Assignment 5

Your assignment is to create a tool that allows the user to analyze live state-level data on the coronavirus (COVID-19) pandemic. Your program should ask the user which location (state) they would like to search and which statistic they would like to search. Optionally, the user should be able to enter a start date and/or end date for their search. Your program should print a table of the results of the user's search and show an accompanying bar graph. Your program should allow the user to perform an unlimited number of analyses.

The COVID Tracking Project maintains live and historical records on the coronavirus (COVID-19) pandemic in the United States, accessible at https://covidtracking.com/api/v1/states/daily.json. The data is formatted as a JSON array and is similar to the datasets you have worked with on your past few assignments. An example of the formatting is below:

[
{"date":20200403,"state":"AK","positive":157,"death":3,"hospitalized":15,"totalTestResults":6016,"deathIncrease":0,"hospitalizedIncrease":6,"positiveIncrease":14,"totalTestResultsIncrease":994},

...

{"date":20200304,"state":"WI","positive":1,"totalTestResults":20,"deathIncrease":null,"hospitalizedIncrease":null,"pos itiveIncrease":null,"totalTestResultsIncrease":null}

Your tool should ask the user for the following:

- A location (state) to search. In the JSON data, states are abbreviated with capitalized two-letter acronyms. For example, "CA" refers to California.

- A statistic to search. The dataset contains several statistics in each record. For example, "positive" refers to the total number of confirmed positive cases; "death" refers to the number of deaths; "totalTestResults" refers to the total number of people tested; etc.

- A start date for the search. First, ask the user if they would like to include a start date. Then, if the user answers "yes", then ask the user which start date they would like to use. Dates are stored in the JSON data under the "date" field as integers in YYYYMMDD format. For example, April 1, 2020 would be stored as 20200401. If the user does not want to use a start date, a possible approach is to use a start date of -999999999.

- An end date for the search. First, ask the user if they would like to include an end date. Then, if the user answers "yes", then ask the user which end date they would like to use. If the user does not want to use an end date, a possible approach is to use an end date of +999999999.

Please handle all user inputs case-insensitively. For example, a search for “positive” and a search for “poSiTiVE" should yield the same result. An important consideration is that the JSON data downloaded from the COVID Tracking Project uses some field names that are entirely lowercased (e.g., “date”, “positive”) and some that include a mix of lowercase and uppercase letters (e.g., “totalTestResults”, “positiveIncrease”). Assuming that the requests data from the COVID Tracking Project API is stored in a variable called response, a simple solution is to use response.text.lower() to convert all field names to lowercased versions.

Due to data availability, some fields in your dataset may be missing values (an example of this appears above in the Wisconsin data for 03/04/2020). The json module will use a value of None for these missing values. In these cases, please treat None as equivalent to 0.

Some considerations to note:

- Consider the possibility that the user requests a statistic that is not present in your dataset. In this case, print out an appropriate message stating that the statistic was not available and asking the user to try again.

- Consider the possibility that, when loading the dataset, some connection issue occurs (that is, a status code other than 200). Ensure that your code handles this case and provides the user with a helpful printout if it does occur.

- The examples on the following pages use rotated labels on the x-axis to improve the legibility of the bar graphs. To adjust this setting for the x-axis labels in matplotlib, plt.xticks(rotation = 90, ha = "right") was used. This is optional.

- Ensure that your prompts and output are crisp, professional, and well-formatted. For example, ensure that you have used spaces appropriately and checked your spelling. Ensure that graphs are appropriately titled and that axes are appropriately labeled.

- Adding comments in your code is encouraged. You may decide how best to comment your code. At minimum, please use a comment at the start of your code to describe its basic functionality

Please use the following as a template for the tool’s expected functionality. Please note that these analyses were performed as of 04/04/2020. Since the API provides live data, you may observe slightly different results if you run these analyses in the future:

Welcome to the coronavirus (COVID-19) live data analyzer!

