EML3041 Computational Methods

Fall 2023

Week Seven: September 25 – September 29

Session 01 Questions

Answer the free-response questions starting on a fresh sheet of paper. Solve the problem as if you were submitting them for a test. Identify each part separately.

Given the LU decomposition of a 3×3 matrix [A] is

$$[A] = \begin{bmatrix} 1 & 4 & 6 \\ 4 & 21 & 32 \\ 5 & 30 & 59 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 4 & 1 & 0 \\ 5 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 & 4 & 6 \\ 0 & 5 & 8 \\ 0 & 0 & 13 \end{bmatrix}$$

a) What is definition of the inverse of a matrix?

b) Write the [A][X] = [C] form to find the second column of the inverse of [A]

c) Find the second column of the inverse of [A] using the LU decomposition method of solving simultaneous linear equations.

Answer:

a) Not given intentionally

b) Not given intentionally

c)
$$\begin{bmatrix} -0.8615\\ 0.4462\\ -0.1538 \end{bmatrix}$$