LAB 9 – Chapter 9

Thursday, March 24, 2016

Directions:

You are working on a research project studying if Netflix interferes with student's performance in college. You decide to write a program that will gather statistical data about the number of hours college students spend watching streaming videos on Netflix in one month.

Specifications/Rules:

Functions

Below you will find details of what should happen in each function. Make sure to follow the specifications! The main function should be defined in **`netflix.cpp`** and all other programmer-defined functions should be defined in **`functions.cpp`**. All #include files, using namespace std;, and function prototypes should be in **`netflix.h`**. At the top of both Netflix.cpp and functions.cpp you should have an include that looks like this:

```
#include "netflix.h"
```

IN ALL FUNCTIONS USE POINTER NOTATION INSTEAD OF ARRAY NOTATION!!

Function: main

1. Ask the user how many students were surveyed.
2. Call a function called **makeArray** to define an array of integers with the number of elements equal to the number of students surveyed.
3. Call a function called **getStudentData** to allow the user to enter the number of hours each student spent watching Netflix into the array.
4. Call a function called **getAverage** to calculate and display the average of the hours entered.
5. Call a function called **selectionSort** to sort the hours in ascending order. This function is provided for you.
6. Call a function called **printArray** to print out the hours in the array.
7. Call a function called **getMedian** to calculate and display the median of the hours entered.
8. Print out a tab and then the header "NETFLIX STATISTICS" in all capital letters, then skip down to the next line and then print out the average & median.
    a. The labels "Average:" and "Median:" should all have a colon ":" after the word and have a field width of 9.
    b. The value for average & median should have two numbers after the decimal point. Mean should not have a decimal point because the value should reflect the number of hours a student watched streaming videos.
    c. The labels and the values should all be left aligned.

Function: makeArray

Define an array of integers with the number of elements equal to the number of students surveyed. The function will accept as arguments the following: An integer that indicates the number of elements in the array.

The array should be dynamically allocated.

Function: getStudentData

Allow the user to enter the number of hours each student watched Netflix into the array. The function will accept as arguments the following:

1. An array of integers
2. An integer that indicates the number of elements in the array.

Input Validation: Do not accept negative numbers for input.

Function: makeArray

Define an array of integers with the number of elements equal to the number of students surveyed. The function will accept as arguments the following: An integer that indicates the number of elements in the array.

The array should be dynamically allocated.

Function: printArray

This function should print out the text "Number of hours each student watched Netflix in ascending order: ". Then, the function should print out each element in the array with a space between each element. The function will accept as arguments the following:

3. An array of integers
4. An integer that indicates the number of elements in the array.

Function: getAverage

The average of a set of values is calculated by adding all the values and then dividing the sum by the number of values in the set. Write a function that accepts as arguments the following:

1. An array of integers
2. An integer that indicates the number of elements in the array.

The function should determine the average of the array. The average is the value the function should return.

Function: getMedian

In statistics, when a set of values is sorted in ascending or descending order, its median is the middle value. If the set contains an even number of values, the median is the mean, or average of the two middle values. Write a function that accepts as arguments the following:

1. An array of integers
2. An integer that indicates the number of elements in the array

The function should determine the median of the array. This value should be returned as a double. (The values in the array should already be sorted.)

Function: selectionSort

```
/**************************************************
 * Function selectionSort                         *
 * This function performs the selection sort      *
 * algorithm on array, sorting it into ascending  *
 * order. The parameter size holds the number of  *
 * elements in the array.                         *
 **************************************************/

void selectionSort(int *array, int size)
{
   int startScan, minIndex, minValue;

   for (startScan = 0; startScan < (size - 1); startScan++)
   {
      minIndex = startScan;
      minValue = *(array+startScan);
      for(int index = startScan + 1; index < size; index++)
      {
         if (*(array+index) < minValue)
         {
            minValue = *(array+index);
            minIndex = index;
         }
      }
      *(array+minIndex) = *(array+startScan);
      *(array+startScan) = minValue;
   }
}
```

