CPSC1160 – 003 – 202130

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Midterm 1 Part 1

Total Points: 20

Total Time: 25 minutes

* Place all your code in a single CPP file
* submit your completed CPP file (one file) through appropriate link on D2L
* Please submit earlier than the end time to make sure you have an answer uploaded
  + Once submission link is closed it will be the end of this segment of the test
  + You can submit as many times as you want as long as it is before the deadline
  + Only LAST Submission will be kept

You may add/modify parameters of functions stated below. **Not writing functions as part of your solution will result in a zero regardless of the correctness of your code**.

*No global variables or static variables allowed.*

Write a function named GenerateMatrix that takes takes parameters rows and columns which represents number of rows and number of columns for each row respectively. This function generates (and returns) an array of int values where each integer is a random one between 0 and 9 (both inclusive).

So the matrix returned will be a rectangular matrix (or square but not jagged).

Write a function named Show that displays the matrix you generated. Define parameters as necessary.

Display the matrix content in such a way that it shows every row on a new line, use spaces to separate the values on each line.

In a rectangular matrix (or a square one), elements whose row and column are equal can be connected by a straight path diagonally and it is called the main diagonal of a rectangular matrix (see pic below). For example, element at positions row = 3 and column = 3 will be part of the main diagonal.

Chart, scatter chart

Description automatically generated

Write a **recursive function** named **int MainDiagonalSum(int\* matrix, int r, int c)** that returns the sum of all elements on the main diagonal of matrix with r rows and c columns.

Write a main function to test your work.