

Probability Assignment 1

Task Requirements Document



Task Requirements

Introduction to probability:

1. An engineering firm is hired to determine if certain waterways in Virginia are safe for fishing. Samples are taken from three rivers.

- (a) List the elements of a sample space S , using the letters F for safe to fish and N for not safe to fish
- (b) List the elements of S corresponding to event E that at least two of the rivers are safe for fishing.
- (c) Define an event that has as its elements the points $\{FFF, NFF, FFN, NFN\}$.





Task Requirements

Calculating probabilities:

1. A history exam features 5 questions. 3 of the questions are multiple-choice with four options each. The other two questions are true or false. If Caroline selects one answer for every question, how many ways can she answer the exam?

2. (a) How many five-digit numbers can be formed using the digits [5, 6, 7, 8, 9, 0, 3] if no digits can be repeated?
(b) How many of these are odd numbers?
(c) How many are greater than 1500?

3. Find the number of ways that 12 teachers can be assigned to 6 sections of an introductory psychology course if no teacher is assigned to more than one section.



Task Requirements

Conditional Probability & Bayes'

1. A random sample of 200 adults are classified below by sex and their level of education attained.

Education	Male	Female
Elementary	30	44
Secondary	26	20
College	29	51

from this group, find the probability that:

- (a) the person is a male, given that the person has a secondary education.
- (b) the person does not have a college degree, given that the person is a female.



Task Requirements

Conditional Probability & Bayes':

2. The probability that a vehicle entering the Luray Caverns has Canadian license plates is 0.12; the probability that it is a camper is 0.28; and the probability that it is a camper with Canadian license plates is 0.09. What is the probability that:

- (a) a camper entering the Luray Caverns has Canadian license plates?
- (b) a vehicle with Canadian license plates entering the Luray Caverns is a camper?
- (c) a vehicle entering the Luray Caverns does not have Canadian plates or is not a camper?

3. Assume two coins, fair and the other unfair. You pick one at random and flip it 5 times, and observe that it comes up as tail all five times. What is the probability that you are flipping the unfair coin?



Task Requirements

Conditional Probability & Bayes':

4. A shipment of 14 television sets contains 5 defective sets. In how many ways can a hotel purchase 6 of these sets and receive at least 3 of the defective sets?



Evaluation Criteria

- 80% overall solution structure.
- 5% Screenshots of all steps.
- 15% Apply methods of **Probability Theory Notations**.



Deadline

27/10/2024 at 11:59 pm



Notes

- Submit your unique solution.
- Have fun and enjoy 😊.