Which location would you like to search? CA

Which statistic would you like to search? Positive

Would you like to add a start date (yes/no)? yes

Which start date would you like to use (YYYYMMDD)? 20200401

Would you like to add an end date (yes/no)? no

Coronavirus in CA between 20200401 and 20200404: Positive

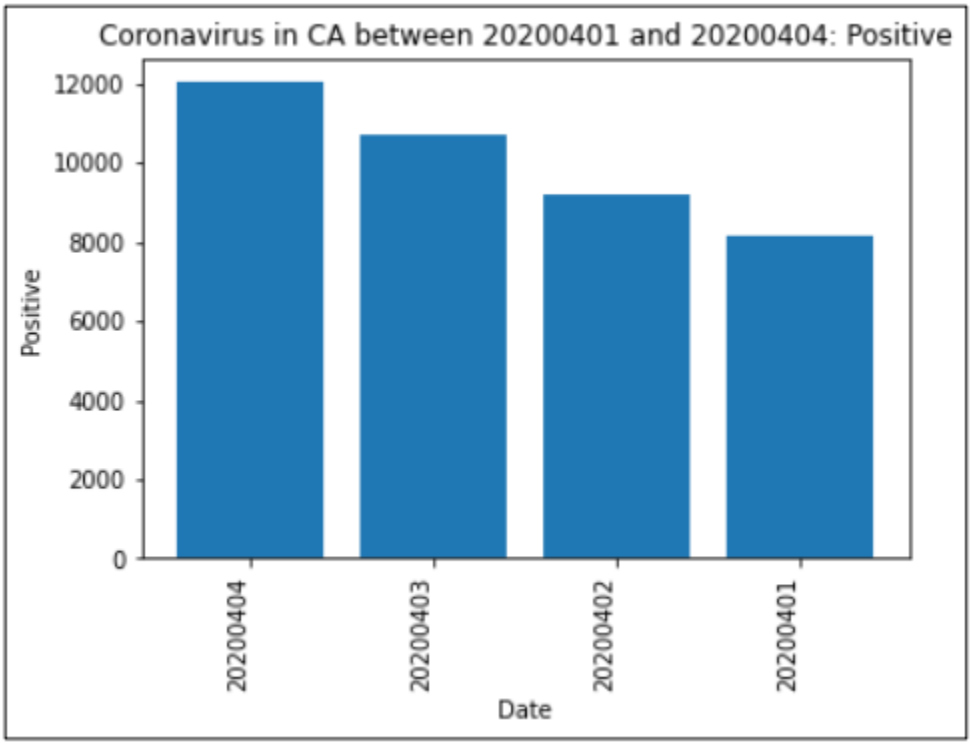
Date Positive

20200404 12026

20200403 10701

20200402 9191

20200401 8155



Perform another analysis (yes/no)? yes

Which location would you like to search? NY

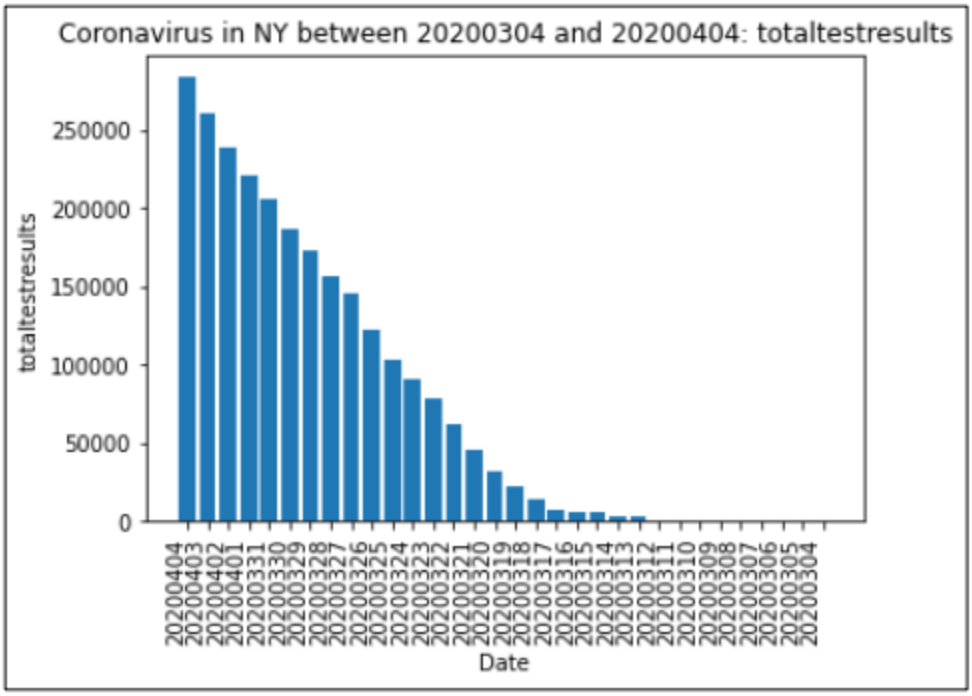
Which statistic would you like to search? totaltestresults

