Introduction to MATLAB

Thursday, October 20th, 2016

Exercises for individual work (1)

1. Plot the following expressions:
   a. sin(2x) + cos(x), 0<= x<=2PI;
   b. $x^4 + 3x^3 - 4x^2 - x + 1$, -1<=x<=2.

2. Write in an *m*-file a program for the scalar product *c* of two vectors *a*,*b* of the same size. Use *for* loops. Compare the performance of your implementation with the one available in MATLAB.

3. Write a MATLAB program for computing the matrix-vector product. Use *for* loops. Compare the performance of your implementation with the one available in MATLAB.

4. Implement the bisection algorithm for approximating the zero values of the following expression:
   y=x.*x - 3*x + 1/3, for 0<=x<=1.

5. Using the bisection algorithm, write a function that computes approximations of all real solutions of a given function *f*, in a given interval *I*.
   a. sin(2x) + cos(x) = 0;
   b. $x^4 + 3x^3 - 4x^2 - x + 1 = 0$.

6. Write a MATLAB program to calculate the value of a polynomial using the Horner scheme.

Note:
For solving the exercises, you are encouraged to use your notes, the tutorial materials, and especially the MATLAB help. Some of the keywords useful for the exercises are: variable, expression, sequence, vector, plot, for, if.