Homework #3

• Textbook: 1.4.52, 1.4.54, 1.4.56, 1.4.60, 1.4.68, 1.5.4, 1.5.9, 1.5.11.

• Programming:

1. Let $A$ be a symmetric, positive definite, tridiagonal matrix. We store $A$ as two vectors: an $n \times 1$ vector $v$ representing the main diagonal and an $(n - 1) \times 1$ vector $w$ representing the upper diagonal. Using basic programming (for loops, while loops, and if statements):

(a) Write a function that inputs
   - dimension $n$;
   - column vectors $v$, $w$;
   then uses the inner product formulation of Cholesky’s method to find the Cholesky factor, and then outputs the number of flops used. Print out or write out this function and turn it in.

(b) Run your program for $n = 10, 100, 400$, and $v$ the vector of all 2’s and $w$ the vector of all $-1$’s. Print out or write out your results and turn them in.