

# STA 250: STATISTICS

## HW 1

Due Wed Sep 04 2013

This homework is intended to be a review of the materials you are expected to be familiar with. You may consult chapters 1-5 of DeGroot and Schervish for a brush up.

1. The table below classifies 231 university students according to their hair and eye colors.

		Eye color				Total
		Blue	Green	Brown	Black	
Hair color	Blonde	20	15	18	14	67
	Red	11	4	24	2	41
	Brown	9	11	36	18	74
	Black	8	17	20	4	49
Total		48	47	98	38	231

If a student was randomly selected from this group, what is the probability that the student would have

- (a) black hair?
  - (b) brown eyes and black hair?
  - (c) brown eyes given s/he has black hair?
  - (d) black hair given s/he has brown eyes?
2. Suppose a researchers thinks that a 10% of all human beings are left-handed. What's the probability that in a randomly chosen sample of 10 students she'd have at least one left hander? What's the probability that in a randomly chosen sample of 500 students she's have at least 50 left handers?
  3. Let  $U \sim \text{Uniform}(0, 1)$ . Find the pdf of the random variable  $X = \log \frac{U}{1-U}$ .
  4. Let  $X$  have the exponential distribution with mean 1. Find  $EY$  where  $Y = \min(X, 1)$ .
  5. Suppose  $U_1, U_2, \dots, U_{100}$  are independent  $\text{Uniform}(0, 1)$  random variables. Find the probability that  $U_1 + U_2 + \dots + U_{100} > 55$ .