

## Applied Statistics HW 11

1. We are playing against Anderson for the title, in a 'best out of 3' system. In first game, the chances are even for the two teams to win. For each successive game, the chances depend on what happened in the previous game. If we have won the previous game, then our spirits are lifted and we have a 60% chance to win. If we have lost the previous game, then we feel down and our chances to win are only 40%.

- a. Draw a decision tree outlining the various possibilities.

- b. What are the chances, that a third game will be necessary?

- c. Supposing instead (just for this part), that our chances of winning any game are 50%. What are the chances that a third game will be necessary then? How does this answer compare to your answer to the previous part, and how does that make sense?
- d. What are our chances of winning the second game (assuming we know nothing about what happened on the first game)?
- e. Recall what it means for two events to be independent. Are the events 'We win the first game' and 'We win the second game' independent?

2. A coin is flipped 4 times. On each coin flip, the chances of getting heads are 30%.

a. What are the chances, that we will get 0 heads?

b. What are the chances, that we will get 1 heads? 2 heads?

c. What are the chances, that we will get 3 heads? 4 heads?

d. Suppose we know we ended up with at least 1 heads. What are the chances, that we had exactly 1 heads?