The function LinearIndx takes two integers as parameters, representing the row and column index of an element in the square matrix, and returns an integer representing the index of that element in the linear array. The formula used for this function was:

Where i and j are the given indices of the 2D array and I is the index of the linear array such that A[i][j] = B[I]

The function InverseIndx takes one integer parameter, which is the index of an element in the linear array, and returns a tuple containing the row and column index of the element in the corresponding lower triangular array. For this function, the calculations are:

Where I is the given index of the linear array and i and j are the indices of the 2D array such that B[I] = C[i][j]

A third function was created called MatrixRun, which takes one integer N as a parameter. This determines the size of the 2D matrix. A random number generator is used to fill in the lower triangular matrix A[N][N]. LinearIndx is called to generate a linear matrix B, then InverseIndx is called to generate another 2D matrix C. After each matrix is created, the first 20 elements of the matrix are printed.

The main method calls MatrixRun 3 separate times, with N = 8, N = 32, N =128