Homework #1

- Textbook: 1.2.4, 1.2.16, 1.2.17, 1.2.18, 1.2.19, 1.2.20, 1.3.4, 1.3.17
  (For these problems, excluding 1.3.4 and 1.3.17, if you are asked to solve a linear system, you can do it any way, including using Matlab)

- Programming:

  1. Using basic programming (for loops, while loops, and if statements), write two functions in Matlab, both taking as input:

     - dimension n;
     - $n \times n$ matrix A;
     - $n \times n$ matrix B;
     - $n \times 1$ vector x.

     Have the first function compute ABx through $(AB)x$ and the second compute ABx through $A(Bx)$. Have both output:

     - the number of flops used.

     (a) Print out or write out the first function.

     (b) Print out or write out the second function.

     (c) Apply both your functions to the case with random matrices and vectors for $n = 100$ and print out or write out the results. Do the same for 200×200, 400×400, and 800×800. Which approach of computing ABx is faster?