# CSE218

## Home Assignment 2

### Topic: Gaussian Elimination

In this assignment, you will implement the Gaussian Elimination method for solving a system of linear equations. A system of linear equations is often represented in matrix form as $AX = B$ where $A$ is the coefficient matrix, $X$ is the variable matrix (a column vector), and $B$ is the right-hand side constant matrix (also a column vector).

You should write a python function *GaussianElimination(A,B,d)* to implement the task. The function returns the solution as a column vector. The input $d$ is a flag variable. Your program should have provision to show the intermediate matrices (both $A$ and $B$) after every sub-steps of the forward elimination if $d$ flag is set to true. By default, $d$ should be true. A sub-step of forward elimination is a single row operation done to set the leftmost element of the row to zero (0).

**Sample input/output:**

The first integer in the sample input denotes the number of unknown variables in the system. This is also the number of linear equations given. Next inputs will be matrices $A$ and $B$ in row major order (as shown in the input below).

Your program should output the solution vector and intermediate matrices (if $d$ flag is set programmatically). The elements of the solution vector should be printed up to four (4) decimal places.

| Sample input | Sample output |
|---|---|
| 3 | 0.2905 |
| 25  5  1 | 19.6905 |
| 64  8  1 | 1.0857 |
| 144  12  1 | |
| | |
| 106.8 | |
| 177.2 | |
| 279.2 | |