

Stat 121 (Mathematical Statistics I)

Problem Set No. 1

2025-08-19

INSTRUCTION: Present neat and detailed solutions.

1. A retailer sells only two styles of stereo consoles, and experience shows that these are in equal demand. Four customers in succession come into the store to order stereos. The retailer is interested in their preferences.
 - a. List the possibilities for preference arrangements among the four customers (that is, list the sample space).
 - b. Assign probabilities to the sample points.
 - c. Let A denote the event that all four customers prefer the same style. Find $P(A)$.
2. The probability that a customer at a bank will cash a check is 0.72, the probability that he will ask to have access to his safety deposit box is 0.09, and the probability that he will do both is 0.003. What is the probability that a customer at this bank will
 - a. either cash a check or ask to have access to his safety deposit box?
 - b. do neither?
 - c. encash a check only?
3. The probability that the market goes up on Monday is 0.6; given that it went up on Monday, the probability that it goes up on Tuesday is 0.3; and finally, given that it went up on Monday and Tuesday, the probability that it goes up on Wednesday is 0.4. Find the probability that
 - a. the market goes up on all three days.
 - b. the market goes up on Monday and Tuesday but not on Wednesday.
4. An insurance company looks at its auto insurance customers and finds that (a) all insure at least one car, (b) 85% insure more than one car, (c) 23% insure a sports car, and (d) 17% insure more than one car, including a sports car. Find the probability that a customer selected at random insures exactly one car and it is not a sports car.