Intermediate Python **Homework 4**
Due: 11:59 PM Sunday, November 29, 2020 **This is an individual assignment.**

Part 1: hw41.py
Write a script named hw41.py to do the following. Download the file 'pop.csv' for this assignment (you've used this file before). Read the file 'pop.csv' into a list of strings (i.e., don't split the strings) named ***states***. Display states.

Write regex expressions for each of these problems. Run each pattern separately on the entries of states and display any matches.

1. Display the line containing 'Oregon'
2. Display all lines containing 'O'
3. Display all lines containing 'O' or 'P'
4. Display all lines beginning with '1'
5. Display all lines ending with '0'
6. Display all lines containing any letter from s to z in upper or lower case.
7. Display all lines containing one or more 0's together.
8. Display all lines containing 5, 4, and 3 in order, but not necessarily next to one another.
9. Display all lines whose states have a space in their name (like 'New York')
10. Display all lines whose states have two or more i's in their name in any case.

Part 2: hw42.py
This problem gives you practice with using an API and with pandas DataFrame. Write a script called hw52.py to do the following.

First, review the example code from the Lecture 8 notes on using the Google Books API. Then, if you have not actually tried the lab problem for API usage, you should go back and do so. Next, write a script by copying the relevant parts of the lab code and modify it to do these things:
1. Create a list with these topic strings: Python; Data Science; Data Analysis; Machine Learning; and Deep Learning. Use these topics, one at a time, to query the Google Books API.
For each returned JSON string:
2. Convert the JSON string to a dict using `loads( )` (as in the lab), then use this to convert it to a DataFrame: `pd.io.json.json_normalize ( thedict['items'] )`
3. Extract just the `'volumeInfo.title'` and `'volumeInfo.authors'` columns.
4. Relabel those two columns as 'Title' and 'Authors'.
After creating the five DataFrame objects, use `concat( )` to create one table called ***bigTable*** (use `ignore_index=True`). The function takes a list of the DataFrames to concatenate (i.e., in [ ]'s).
5. Display bigTable.
6. Re-display bigTable in the following way. Create the table headers (left justified), then use a for loop over bigTable.index, which will count on the index number starting at 0. Display at most 25 characters of the title (just use [:25], even if the title has fewer characters and only the first author. It should look something like this:

```
Title                      Author
Automate the Boring Stuff  Al Sweigart
Python                     Joseph Eddy Fontenrose
Python Data Science Handb  Jake VanderPlas
Python for Everybody       Charles R. Severance
```