Homework #3

- Textbook:
  - Due: 1.5.4, 1.5.9, 1.5.11, 1.5.12, 8.1.12
  - Not due: 8.2.7, 8.2.18, 8.2.27, 8.2.28.

- Programming:

  1. Write a function in Matlab that takes as input the number \( n \) and a symmetric tridiagonal matrix given as two vectors: \( n \times 1 \) vector \( v \) representing the main diagonal and \( (n - 1) \times 1 \) vector \( w \) representing the upper diagonal. Have this function output the Cholesky factor of the matrix as a vector for the main diagonal and a vector for the upper diagonal and output the number of flops and, separately, the number of square roots used as well. Use only basic programming.

    (a) Write out or print out your function.
    (b) Run the case with \( v = 2 \times \text{ones}(10,1), w = -\text{ones}(9,1) \) and write out or print out all your results.
    (c) Run the case with \( v = 2 \times \text{ones}(100,1), w = -\text{ones}(99,1) \) and write out or print out your results just for the number of flops and square roots used. How many times more flops are used than in the previous case?