Summer 2014 MATLAB Assignment 3

Work the following problems (NOTE: these are RELATED TO the corresponding page and problem number from Gilat. Do NOT work the actual problems from the Lab Manual, or you will receive NO CREDIT!)

1. **g210x07**: (For loops: see pp190-195 and nested loops: see pp198-199)
   Use loops to create a 3×5 matrix in which the value of each element is the difference between the indices divided by the sum of its indices (the row number and column number of the element). For example, the value of the element (2, 5) is $(2-5)/(2+5) = -0.4286$.

2. **g211x11** (if-elseif statements: see pp185-187):
   Write the program indicated in the problem and use it to solve the following equations:

   (a) $10x^2 - 29x + 10 = 0$

   (b) $5x^2 - 6x + 2 = 0$

   (c) $9x^2 - 30x + 25 = 0$

3. **g211x12** (for loops: pp190-195; if-else statements: pp184-187; break: p200):
   Write a program in a script file that finds the smallest even integer that is also divisible by 7 and whose cube is greater than 40,000. Use a loop in the program. The loop should start from 1 and stop when the number is found. Use the **disp** command to print the message: "The required number is:" and then print the number (see p 101).

4. **g215x26** (while loop: pp195-196):
   An algorithm similar to the one described in this problem can be used to find the cube root of a number ($\sqrt[3]{P}$): Let $x_1 = P$, and, for each x_i, the subsequent value can be obtained by letting $x_{i+1} = \dfrac{2x_i^3 + P}{3x_i^2}$. Write a Matlab program that calculates the cube root of a number using this method. Let $x_1 = P$, calculate x_2, then use a while loop to create subsequent values of x_i. Run the loop as long as (i.e., **while**) the error E between the two previous guesses (defined by $E = |x_i - x_{i-1}|$ is larger than 0.00001. Use the program to calculate the following:

   (a) $\sqrt[3]{100}$

   (b) $\sqrt[3]{9261}$

   (c) $\sqrt[3]{-70}$