

Old MacDonald's Farm

CSC 148: Introduction to Computer Science I

"Soft" due date: March 4, 2022 at 11:59 pm*

***An automatic extension will be given to anyone who needs it to Monday, March 14. However, I strongly recommended that you try to complete this assignment by Friday, March 4, and utilize the TA office hours and other help during that week before break.**



This week, we will write a python program that prints out the lyrics of a popular English-language song for small children called "Old MacDonald's Farm." Versions of this song are also found in many non-English languages. If you don't know this song, don't worry, you can find many versions of it on youtube! Try watching these videos to get the idea, but be sure to pay attention to the specific instructions for how the song should be produced in this assignment.

https://www.youtube.com/watch?v=_6HzoUcx3eo

<https://www.youtube.com/watch?v=IU7ouzDtZEM>

There are many different ways to sing this song, but we are going to use the lengthy "cumulative" version, which, with every new animal, goes back and recites, in **reverse** order, the sounds of all the preceding animals. See the sample output to understand how your song should be structured. This exercise will give you more practice reading files, looping through lists, and creating and using functions.

Part I: Make file of animals and sounds.

Using excel, create a file of animal names and their corresponding sounds to use in your program (put the animal in the first column and its corresponding sound in the second column, as seen in the example on the right). The song typically has the animal name in its singular form (e.g. cow instead of cows) and the sound in its onomatopoeia form (word that sounds like the sound itself, e.g. woof for a dog). Your file should have 6-10 animal-sound pairs, although you may want to use a much smaller file (2-3 pairs) for initial testing. Please feel free to use farm animal names and sounds used outside the Washington DC region! For example, did you know that, in France, a pig (couchon) goes "groin"?

	A	B
1	cow	moo
2	horse	neigh
3	pig	oink
4	chicken	cluck
5	sheep	baa

Save the file as a .csv file into a directory where you will be saving your python program.

Note: be sure you are saving your data file as a plain "Comma Separated Values" file, not the "UTF-8 format" or other special formats. If you use one of these special formats, it will insert encoding in the first few bytes of the file that will appear as garbage characters in front of the first animal name.

Part 2: Write the program to open the file, read in the data as a list of lists (each of the inner lists should consist of two strings, the animal and its sound), and then use the data to print out the lyrics of the song. You should save your program and your .csv file(s) in the same directory. Every program must have the functions main and show_song, as well as other functions to eliminate redundancy and allow you to insert lines in various places in the program. In addition to main and show_song, you may implement the functions described below (eio, oldMcLine, animal_line, and sound_lines) or use your own functions as you see fit.

(1) main function

Your main function should do the following:

- Prompt the user for the name of the file to open; open the file.
- Read the file into a list of animal-sound pairs, with each pair itself a list. Be sure to test your program to make sure that it is reading the file correctly.
- Call a function show_song that takes as a parameter the list of animal-sound pairs and prints the song.

(2) show_song function

The purpose of the show_song function is to construct the song out of its various parts. Remember that the song has a lot of repetition; the functions will allow you to avoid redundant code. My show_song function did the following:

- Go into a for-loop that iterates through the entire list of animal-sound pairs.
 - call oldMcLine
 - call animal_line with that animal name for the "And on that farm" line
 - go into a for-loop that works backwards from the current animal sound to the first, calling sound_lines with each animal sound. Note that to make the for loop go from the current animal to the animal with index 0, you must have a loop header that looks something like this:

```
for j in range(index,-1,-1):
```

The start argument is "index", the stop argument is -1, and the step is -1. The negative step allows you to count down from index and the -1 as the stop means that you go down to but not including -1, which of course gives you 0.

- call oldMcLine again

(3) other functions

You are invited to implement some or all of the following functions, but you are also welcome to come up with your own functions. Just be sure that you eliminate redundancy where possible.

eio() # prints the E-I-E-I-O line

oldMcLine() # prints the initial line of the verse, and calls eio()

animal_line(critter) # prints the "And on that farm he had a ..." line for an individual animal, and calls eio()

sound_lines(sound) # prints the "With a..." and the "Here a..." lines for the sound of an individual animal.

