

Probability Distributions Homework Problems

1. A federal agency is studying food stamp fraud. Based on past information, the agency statistician has determined that approximately 8% of food stamps spent in a particular geographic area are spent fraudulently. Given that, what is the probability that, of the next twenty food stamp purchases made at a grocery store in this area, none will be used fraudulently? What is the probability that no more than 4 will be used fraudulently?
2. A student takes a multiple choice examination and guesses on each question. What is the likelihood that s/he will pass the examination, given that a passing grade is 70%?
3. The probability that a patient dies after a heart operation in a particular hospital is .1. What is the probability that exactly two of the next eight patients will not recover? How likely is it that at most one patient will not recover? Use EXCEL to calculate this frequency distribution. Calculate the mean, median, and mode for the distribution. Is it symmetric or skewed? If skewed, which way?
4. You and one other person are participating in an auction to purchase a tract of land. You believe that the other bidder will bid somewhere between \$10,000 and \$15,000, but really can't estimate the value of the land to her otherwise. The auctioneer has announced that the highest bid over \$10,000 will be accepted. Is the selling price a discrete or continuous random variable? What is the likelihood that your bid will be accepted, if you bid \$12,000? How about \$14,000. If you want to be 90% certain of getting the property, how much should you bid?
5. A random variable is known to be discretely uniformly distributed between 10 and 14. Calculate the population mean and standard deviation. Sampling without replacement, generate all possible 3-element samples from this population. Calculate the sample means and verify the relationship between the statistics for the sampling distribution and the parameters of the population.