Lab exercise_2D_Arrays

1. Create a 2-dimensional array with 4 rows and 30 columns. Row represents sections of a course and column represents the students, value inside each position of the array is the Final exam grade for each students. Fill the array with random numbers between 40 and 100. Calculate the total, average, maximum, minimum for each section.

1.5. Generate a histogram for all the grades. Each score represents one dot on the histogram. To do that, first create an array of size 61 and then store the count of each scores in the array. Once you have all the count, output the number of dots for each score based on the count.

2. Create a 2-dimensional array with 10 rows and 10 columns. Fill the array with random 3 digit integers. (rand()%900 + 100). Print out the **column** with the largest sum. (If two or more columns share the largest sum, print out one of them only.) (Hint: use a 1-D array to store all the sums and find the largest sum in that 1-D array)

3. Same as question 1. Print out the **row** with the largest sum.

4. Write a complete C++ program that does the following.
   a. It asks the user to enter a positive integer value, r that is at most 100.
   b. The program reads a value entered by the user. If the value is not in the right range, the program should terminate.
   c. The program reads and stores r integers from the user and then prints a pattern of r rows of stars, the lengths of which are the other integers entered by the user.
      For example, the following represents one run of the program.
      How many rows? 4
      Enter 4 row lengths: 2 7 1 5
      **
      ****
      *
      *****

5. Write a complete C++ program that does the following.
   a. It asks the user to enter a 5-digit integer value, n.
   b. The program reads a value entered by the user. If the value is not in the right range, the program should terminate.
   c. The program calulates and stores the 5 individual digits of n.
   d. The program outputs a "bar code" made of 5 lines of stars that represent the digits of the number n.
      For example, the following represents one run of the program. (The user chooses the number 16384.)
      Enter a 5 digit integer: 16384
      *
      ******
      ***
      ****
      ****

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6. Write a complete C++ program that does the following. (Programs that correctly carry out some of the tasks will receive partial credit.)

   1. It asks the user to enter 9 integers as the entries of a 3 × 3 table.

   2. The program reads the 9 entries, row by row and prints the table.

   3. If every row and column of the table have the same sum then the program adds the message: MAGIC.

   Here is an example of how the program should work:

   Enter 9 entries of a 3 x 3 table: 10 14 18 15 16 11 17 12 13

   10 14 18

   15 16 11

   17 12 13

   MAGIC