Math 301 - Project 2
Due March 30, 2005

Directions: Create a diary of your commands and output in matlab to answer the following questions. In a word processor, answer the following questions, including the code and output from your diary following each answer. Edit any errors and clearly mark each problem. Turn in your word processed document in class on the due date.

1. Do problem #1 (population dynamics) of the matlab exercises on pages 108-109 of the textbook, labeling each problem #1a - #1g.

2. Every day a manager rates the performance of each member of her staff as poor, average or excellent. If a worker was rated poor on one day then the probability that on the next day he will be rated poor is 0.2, average is 0.7 and excellent is 0.1. If a worker was rated average on one day then the probability that on the next day he will be rated poor is 0.3, average is 0.4 and excellent is 0.3. If a worker was rated excellent on one day then the probability that on the next day he will be rated poor is 0.1 and average is 0.7.

(a) Complete the construction of a transition matrix below for the above information. Recall that probabilities should add up to 1, that is that on any given day, the probabilities of being rated poor, average and excellent should add up to 1.

For each of the following, suppose that initially 10% of the workers were rated excellent, 75% average and 15% poor. State all of the following answers to the nearest 6th decimal place by using `format long`.

(b) What percentage was rated excellent the next day?
(c) What percentage was rated excellent after a 5-day work week?
(d) What percentage was rated excellent after 30 days?
(e) What percentage was rated excellent after 365 days?
(f) What percentage will be rated excellent in the long run?

3. Do problem 2 parts b,c,d,e and f again, except this time suppose that initially 80% of the workers were rated excellent, 15% average and 5% poor.

4. Do problem 2 parts b,c,d,e and f yet again, except this time make up whatever new percentages you want for the initial ratings (of course, your percentages should be positive and add up to 100%).

5. What interesting things do you notice about your answers to problems 2, 3 and 4?