For example, if the string "moo" is passed to sound_lines, it will print:

With a moo-moo here, and a moo-moo there,
Here a moo, there a moo, everywhere a moo-moo,
(underlines above just indicate the string that was passed)

Your functions will not have any return values; they will just print the output to the console.

Below is an example of a run of the program, using the 8-entry csv file shown below:

```
[evaluate oldMac.py]
```

```
Enter the name of the file listing the animals on Old McDonald's farm: farmanimals.csv
```

```
Old MacDonald had a farm,  
E-I-E-I-O!  
And on that farm he had a cow,  
E-I-E-I-O!  
With a moo-moo here, and a moo-moo there,  
Here a moo, there a moo, everywhere a moo-moo,  
Old MacDonald had a farm,  
E-I-E-I-O!  
  
Old MacDonald had a farm,  
E-I-E-I-O!  
And on that farm he had a horse,  
E-I-E-I-O!  
With a neigh-neigh here, and a neigh-neigh there,  
Here a neigh, there a neigh, everywhere a neigh-neigh,  
With a moo-moo here, and a moo-moo there,  
Here a moo, there a moo, everywhere a moo-moo,  
Old MacDonald had a farm,  
E-I-E-I-O!  
  
Old MacDonald had a farm,  
E-I-E-I-O!  
And on that farm he had a pig,  
E-I-E-I-O!  
With a oink-oink here, and a oink-oink there,  
Here a oink, there a oink, everywhere a oink-oink,  
With a neigh-neigh here, and a neigh-neigh there,  
Here a neigh, there a neigh, everywhere a neigh-neigh,  
With a moo-moo here, and a moo-moo there,  
Here a moo, there a moo, everywhere a moo-moo,  
Old MacDonald had a farm,  
E-I-E-I-O!  
  
Old MacDonald had a farm,  
E-I-E-I-O!  
And on that farm he had a chicken,  
E-I-E-I-O!  
With a cluck-cluck here, and a cluck-cluck there,  
Here a cluck, there a cluck, everywhere a cluck-cluck,  
With a oink-oink here, and a oink-oink there,  
Here a oink, there a oink, everywhere a oink-oink,  
With a neigh-neigh here, and a neigh-neigh there,  
Here a neigh, there a neigh, everywhere a neigh-neigh,  
With a moo-moo here, and a moo-moo there,  
Here a moo, there a moo, everywhere a moo-moo,  
Old MacDonald had a farm,  
E-I-E-I-O!  
  
Old MacDonald had a farm,  
E-I-E-I-O!
```

	A	B
1	cow	moo
2	horse	neigh
3	pig	oink
4	chicken	cluck
5	sheep	baa
6	dog	woof
7	bee	buzz
8	turkey	gobble

And on that farm he had a sheep,
E-I-E-I-O!
With a baa-baa here, and a baa-baa there,
Here a baa, there a baa, everywhere a baa-baa,
With a cluck-cluck here, and a cluck-cluck there,
Here a cluck, there a cluck, everywhere a cluck-cluck,
With a oink-oink here, and a oink-oink there,
Here a oink, there a oink, everywhere a oink-oink,
With a neigh-neigh here, and a neigh-neigh there,
Here a neigh, there a neigh, everywhere a neigh-neigh,
With a moo-moo here, and a moo-moo there,
Here a moo, there a moo, everywhere a moo-moo,
Old MacDonald had a farm,
E-I-E-I-O!

