What happens when you change the arguments in the **range()** function to **1, 10**?
- d. What happens when you change the arguments in the **range()** function to **0, 30**?
- e. What do the results from 1.c. and 1.d. tell you about the arguments of the **range()** function when you are using it in a FOR loop to read data from a file?

2. Enter and execute the following program:

```
sports_file = open('sports.txt', 'r')
i = 1
for sport in sports_file.readlines():
    print(str(i) + ".", sport)
    i += 1
sports_file.close()
```

- a. How does the output from this program compare to the output of the program in problem #1 that used **range(1, 21)**?

- b. What does the following line of code from the program above do?

```
for sport in sports_file.readlines():
```

FYI: The purpose of the **strip()** function is rather subtle. **strip()** returns a copy of the string after all characters have been stripped from the beginning and the end of the string (default whitespace characters and newline characters).

3. The following program is slightly different from the program in #2. Enter and execute the program.

```
sports_file = open('sports.txt', 'r')
i = 1
for sport in sports_file.readlines():
    print(str(i) + ".", sport.strip())
    i += 1
sports_file.close()
```

- a. Compare the output from this program to the output in the previous program (#2). What is the difference?

b. What code caused the difference in the output?

c. In this example the **strip()** function strips the newline character from the string that is read from the file. Why was the newline character attached to the end of the string?

4. Enter and execute the following program:

```
name = input("Enter student name: ")
student_ID = int(input("Enter ID number: "))
outfile = open("student_info.txt", "w")
outfile.write("Name: " + name + "\n")
outfile.write("ID: " + str(student_ID) + "\n")
outfile.close()
print("Done! File closed!")
```

a. What output appears on the screen?

b. What does the program do?

c. Locate the file **student_info.txt** on your computer. The file is stored in the same folder as the program. What is stored in the file?

d. What is the purpose of “w” in the following line of code?
outfile = open("student_info.txt", "w")

e. Did you have to create the file **student_info.txt** before you included it in the program?

- f. Execute the program again using different input. Open the **student_info.txt** file. What is in the file? Is the data from the first program execution still there?

- g. Change the “w” to “a” in the **open()** function. Execute the program again with different input. Examine the **student_info.txt** file. What did “a” as an argument in the **open()** function do? What word do you think “a” represents?

- h. Notice the new function – **write()**. How many arguments does the write function have? What is the argument *data type*?

- i. What line of code *closes the file*? Where is it located with respect to other lines of code that interact with the file? Why do you think it is located there?

- j. Application question: Revise the program so that the user can enter three names during one execution of the program. Use a loop! Note: You may need to change the order of some of the code. After your team codes up the correct solution, the **recorder should write the code here**: