

## Homework 2

Do the problems on webwork and turn the following problems in class on Feb. 7th.

Homework should be written neatly and clearly explained. If it requires more than one sheet, the sheets must be stapled. Include your name and id number in the top right corner of your homework.

**Problem 1.** In a given city it is always either Sunny or Rainy. The probability it rains on the day after a Rainy day is .6. The probability it rains on the day after a Sunny day is .7.

If today is Sunny, what is the probability tomorrow will be Rainy, followed by 3 Sunny days, followed by a Rainy day?

**Problem 2.** A friend of yours plays a game against an opponent. The game goes as follows: your friend draws two cards from a well shuffled deck of 12 cards marked with numbers 1 to 12 and their opponent then draws two cards from the rest of the deck. Your friend wins if both their cards are larger than both of the opponent's. After dealing the cards, your friend has the option to withdraw from the game. Your friend asks if it is more likely they lose (in which case they will want to withdraw) or win (in which case they will not withdraw).

1. Compute the conditional probability your friend wins if their lower card is  $k$ . (Your answer should be a function of  $k$ .)
2. If their lower card is  $k$ , for which values of  $k$  should they withdraw?