Assignment 02

You are given a single csv file with city and temperature information. The file holds 6 cities and the high, low, and average temperatures for the year. The file looks like this (it is provided as a link on the assignment).

Boston,94,-15,65
Chicago,92,-21,72
Atlanta,101,10,80
Austin,107,19,81
Phoenix,112,23,88
Washington,88,-10,68

Write a ***main(int argc, char** argv)*** program that will do the following in order:

1. Read the file given from the command line and place the information in TWO different arrays. One 1-dimensional array of strings (or a 2D array of characters) and one 2-dimensional array of integers.
2. Print out the information from the arrays showing you read in the file correctly. Format your output so it is “neat.”
3. Sort the 2D array of temperatures in order of average temperature. You must sort the whole row (i.e. do not move just the average column alone) and you must also sort the array of city names along with it. In other words, the two arrays are parallel arrays (as discussed in class). You may use any sort algorithm you like.
4. Print out the information from the arrays showing you sorted correctly. Format your output so it is “neat.” Hint: you should just call the print function you should have made for step 2.
5. Rotate the 2D array of temperatures so that there are 3 rows and 6 columns with the rows being high temps, low tems, average temps in that order. In other words, your array will go from

this

94	-15	65
88	-10	68
92	-21	72
101	10	80
107	19	81
112	23	88

to this

94	88	92	101	107	112
-15	-10	-21	10	19	23
65	68	72	80	81	88

6. Print out a list of cities and average temperatures in order. Format your output so it is “neat.”
7. Search for the city with the average temperature of 81 and print the city name for that average temperature. You must use binary search to do this. In other words, you will pass to a binary search function the 2D array of temperatures, the size of the array, and

the search value 81, and it will return the column number, which will then be used to print the city name.

8. Answer this question in a comment in your code… When you sorted the temperature array, you had to also sort the city name array with it. When you rotated the temperature array, you did not have to alter the city name array. Why?

You must use proper file and program modularity (i.e. header file(s), function calls, etc.). Each of the steps above should be a call to a function from main. Pass the information you need to a function, perform that task, and return. In other words, your main should be relatively small and just call each function “read file,” “print arrays,” “sort arrays,” etc.

You may use any structures you like to support these tasks.

To rotate a 2D array, you must create another array with transposed sizes and copy from the original array to the transposed (rotated) array. In other words, unlike sorting, you cannot transpose (rotate) in place.

Make sure you conform to the Submission Guidelines.