Program 1
CSCI232
Due 10/12/22

Purpose: To use a minimum priority queue and a binary search tree to process real world data.

Your program will read the file covid_data_world.csv (in d2l labs and programs folder). This data contains covid data from all countries (I think) on a daily basis from the start of covid to 9/22/2022. You are to read in this data and put in a minimum priority queue for each country (you will use one MinPQ and process one country at a time), saving the top 3 number of new cases for a day for each country. Place these 3 top entries for each country in one binary search tree. The key for this tree will be the number of new cases. (If there are more than 1, just save the first key/value combo). Your program will print the tree in order from smallest tolargest new cases for one day and write this to an output file. Each line must include the continent, country, day of largest number of cases, total covid cases on that day, current number of covid cases on that day and the population of the country on that day.

You can write your own MinPQ and Binary Search Tree or you can use an existing one. Regardless of which you choose, you will need comments at each set of computations hroughout the code telling whateach method/class is doing. And you must include a comment to cite where these data structures came from.

You must write the client (main program) yourself.

Data:

The data came from Our World In data on 9/23/2022 from https://ourworldindata.org/coronavirus-source-data.

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Submission:

You will submit all source files, the output file and a screenshot showing asuccessful execution of your program.

Rubric for program:

- 5 points – style – proper indention
- 10 points – comments explaining what every task or set of computations is doing – this is the proof that you understand the code you picked up or wrote.
- 20 points – program runs correctly
- 5 points – all the data attributes in your classes are private.
- 10 points – provide the output file showing all data sorted from smallest number of cases to largest number of cases over the entire world.
- 10 points – The output file must be sorted by new cases and each line in the output file will be include the continent, country, day of largestnumber of cases, total covid cases on that day, current number of covid cases on that day and the population of the country on that day. There must be words to explain what each item on the output line is. Example:
  ```
  New cases: 132 at Anguilla/North America on 5/16/2022 Total: 3116 Pop: 15753
  ```
- 10 points – used a MinPQ (must be named MinPQ) to determine the top 3 case days for each country
- 10 points – use a Binary Search Tree (must be named BinarySearchTree or BST) to store all the countries' data (top 3 cases for eachcountry)
- 10 points – the file called owid-covid-data.csv (in d2l) was used as your input
- 10 points – you must write the client (which uses the MinPQ and Binary Search Tree) to produce the required output and have it in a separate class/file (not attached to one of your data structures).
- You will get a 0 if you:
  - Did not submit the source code
  - Did not make your binary search tree generic
  - Used built in java data types for any type of tree or minPQ queue. (Be careful if you are getting a binary search tree or minPQ from the internet). BUT, you can use an arraylist as an iterable to pass back to your driver for printing out the tree.