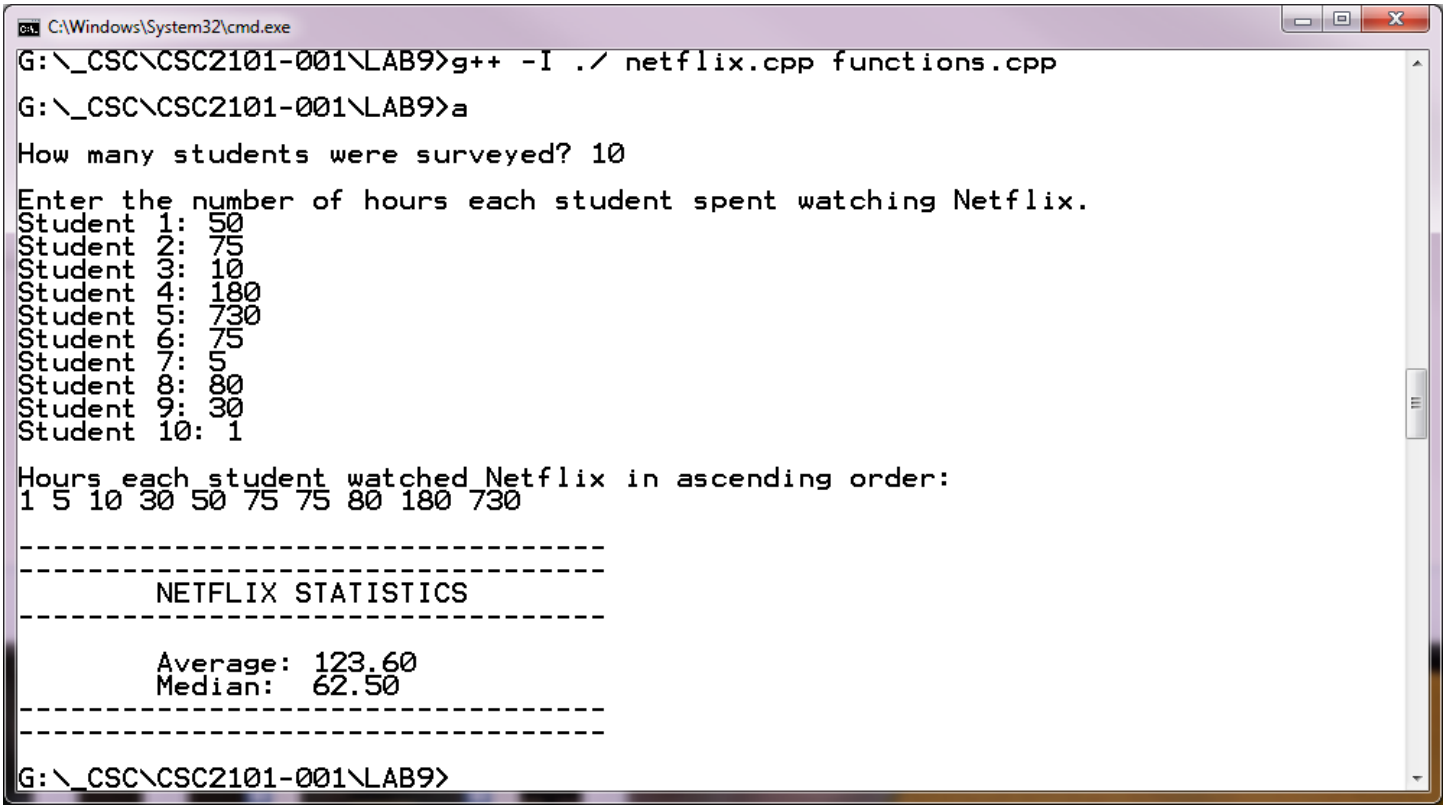
Other Rules

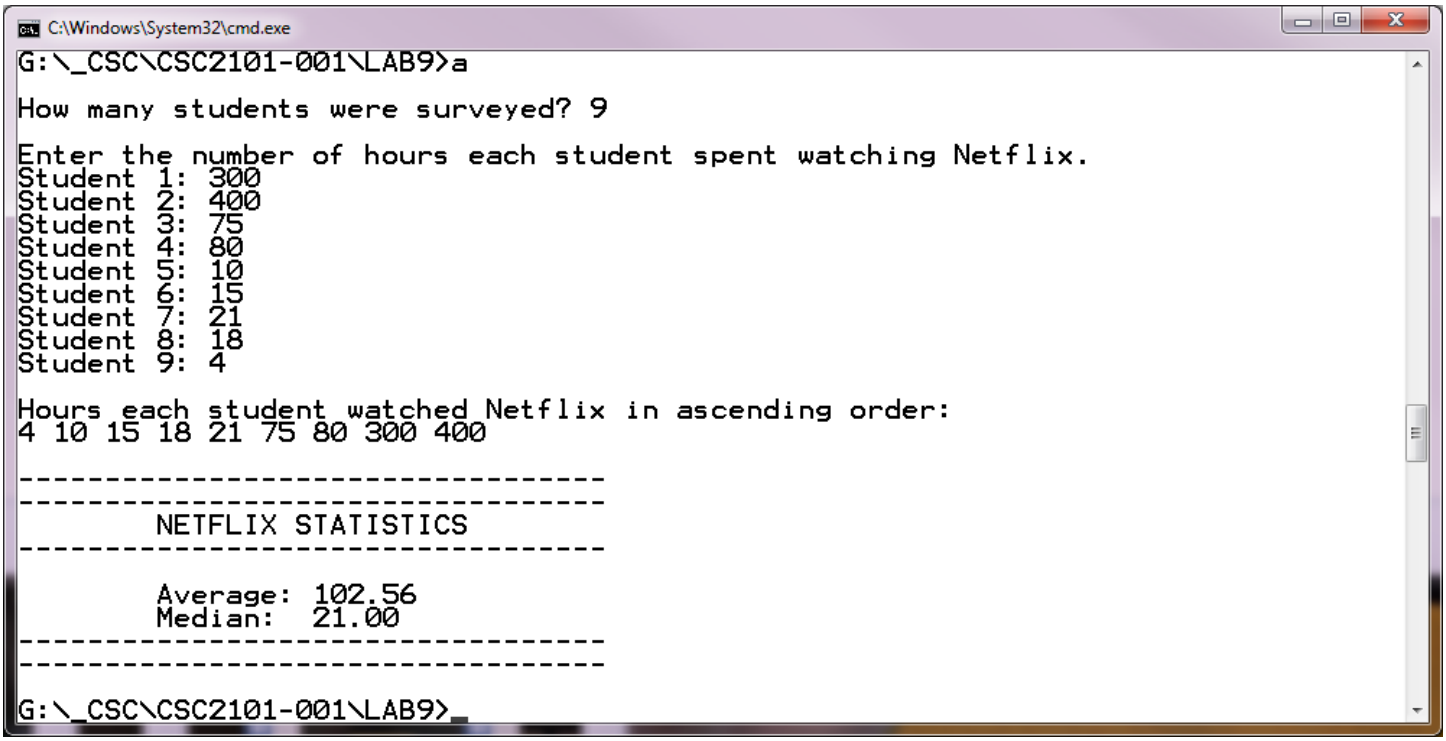
- Make sure you put a comment block at the top of ALL THREE FILES including the title, author, date & purpose.
- Each programmer-defined function should have a comment at the top of the function indicating the function purpose.
- Indent your program properly.
- Sample output is provided below. You will need to compile & run your program.

```
g++ -I ./ Netflix.cpp functions.cpp
```

- Take a screen capture of your program running….name it something like **netflixscreen**.

Sample output:





WHAT TO TURN IN

You will need to zip the following files into a folder and then upload the zipped file to the LAB 9 dropbox in ilearn by **midnight, Wednesday, March 30, 2016**. I DO NOT ACCEPT LATE LABS! Make sure your file successfully uploaded!

- netflix.h
- netflix.cpp
- functions.cpp
- netflixscreen (image or document)