Additional Information on Project 3 Step 10

After you read in the data file using pandas' "read_csv" you have a data structure known as a data frame. This looks a lot like a 2D list, but it isn't actually a 2D list.

The data frame looks like this:

Country	3/1/2020	3/2/2020	3/3/2020	3/4/2020	3/5/2020	3/6/2020	3/7/2020
US	74	98	118	149	217	262	402
Spain	84	120	165	222	259	400	500
Italy	1694	2036	2502	3089	3858	4636	5883
United Kingdom	36	40	51	85	115	163	206

To make Step 10 work, you're going to have to have a table that looks like this:

Country	Date	Cases
US	3/1/2020	74
US	3/2/2020	98
US	3/3/2020	118
US	3/4/2020	149

So here's how you create the new table.

Step A: convert the existing data frame to a 2D list:

Use the python/pandas command "tolist()" to do the conversion. If the variable name for your dataframe is "dataframe", you would type:

two_d_list = dataframe.values.tolist()

The variable two_d_list is now a standard Python 2D list, just like you've been working with for much of this semester.

Step B: Create a new 2D list in the right format.

Here's where your Python coding skills come in handy. You want to create a new 2D list, called new_list in this example. (Replace that with whatever you call your variable.)

Each element in new_list is a list with three elements - a country name, a date, and the number of cases in that country on that date.

You're going to have to use nested loops. The inner loop will walk through each row in two_d_list, your original list, and create an entry in new list containing two_d_list[j][0] (the country name in row j(, then the date from two_d_list[0][i] (the date from column i in row 0, the header row), and then the number of cases from two_d_list[j][i].

So, the inner loop processes ONE row. The outer loop executes the inner loop for EACH row in the original list, two_d_list.

Step C: convert new_list to a new data frame so that you can plot the graph
Plotnine works best with a dataframe, so you'll have to convert new_list to a data frame. Fortunately, that's easy. It takes the following two commands:

```
new_frame = pandas.DataFrame(new_list)
new_frame.columns = ["Country", "Date", "Cases"]
```

Replace "new_list" and "new_frame" with whatever you call your variables.
Now you're done, and you can just create a ggplot object and plot the graph.