CS 301 Data Structures and Algorithms

Homework 1

The purpose of Homework 1 is brushing up C++ skills and warming up for future programming assignments. Vectors are ***not*** allowed. Linkedlist in C++ library should ***not*** be used. The program has the following functionality:

1. Once it starts, it takes the input file name as an argument from commandline.
2. The program uses the file name to open the file. The file has a number of lines. Each line has two numbers separated by a comma. Therefore, there are actually ***two columns*** of numbers. For example:

   312312, 56877
   2267, 3698
   3, 3478
   87907, 768

3. The program processes the input data to calculate the average value of all valid numbers in the first column and the largest value of all valid numbers in the second column. The print out should be
   The average value of all numbers in the first column: *XXX.XXXX*
   The largest value of all numbers in the second column: *XXXXX*
   The total number of rows in the file is: *XXXX*
   The invalid numbers are: XXX, XXX, XXX, …

Requirements:

1. ***[will be 0 if it does not compile or crash when "make" it]*** The homework must be done in C++ and compatible to C++11. Your submission must be in a .zip or .tar.gz file. You homework must be compiled and run using the given Makefile. Failing to meet the requirements in this section will result in 0.
2. [5%] The Following identification information must be included at the beginning of your cpp file.
   //Name: XXXXXXX
   //NetID: ab1234
   //Email: XXXX@csueastbay.edu
3. [5%] The output average value should retain 4 decimal digits.
4. [10%] The program must use *cin* and *cout* to deal with command line input and output.
5. [10%] The program must ask user to input again without crashing file name is invalid.
6. [10%] You can only use array (no vectors, no linked list, actually you also can do it only with loops…) to solve this.
7. [30%] Students must implement loops by themselves to calculate the average and to find the largest value, invalid numbers, and number of rows.
8. [30%] There are invalid numbers (like *1P24*…) in the input data file, make sure those numbers will be recognized and abandoned automatically by your program without crashing.