Would you like to add a start date (yes/no)? no

Would you like to add an end date (yes/no)? no

Coronavirus in NY between 20200304 and 20200404: totaltestresults

Date	totaltestresults
20200404	283621
20200403	260520
20200402	238965
20200401	220880
20200331	205186
20200330	186468
20200329	172360
20200328	155934
20200327	145753
20200326	122104
20200325	103479
20200324	91270
20200323	78289
20200322	61401
20200321	45437
20200320	32427
20200319	22284
20200318	14597
20200317	7206
20200316	5493
20200315	5272
20200314	3303
20200313	3200
20200312	308
20200311	308
20200310	265
20200309	234
20200308	197
20200307	168
20200306	125
20200305	98
20200304	54



Perform another analysis (yes/no)? yes

Which location would you like to search? WA

Which statistic would you like to search? positiveincrease

Would you like to add a start date (yes/no)? no

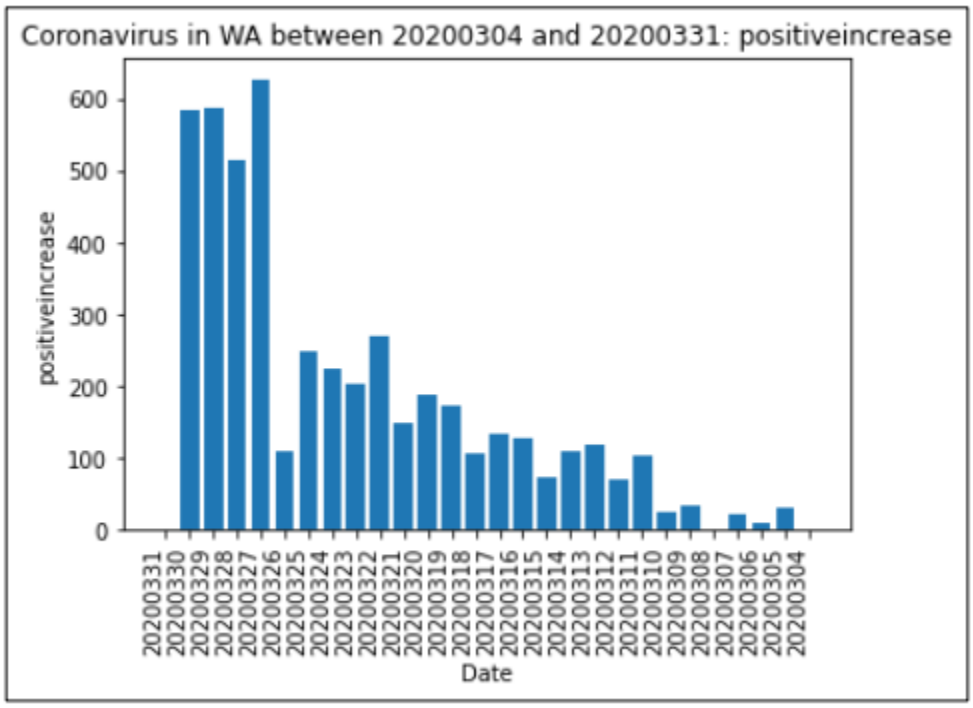
Would you like to add an end date (yes/no)? yes

Which end date would you like to use (YYYYMMDD)? 20200331

Coronavirus in WA between 20200304 and 20200331: positiveincrease

Date positiveincrease
20200331 0
20200330 586
20200329 587
20200328 516
20200327 627
20200326 111
20200325 248
20200324 225
20200323 203
20200322 269
20200321 148

20200320 189
20200319 175
20200318 108
20200317 135
20200316 1276
20200315 74
20200314 111
20200313 120
20200312 70
20200311 105
20200310 26
20200309 34
20200308 0
20200307 23
20200306 9
20200305 31
20200304 0



Perform another analysis (yes/no)? no