University of Regina

Software Systems Engineering

Winter term, 2018 ENSE-350

[Put your code, graphs (if any) and the required explanation in ONE file and upload it to URCourses.

Develop your own program to determine the LU factorization of a square matrix. That is, develop a function that takes a square matrix (of arbitrary dimensions) and returns the triangular matrices [L] and [U]. Confirm that your function is working properly by verifying that [L][U] = [A].

Test your function by using it to solve the following system of linear equations:

$$3x_1 - 2x_2 + x_3 = -10$$
$$2x_1 + 6x_2 - 4x_3 = 44$$
$$-8x_1 - 2x_2 + 5x_3 = -26$$

Acknowledgement: This question is taken from “Applied Numerical Methods W/MATLAB: for Engineers & Scientists, 3rd Edition by Chapra, Steven”