Homework 1

100 Points

One Dimensional Arrays

22B_H_1A.cpp – Binary Search: Find and fix errors
22B_H_1B.cpp – Insertion Sort: Find and fix errors
Pr8-3_BinS.cpp – Binary Search: Code Review
22B_H_1C.cpp – Search a Sorted List of Strings

Project: Searching a Sorted List of Strings using Binary Search

The input file countries.txt contains up to 200 lines. On each line there is a country code (a unique identifier) followed by the country's population and name. You may assume that the countries in the input file are sorted by the country's code as shown below:

```
AU 20090437 Australia
BR 186112794 Brazil
BU 7262675 Bulgaria
CA 32805041 Canada
```

Create the input file using data on the next page. Read data from file into three parallel arrays. Use arrays of maximum size 200. In case the input file contains data for more than 200 countries, print an error message such as "The file contains more than 200 lines!" and terminate the program.

Change the Binary Search function to search the parallel arrays, then test it in a loop as it is shown in **Program 8-3**. Prompt the user to enter a country code, such as **CA** then call the Binary Search function to search for **CA**. If found, display its name and population, otherwise display an error message. Keep track of the number of searches for each country in another array. When done searching, write the arrays to an output file named results.txt, as shown below.

```
 3 AU Australia (20090437)
 2 BR Brazil (186112794)
 0 BU Bulgaria (7262675)
10 CA Canada (32805041)
```

The first number on the first line, 3, shows that there were 3 searches for **AU**, the first number on the second line, 2, shows that there were 2 searches for **BR**, and so on.

Grading

Program 1A	– 15Points
Program 1B	– 20
Program Pr8-3_BinS	– 10
Program 1C	– 50
Self Assessment Report	– 5

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Grading Program 1C – 50

Read data from file into arrays	– 10Points
Binary Search	– 10
Test Binary Search (loop)	– 10
Create the new array (frequency array)	– 10
Write arrays to a file	– 10

Run each program once and save the output at the end of the source file as a comment. Compress the source files, input and output files (if any), and the report, and upload the compressed file: 22B_LastName_FirstName_H1.zip

Self Assessment Report: Write a short report, (see 22B_H_1Report.doc form) briefly explaining your code and containing an assessment of your implementation based on the above grading criteria.

Create the input file countries.txt using the following data:

```
AU 20090437 Australia
BR 186112794 Brazil
BU 7262675 Bulgaria
CA 32805041 Canada
CN 1306313812 China
DO 8950034 Dominican Republic
EG 77505756 Egypt
ES 40341462 Spain
FJ 893354 Figi
FR 60656178 France
GR 10668354 Greece
HU 10006835 Hungary
IR 68017860 Iran
JA 127288419 Japan
LI 33717 Liechtenstein
MC 32409 Monaco
MU 1230602 Mauritius
MX 106202903 Mexico
NP 27676547 Nepal
RU 143420309 Russia
US 295734134 United States
```