Matrix Manipulation Documentation

Matrix Manipulation contains only two classes, a main class “Matrix\_Manipulation” to receive the user’s input and handle their choices, and “Matrix”, a class to hold and perform operations on a matrix.

Matrix

Classwide variables

private double[][] matrix: an n by m matrix.

private double[] aug: an n by 1 matrix attached to the original matrix to form an augmented matrix.

Constructors

public Matrix() : Leaves an example matrix created from the start.

public Matrix(double[][] m, double[] a) : accepts an n by m matrix and an n by 1 matrix and inserts them into “matrix” and “aug” respectively.

Functions

showMatrix() : Prints the matrix to the console. Does not return any value.

getNumber(int r, int c) : returns a double corresponding to the row and column entered.

rowEchelonForm() : Performs row operations on the matrix until it is in row echelon form (i.e. there are 0s under all the pivots), printing the matrix along with the operations performed each step. Does not return any value.

formatMatrix() : formats the matrix such that they are arranged by amount of zeroes in the rows, with the top having the least amount of zeroes. Does not return any value.

reducedREF() : Performs row operations on the matrix until it is in reduced row echelon form (i.e. there are 0s above and under all the pivots, and all the pivots are 1), printing the matrix along with the operations performed each step. Does not return any value.

multRow(int row, int amount) : multiplies the given row by the given scalar value. Does not return any value.

swapRows(int firstRow, int secondRow) : Swaps the two given rows. Does not return any value.

addRow(int startRow, int destinationRow, double times) : adds startRow to destinationRow “times” times.

Matrix\_Manipulation

Matrix\_Manipulation contains only the main method to ask the user for their matrix and the operations they would like to perform on it.