

Economics 520, Homework 2

Due Tuesday, Sept 13 at beginning of class

1. Suppose a breathalyzer has 5% false positives and 8% false negatives. That is, only 5% of the time will it indicate that a person is drunk when he is actually sober and 8% of the time will it indicate that a person is sober when the person is in fact drunk. Using this test, the police spot test a population of drivers, 99% of whom are sober. What is the chance that a person, who tests as drunk, is actually sober?
2. Bowl I contains 3 red chips and 7 blue chips. Bowl II contains 6 red chips and 4 blue chips. A bowl is selected at random and then 1 chip is drawn from this bowl. What is the probability that the chip drawn is red? Given that this chip is red, what is the conditional probability that it came from bowl II?
3. Bowl I contains 6 red chips and 4 blue chips. Fives of these 10 chips are selected at random and without replacement and put in bowl II, which was originally empty. One chip is then drawn at random from bowl II. Find the conditional probability that 2 red chips and 3 blue chips were transferred from bowl I to bowl II given that a blue chip is drawn from bowl II.
4. Let F be the cumulative distribution function of a random variable X . Find the cumulative distribution function of $Y = \alpha X + \beta$, where $\alpha > 0$ and β are constants.
5. CB 1.52
6. CB 1.54
7. CB 1.55
8. CB 2.1