

Homework Assignment 1

Due by 5 pm via Canvas, Jan 26th

SDS 321 Intro to Probability and Statistics

- Let A , B and C be three events. Find expressions for:
 - (1 pts) Both A and C , but not B occur.
 - (1 pts) None of the three events occur.
 - (1 pts) At least one of the three events occur.
 - (2 pts) At least two of the three events occur.
 - (2 pts) Exactly one of the three events occur.
- In a student community, 30% of the students own a car and 50% of the students who own a car also own a bicycle. Also, 60% of the student community own a bicycle. Furthermore 25% of students who own a bicycle, also own a two-wheeler. Car owners do not own two-wheelers. Finally, 30% of the students own a two-wheeler.
 - (2 pts) What is the probability that a randomly selected student owns a car and a bicycle?
 - (2 pts) What is the probability that a randomly selected student owns a bicycle, but does not own a car?
 - (2 pts) What is the probability that a randomly selected student does not own any of the three?
 - (2 pts) What is the probability that a randomly selected student owns a bicycle, but no car or two-wheeler?
- (5 pts) The admissions committee codes the applications for graduate school according to their publication record and GPA. The coding for publications is (a) for more than 3 papers, (b) for 1-3 publications and (c) for no publications. The coding for GPA is (1) for $GPA \geq 4.0$, (2) for $3.5 \leq GPA < 4$ and (3) for any other GPA. Consider an experiment of the coding of such an incoming application. For example if an applicant has more than 3 papers and GPA 3.7, then he/she will be coded as $a2$.
 - (1 pt) Give the sample space of this experiment.
 - (1 pt) Let A be the event that the applicant has less than 3.0 GPA. What would be the outcomes in A ?
 - (2 pts) Let B be the event that the applicant has at least one publication. Specify the outcomes in B .
 - (1 pt) Give the outcomes in $B \cap A^c$.