Homework 2
Due: 2/1/2018

- Assignments are due at the beginning of class on the due date.
- Any Matlab files are to be submitted as .m files via Moodle (with a corresponding run/driver file if necessary).
- Each file must be uploaded individually. Zipped files will not be graded.
- Show all work and provide discussion where needed in order to receive full credit.

1. Write out the first five terms of the sequence satisfying the following difference equation.

$$\Delta t_n = 1.5(100 - t_n),\ t_0 = 200$$

2. You owe \$500 on a credit card that charges 1.5% interest each month. You pay \$50 each month and you make no new charges.
   a. Formulate a dynamical system that models change exactly for the described situation.
   b. Plot and analyze the data. After how many month will the card be paid off?

3. Cipro is an antibiotic taken to combat many infections. Cipro is filtered from the blood by the kidneys. Each 24-hour period, the kidneys filter out about one third of the Cipro that was in the blood at the beginning of the 24 hour period.
   a. Assume a patient was given only a single 500-mg dose. Use a difference equation to construct a table of values listing the concentration of Cipro in this patient's blood at the end of each day, for thirty days.
   b. Assume that the patient must take an additional 500 mg per day. Use a difference equation to construct a table of values listing the concentration of Cipro in this patient's blood at the end of each day, for thirty days.
   c. Compare and interpret the two tables.