**Computer Science 2**   **Lab # 03**



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**CS2 Section # 03**

**Due:** Problem A by the **end of the lab** and Problems B by the end of **Saturday** of the same week.

**Project A: SumMajorDiagonal**

**Problem Description:**

Write a [method](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) that [sums](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) all the numbers in the major diagonal in an n x n matrix of [double](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) [values](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) using the following header:  
  
public [static](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) [double](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) sumMajorDiagonal([double](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?)[][] m)  
  
Write a test [program](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) that first prompts the user to enter the dimension n of an n x n matrix, then asks them to enter the matrix row by row (with the [elements](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?)separated by spaces). The [program](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) should then print out the [sum](https://pearson.turingscraft.com/codelab/jsp/core_dhtml.jsp?) of the major diagonal of the matrix.

**Analysis:**

(Describe the problem including input and output in your own words. Type your answer in the following with **BLUE font color**)

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| **Using a 2D array, I have to write a method that sums up the diagonal index values and print them out in a main method.** |

**Design:**

(Describe the major steps for solving the problem. Type your answer in the following with **BLUE font color**)

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| **1) create a method called sumMajorDiagonal that takes a parameter of a 2D array - double[] [] m**  **2) the method should include a for loop that goes through the array and adds the values and return that sum**  **3) the main method includes a scanner to allow for user input in order to get the dimension on the array**  **4) with a nested for loop (i and j are the combined two arrays) will fill each index of the array with an input value.**  **4) print the sum result using the method created first** |

**Coding:** (Copy and Paste Source Code here. Type your answer in the following with **BLUE font color**)

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| **import java.util.Scanner;**  **public class SumMajorDiagonal {**    **public static double sumMajorDiagonal(double[][] m) {**  **double sum = 0;**  **for (int i = 0; i < m.length; i++) {**  **sum = sum + m[i][i];**  **}**  **return sum;**  **}**  **public static void main(String[] args) {**  **Scanner in = new Scanner(System.in);**  **System.out.print("Enter dimension n of nxn matrix:");**  **int n = in .nextInt();**  **double[][] myArray = new double[n][n];**  **for (int i = 0; i < n; i++) {**  **System.out.print("Enter row " + i + ":");**  **for (int j = 0; j < n; j++) {**  **myArray[i][j] = in .nextDouble();**  **}**  **}**  **System.out.println(sumMajorDiagonal(myArray));**  **}**  **}** |

**Testing:** (Describe how you test this program. Type your answer in the following with **BLUE font color**)

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| **Tester Provided by MyProgrammingLab:**  **Enter·dimension·n·of·nxn·matrix:4↵**  **Enter·row·0:5.0·6.4·7.8·9.0↵**  **Enter·row·1:1.2·3.6·2.0·4.4↵**  **Enter·row·2:8.8·6.7·3.0·0.2↵**  **Enter·row·3:2.6·9.1·1.0·5.5↵**  **17.1↵** |