ME685 HW2

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$$Ax = b$$

The task is to solve for x using **Gaussian Elimination**, where A and b are known non-singular matrix and vector respectively.

The code is attached with the submission.

For the matrix given:

$$A = \begin{bmatrix} 4 & 1 & 1 & 1 \\ 1 & 4 & 1 & 1 \\ 1 & 1 & 4 & 1 \\ 1 & 1 & 1 & 4 \end{bmatrix}; b = \begin{bmatrix} 7 \\ 7 \\ 7 \\ 7 \end{bmatrix}$$

After solving, we get x as:

$$x = \begin{bmatrix} 1 \\ 1 \\ 1 \\ 0.99 \end{bmatrix}$$

A snapshot of the Result of the code:

```
aman@xps ~/ME685 ./a.out
A Matrix:
  4.00000000       1.00000000       1.00000000       1.00000000
  1.00000000       4.00000000       1.00000000       1.00000000
  1.00000000       1.00000000       4.00000000       1.00000000
  1.00000000       1.00000000       1.00000000       4.00000000
B Matrix:
  7.00000000
  7.00000000
  7.00000000
  7.00000000
Modified A Matrix:
  4.00000000       1.00000000       1.00000000       1.00000000
  0.00000000       3.75000000      0.750000000      0.750000000
  0.00000000       0.00000000       3.59999990      0.600000024
  0.00000000       0.00000000       0.00000000       3.50000000
Modified B Matrix:
  7.00000000
  5.25000000
  4.19999981
  3.49999976
X (Solution) Matrix:
  1.00000000
  1.00000000
  1.00000000
 0.999999940
```