ASSIGNMENT 6

Covers Matrix Operations of Unit 4

1. Use Gaussian elimination and solve the following problem:

   (a) $2x_1 + 3x_2 + x_3 = 12$

   $x_1 + x_2 + 3x_3 = 10$

   $2x_1 + x_2 + x_3 = 8$

   (b) $2x_1 + 3x_2 + x_3 = 6$

   $x_1 + 6x_2 + 7x_3 = 14$

   $3x_1 + x_2 + 2x_3 = 5$

2. Perform LU decomposition of the matrices obtained from Exercise 1 using the Gaussian elimination method.

3. Find the matrix inverse for the following matrix using the Gaussian elimination method:

   (a) $\begin{pmatrix} 2 & 4 \\ 3 & 1 \end{pmatrix}$

   (b) $\begin{matrix} 2 & 3 & 1 \\ 1 & 3 & 4 \\ 5 & 6 & 2 \end{matrix}$

4. Find the determinant of the following matrices using Crout's LU decomposition:

   (a) $\begin{pmatrix} 3 & 2 \\ 4 & 6 \end{pmatrix}$

   (b) $\begin{matrix} 4 & 6 & 2 \\ 7 & 8 & 2 \\ 1 & 1 & 4 \end{matrix}$