Program 4

CS2010 25 pts

Spring, 2018 Due: 11:59pm, Wednesday, February 28, 2018

Write a Visual C++ program to read in Internet usage data from a file and create a report to summarize the data. This program gives you practice with using text files for input and output. You will also use loop algorithms for finding a total, average and highest value.

When you are ready to type in your program, create a new C++ project in Visual Studio using your last name, first initial and pgm4 as the project name and C++ file name (e.g., **IrvingK\_pgm4** and **IrvingK\_pgm4.cpp**). Name the report file your program creates **pgm4rpt.txt**.

**Input:** Data about each area of the world is stored in a file called **pgm4.txt**. Your program should read in an area name and three numbers representing the population, number of Internet users in 2000 and number of current Internet users for that area. After processing the data for one area, your program should read in the data for the next area and so on.

Copy the file **pgm4.txt** from Canvas into your project folder. The data in the file includes four lines for each area with the area name followed by the three numbers. Assume that you do not know the number of areas ahead of time so your program should be able to handle any amount of data that may be in the file. The first couple of lines look like this:

Africa

1013779050

4514400

110931700

Asia

3834792852

. . .

**Program Processing Steps:**

1. Your program should first open the input file (to read the data from) and an output file (to write the report to) and check the success of each of these operations. Also, do any initialization of variables required and print the headings for your report to the output file.

2. Use a *while* loop to:

1. Read in the name, population and Internet usage values for an area.
2. Find the penetration and growth percentages for the area using the formulas below.

Current Internet Users Current Internet Users – Internet Users 2000

Penetration % = ------------------------ Growth % = ------------------------------------------------- Population Internet users 2000

1. Print a line showing the area name, population and Internet usage numbers and penetration and growth percentages.
2. Add this area's values to the appropriate totals.
3. Decide whether this area has higher values for the population, current Internet users or the percentages.

3. After all area data has been read in and processed, print the summary data (see sample output on next page).

**Output:** Here is a sample of what your output should lint ook like.

World Internet Usage Report

Your name, CS2010, Class time

Internet Users Penetration

Area Population 2000 Current (% Pop) Growth %

-------------------------------------------------------------------

Africa 1013779050 4514400 110931700 10.9% 2357.3%

Asia 3834792852 114304000 825094396 21.5% 621.8%

... ... ... ... ... ...

... ... ... ... ... ...

-------------------------------------------------------------------

Total/Avg% xxxxxxxxxx xxxxxxxxx xxxxxxxxxx xx.x% xxx.x%

Area with highest population: xxxxxxxxxxxxx

Population: xxxxxxxxxx

Area with most Internet users: xxxxxxxxxxxxx

Number Users: xxxxxxxxxx

Area with highest Internet penetration: xxxxxxxxxxxxx

Penetration %: xx.x%

Area with highest Internet usage growth: xxxxxxxxxxxxx

Growth %: xxx.x%

**Program Documentation & Style -** Follow the standards described in previous assignments.

**Follow these steps for developing your program.**

1. Carefully read through the processing steps on the first page. I would suggest that you plan, write out, type and test your code for one thing at a time. For example, the first step to write out and type in could be the code to open the input file and the loop to read in the data from this file. Just use cout statements to display the data on the screen to see if the area names and numbers were read in correctly.

Once your input loop is working, add the code to open the output file and write the area names and numeric data to this file. Then include the headings, find the totals, etc. Once your file output is correct, neatly format your results.

2. Type in your comments and C++ statements.

3. Run, test and debug your program one step at a time until it correctly displays the results.

4. When you are satisfied that your program is producing the correct output you need to turn in ONLY the .cpp file from the project on Canvas.

**Rubric**

Project named correctly, .cpp file turned in on Canvas.

2 Header/inline comments complete

1 Uses good program style (meaningful data names, white space, indentation)

4 Correctly reads in each area name, population and Internet usage data from the **pgm4.txt** file.

5 Writes output to report file, report includes title, your name/class/class time, column headings, data for each area all on one line, aligned neatly in columns, summary data displayed with descriptive labels.

4 Penetration, Growth percentages for each area correct.

5 Total population, Internet usage, average penetration, growth totals correct.

4 Highest and average values correct.

**25**  **Total Points**