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Assignment # 8

A linear system is described by the following equations

$$
\begin{aligned}
4x_1 - x_2 + x3 &= 8 \\
2x_1 + 5x_2 + 2x_3 &= 3 \\
x_1 + 2x_2 + 4x_3 &= 11
\end{aligned}
$$

Answer the following questions (1-5):

Questions-1: [2 Mark] Does this system has any unique solution? Explain or show calculation.

Question-2: [6 Marks] Solve the above linear system by Gaussian elimination method.

Now solve the same linear system above by the LU-decomposition method:

Question-3: [4 Marks] Construct the matrices $F^{(1)}$ and $F^{(2)}$.

Question-4: [4 Marks] Find the lower triangular matrix L.

Question-5: [4 Marks] Now find the solution of the linear system again using the matrix L found in the previous question. Is your solution agree with answer found in Question-2?

<u>Submission of the Assignment # 8:</u>

- Solve all problems above.

- Prepare a title page including

Your Name, Your ID#, Theory Section #.

- Prepare a single .pdf or .jpg file containing the title page and the solution pages.

- To submit your assignment solution, visit the Submission Link (**Click here**). This will take you to a Google Form link.

- Fill up the Google Form link with correct information and upload the file there. You are done.

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