Old MacDonald had a farm,
E-I-E-I-O!
And on that farm he had a dog,
E-I-E-I-O!
With a woof-woof here, and a woof-woof there,
Here a woof, there a woof, everywhere a woof-woof,
With a baa-baa here, and a baa-baa there,
Here a baa, there a baa, everywhere a baa-baa,
With a cluck-cluck here, and a cluck-cluck there,
Here a cluck, there a cluck, everywhere a cluck-cluck,
With a oink-oink here, and a oink-oink there,
Here a oink, there a oink, everywhere a oink-oink,
With a neigh-neigh here, and a neigh-neigh there,
Here a neigh, there a neigh, everywhere a neigh-neigh,
With a moo-moo here, and a moo-moo there,
Here a moo, there a moo, everywhere a moo-moo,
Old MacDonald had a farm,
E-I-E-I-O!

Old MacDonald had a farm,
E-I-E-I-O!
And on that farm he had a bee,
E-I-E-I-O!
With a buzz-buzz here, and a buzz-buzz there,
Here a buzz, there a buzz, everywhere a buzz-buzz,
With a woof-woof here, and a woof-woof there,
Here a woof, there a woof, everywhere a woof-woof,
With a baa-baa here, and a baa-baa there,
Here a baa, there a baa, everywhere a baa-baa,
With a cluck-cluck here, and a cluck-cluck there,
Here a cluck, there a cluck, everywhere a cluck-cluck,
With a oink-oink here, and a oink-oink there,
Here a oink, there a oink, everywhere a oink-oink,
With a neigh-neigh here, and a neigh-neigh there,
Here a neigh, there a neigh, everywhere a neigh-neigh,
With a moo-moo here, and a moo-moo there,
Here a moo, there a moo, everywhere a moo-moo,
Old MacDonald had a farm,
E-I-E-I-O!

Old MacDonald had a farm,
E-I-E-I-O!
And on that farm he had a turkey,
E-I-E-I-O!
With a gobble-gobble here, and a gobble-gobble there,
Here a gobble, there a gobble, everywhere a gobble-gobble,

With a buzz-buzz here, and a buzz-buzz there,
Here a buzz, there a buzz, everywhere a buzz-buzz,
With a woof-woof here, and a woof-woof there,
Here a woof, there a woof, everywhere a woof-woof,
With a baa-baa here, and a baa-baa there,
Here a baa, there a baa, everywhere a baa-baa,
With a cluck-cluck here, and a cluck-cluck there,
Here a cluck, there a cluck, everywhere a cluck-cluck,
With a oink-oink here, and a oink-oink there,
Here a oink, there a oink, everywhere a oink-oink,
With a neigh-neigh here, and a neigh-neigh there,
Here a neigh, there a neigh, everywhere a neigh-neigh,
With a moo-moo here, and a moo-moo there,
Here a moo, there a moo, everywhere a moo-moo,
Old MacDonald had a farm,
E-I-E-I-O!

As you can see, it can get quite lengthy, even with small lists! Have fun with this and use whatever animals you like. Feel free to consult the internet to find out what sounds are usually associated with particular animals in English, or if you know a language that uses different sounds, you may use those!

Challenge problem (optional):

If you finish quickly, challenge yourself by making another program that uses a file to supply details to a function that prints out the lyrics of another "cumulative" type song. Examples include "The Twelve Days of Christmas", "There Was an Old Lady Who Swallowed a Fly" or "The Wheels on the Bus."



What to hand in:

Complete this assignment by uploading your program, at least one .csv file with animal sound pairs, and your log file as directed in the Programming4 Assignment "quiz" on Canvas.

Your log file **MUST** match your program. If you change anything about your program, be sure to create a new log file.

In addition to uploading the files, you will be asked to answer some reflection questions about the assignment. Please answer all questions; this is part of the assignment.

HONOR CODE: Please remember that your work on this assignment must be your own. You may get help from the TAs, and you may discuss the problem with other students or friends and family members, but you may not share code or look at code written by anyone else (other than the sample programs from class or the textbook). In addition, you **MAY NOT** use internet resources such as stackoverflow (garbage advice) or Chegg (blatant cheating). The honor code applies for all programming assignments.