LAURENTIAN UNIVERSITY

CPSC 5006 EL

Matrix Computations

Assignment 2

Due Friday, February 16th, 2024

Question 1 Exercise 1.4.73, (a) and (b) page 54 USE MATLAB (Fundamentals of Matrix Computations, Third Edition)

1. inner product (page 38)
2. outer-product (page 42)

Question 2 Exercise 1.4.74, page 54 USE MATLAB (Fundamentals of Matrix Computations, Third Edition)

Question 3 Exercise 1.5.6, page 58 (Fundamentals of Matrix Computations, Third Edition)

Question 4 Exercise 1.5.9, page 59 (Fundamentals of Matrix Computations, Third Edition)

Question 5 Exercise 1.6.5, page 69. please read page 65 and Example 1.6.2 (Fundamentals of Matrix Computations, Third Edition)

Question 6 Exercise 1.7.10, page 77 and Exercise 1.7.18, page 81 (Fundamentals of Matrix Computations, Third Edition)

Question 7 Exercise 1.7.34, page 87 (Fundamentals of Matrix Computations, Third Edition)

Question 8 Exercise 1.8.12 and Exercise 1.8.15 page 104, USE MATLAB (Fundamentals of Matrix Computations, Third Edition)

Question 9 The total cost of solving $Ax = b$ by Gaussian elimination without pivoting where A is an $n \times n$ matrix is about $\frac{2}{3}n^3$ flops. Explain why the cost is $\approx \frac{2}{3}n^3$, based on the developments in pages 73-76. Count the additional costs associated with row and column interchanges in the total-pivoting strategy.

Question 10 Exercise 2.2.28, page 132 and Exercise 2.6.6, page 153 (Fundamentals of Matrix Computations, Third Edition)