**Problem #1**

**City Heat**

In this problem, you are given a file containing temperature information of different cities of Bangladesh. You need to perform some processing on this information and store the processed information into some other files. Read the input file and store the information of each city in an appropriately designed structure. To create an array of structures, use dynamic memory allocation. (And release the memory after your work is done). Also, after processing of a file is done, remember to close it.

Following information is stored in the different input files:

* **cities.txt**: Line #1 contains the total number of cities, *n*. Each of next *n* lines contains the city name (no spaces, max length is 20 characters) and a unique identifier of the city (call it city Id.). You cannot assume anything about the city identifier, except that it is an integer that fits within 32-bit integer of C.
* **{max.txt, min.txt, avg.txt}**: Each of these files contains *n* lines. Each line contains city id. Followed by temperature (real) information. max.txt contains the maximum temperature of each city, min.txt the minimum temperature; and avg.txt the average temperature. **No particular ordering can be assumed about the data.**

Your output is another file as described below:

* **cityTemps.txt**: This file should contain city temperature information in lexicographical order of city names. For each city, a line contains city name, followed by max, min and average temperatures respectively.

Write the necessary code. Then write necessary data files (using notepad) to test your code rigorously. Then ask your teacher to evaluate your assignment. A sample set of data files and corresponding output file is provided below

|  |  |  |  |
| --- | --- | --- | --- |
| **cities.txt** | **max.txt** | **min.txt** | **avg.txt** |
| 4  Dhaka 1552389  Chittagong 2323456  Rajshahi 5463782  Khulna 2484090 | 1552389 35.25  5463782 41.59  2484090 33.50  2323456 32.75 | 2484090 9.00  1552389 10.25  2323456 12.28  5463782 4.50 | 5463782 37.50  1552389 32.70  2323456 30.67  2484090 32.00 |

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| --- |
| **Output file: cityTemps.txt** |
| Chittagong 32.75 12.28 30.67  Dhaka 35.25 10.25 32.70  Khulna 33.50 9.00 32.00  Rajshahi 41.59 4.50 37.50 |