

Tutorial 3

Qn 1

- a) Find the probability of a plane crash.
- b) If a plane crash occurs, find the probability of survival.
- c) Hence find the probability of dying in a plane crash.

Qn 2

Two fair dice are thrown. Let E be the event that the sum is 8. Let F be the event that the first throw is 2. Show that the two events are not independent.

Qn 3

A pair of dice are rolled. Assume that the dice is fair. Calculate

- a) the expected value
 - b) the standard deviation
- of the sum of the two dice.

Qn 4

In a course, there are 44 male and 8 female students. Suppose they are ranked according to their scores in Quiz 1.

Assume that no two scores are the same and all rankings are equally likely.

Let X denote the highest ranking achieved by a female student. Find $P\{X = 3\}$.

Qn 5

The time in years for a personal computer to function before breaking down is a continuous random variable with probability density function

$$f(x) = \begin{cases} \lambda e^{-x/9} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

in which λ is a constant.

- a) Determine λ .
- b) What is the expected life time of the computer?

- c) What is the probability that it will function less than 6 years? Discuss whether it agrees with your expectation when buying a PC.
- d) What is the name of this distribution? This distribution has a famous property. What is it? Do you think this property is realistic?

Qn 6

The number of attempts before achieving the first success can be considered as a discrete random variable with a probability mass function. Consider the following question.

The probability of a violin student getting the Distinction in an examination is 0.4. If the student wishes to get a Distinction, what is the expected number of attempts that the student takes the examination? Discuss the assumption(s) made behind your calculations.

[Hint: The probability distribution is a geometric distribution under certain assumptions. Please access the e-book A First Course in Probability in EE3001 Course Reserve Pg. 158-159 for information about the geometric distribution.]