Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Array Review

* Ways to store
  + Variables in order
  + index from 0..N
* Arrays are
  + a type themselves
  + the value of the array
    - reference to memory location!
    - you need an index to access the value!
  + .length gives us total memory allocated
* Arrays can
  + be any size – as long as you allocate it
  + Store any valid type: primitives and objects
  + and store other arrays (since they are a type themselves)!

Multidimensional Arrays

* Number of brackets define number of dimensions
* Declaring the entire array at once
  + int [][] arr2D = new int[3][3];
    - 3 rows, 3 columns
    - fully initialized with zeros
* Irregular/ragged multidimensional array, each column can have a different length
  + int[][] ragged = new int[3][];
    - creates an array of 3 null values
    - requires an int[] to be placed in each spot.



1. Implement a class named DArrays that has the following methods:

*/\*\*  
 \* readMatrix  
 \* Receives a Scanner in, int row and int col  
 \* Creates a matrix of row and col dimensions  
 \* Reads values for each element of the matrix and return the matrix  
 \** ***@param*** *in  
 \** ***@param*** *row  
 \** ***@param*** *col  
 \** ***@return*** *int [][]  
 \*/*

*/\*\*  
 \* printMatrix  
 \* Print each element of the matrix using %-4d as formatting  
 \* pattern to print each element.  
 \* Tip: use System.out.printf  
 \** ***@param*** *matrix [][]  
 \*/*

*/\*\*  
 \* readMatrix2  
 \* Receives a Scanner in and an int row  
 \* Creates an irregular multidimensional array  
 \* Reads the number of columns for each row  
 \* Creates the array of columns for each row considering the  
 \* number read  
 \* Reads values for each element of the matrix and return the   
 \** ***@param*** *in  
 \** ***@param*** *row  
 \** ***@return*** *int [][]  
 \*/*

*/\*\*  
 \* main  
 \* Creates a Scanner object  
 \* Call the methods previously implemented  
 \** ***@param*** *args  
 \*/*

1. Implement the method public static int [] maxEachRow(int [][] matrix) which returns the maximum value in each row of the matrix.
2. Implement the method public static int maxMatrix(int [][] matrix) which returns the maximum value of the matrix.
3. Implement the method public static int[] principalDiagonal(int [][] matrix) which return the values in the principal/main diagonal of a square matrix.
4. Implement the method public static void swapPrincipalSecondary(int [][] matrix) which swaps the values of the principal and secondary diagonals of the matrix.



swapPrincipalSecondary