**ITCS 1212L**

**PostLab 8**

**Loops and Functions**

1. **Pattern Displays (20 points)**

Write a program that uses a loop to display Pattern A below, followed by another loop that displays Pattern B.

|  |  |
| --- | --- |
| Pattern A | Pattern B |
| +  ++  +++  ++++  +++++  ++++++  +++++++  ++++++++  +++++++++  ++++++++++ | **++++++++++**  **+++++++++**  **++++++++**  **+++++++**  **++++++**  **+++++**  **++++**  **+++**  **++**  **+** |

1. **Using Files- Numeric Processing (20 points)**

If you have downloaded this book’s source code from companion Web site, you will find a file named Random.txt in the Chapter 05 folder. (The companion site is [www.pearsonhighered.com/gaddis](http://www.pearsonhighered.com/gaddis).) This file contains a long list of random numbers. Copy the file to your hard drive and then write a program that opens the file, reads all the numbers from the file, and calculates the following.

1. The total count of numbers in the file
2. The sum of all the numbers in the file (a running total)
3. The average of all the numbers in the file

The program should display A, B, and C.

1. **Random Number Guessing Game Enhancement (10 points)**

Enhance the program that you wrote for Programming Challenge 20 so it keeps a count of the number of guesses that the user makes. When the user correctly guesses the random number, the program should display the number of guesses it took for them to get it right.

1. **Star Search (25 points)**

A particular talent competition has five judges, each of whom awards a score between 0 and 10 to each performer. Fractional scores, such as 8.3, are allowed. A performer’s final score is determined by dropping the highest and lowest score received, then averaging the three remaining scores. Write a program that uses this method to calculate a contestant’s score. It should include the following functions:

* Void getJudgeData () should ask the user for a judge’s score, store it in a reference parameter variable, and validate it. This function should be called by main once for each of the five judges.
* Void calScore () should calculate and display the average of the three scores that remain after dropping the highest and lowest scores the performer received. This function should be called just once by main and should be passed the five scores.

The last two functions, described below, should be called by calScore, which uses the returned information to determine which of the scores to drop.

* int findLowest () should find and return the lowest of the five scores passed to it.
* int findHighest () should find and return the highest of the five scores passes to it.

1. **Days out (25 points)**

Write a program that calculates the average number of days a company’s employees are absent. The program should contain the following functions:

* A function called by main that asks the user for the number of employees in the company. This value should be returned as an int. (the function accepts no arguments.)
* A function called by main that accepts one argument: the number of employees in the company. The function should ask the user to enter the number of days each employee missed during the past year. The total of these days should be retuned as an int.
* A function called by main that takes two arguments: the number of employees in the company and the total number of days absent for all employees during the year. The function should return, as a double, the average number of days absent. (This function does not perform screen output and does not ask the user for input.)

*Input validation: Do not accept a number less than 1 for the number of employees. Do not accept a negative value for the days any employee missed.*