

# Introductory Statistics-I

Fall 2007, TTH: 6:10-7:30 PM  
Murray Hall Room 210

## Homework Problems

### Chapter 1:

Section 1: 1,4,7,10,12,14,25,26.

Section 2: 31,32,34,37,41,47.

Section 3: 49,51,55.

Section 4: 58,59,61,62,66.

### Chapter 2:

Section 1: 7,8,13,14.

Section 2: 17,24,25,28,31,42.

Section 3: 49,51,53,58,63,69.

Section 4: 89,92.

### Chapter 3:

Section 1: 1,4,5,10,12,19,23,31.

Section 2: 46,48,50,52,54,56,63,77,78.

Section 3: 85,93,97,99,102,106

Section 4: 118,122,124,128,129,130.

### Chapter 4:

Section 1: 4,7,8,10,19.

Section 2: 30,31,32,37,38,40.

Section 3: 55,58,61,65,68,69.

section 5: 90,91,92,93,94,98.

section 6: 107,108,109,111,113,118,120

section 7: 139,140

### Chapter 5:

section 1: 1,3,4,9,11,15,16,17

section 2: 21,24,29

section 3: 39,41,42,43,44,49,51,54

Problems on Coin tossing, conditional probability, Bayes's rule:

1) Given a fair coin,

a) what is the probability that you observe 10 consecutive heads?

b) What is the probability that you observe 5 H's and 5 T's in the first 10 tosses.

Ans:  $1/1024$  and  $252/1024$

2) Suppose you draw two cards from a standard deck of 52 cards without replacement. Given that the first card is an ace, what is the probability that the second card is a queen?

Ans:  $4/51$

3) Archery problem - Rachel, Susan and Tiffany are shooting at a target in archery. With each arrow, the probability of hitting the center is:

Rachel  $\frac{1}{3}$ , Susan  $\frac{1}{4}$  and Tiffany  $\frac{1}{5}$

What is the probability that:

Rachel hits the center given that exactly two girls hit the center? Ans:  $7/9$

exactly two girls hit the center given that Rachel hits the center? Ans:  $7/20$

Susan hits the center given that at least two girls hit the center? Ans:  $7/10$

at least two girls hit the center given that Susan hits the center? Ans:  $7/15$

4) A box contains 1000 coins of which 999 are fair coins and the other coin is an odd one which has both sides Heads. Suppose you picked a coin from the box at random and observed the result of 10 consecutive tosses to be 10 Heads. What is the probability that the chosen coin has both sides Heads? Ans: 0.506 (Hint: use Bayes formula.)

5) In the above problem, suppose you observed 20 consecutive Heads instead of 10. What is now the probability that you picked the odd coin? Ans: 0.999.

## **Chapter 6:**

Section 1: 2,3,4,5,12,17.

Section 2: 37,38,39,41,43,45,46,47,51,52,53,54,58.

Section 3: 66,67,69,77.

## **Chapter 7:**

Section 1: 2,3.

section 2: 18,20,21,22,30,31,33.

Section 3: 47,48,49,50,55,59.

## **Chapter 8:**

Section 1: 1,3,5,7

Refer to procedure 8.1 (page 367) for the following problems.

Section 2: 13,14,18,23,25,27,31,36

Section 3: 50,51,53,57,62,63,66

Refer to procedure 8.2 (page 385) before solving the following problems.

Section 4: 71,72,73,74,75,79,80,81,82,85,87,91,93.

## **Chapter 9:**

Section 1: 2,3,4,5,6,7,9

Section 2: 20,22,23,25,27,33

Section 3: 53,55,57,58,59,61,63