Lab 7: INFR 4710

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1   Introduction

Welcome to the seventh lab! In this lab we will be learning about probability. The lab instructions are set as minimum expectations. You are always encouraged to go beyond the expectations. Challenge yourself, have fun, and learn more!

Remember that when you have finished your lab activities, you need to show your final results to your TA. They will provide feedback if necessary and record your mark. If you decided to do your lab remotely, you need to upload a PDF with your procedure and solutions. You can take pictures of your handwritten answers and upload them as a single PDF. The TA will then provide feedback if necessary and record your mark.

2   Tasks

The TA will give a short lecture on the basics of probability. You are asked to follow them in this lecture and ask questions if you are unsure of anything. Once the lecture is complete, you will have all the required skills to answer the following questions:

- You roll a fair die. What is the probability that the die lands on either 5 or 6? What is the probability that it lands on any other side?

- You draw a card from a deck of cards. What is the probability that the card is an Ace? Assume you did draw an Ace. What is the probability that the next card you draw is an Ace if you don't put back the drawn Ace to the deck? What if you put back the Ace to the deck? Does the probability changes?

- You get invited to participate in a lottery! In the first round, two people are randomly chosen from a group of ten people. In the second round, one of those two original people are chosen to be the winner of the lottery. What is the chance that you will win the lottery if you are one of the 10 people in round 1? What is the probability if you know that you are selected for Round 2?

- Two people are trying to hit a target at the gun range. Shooter A hits the target $\frac{3}{5}$ of the time and shooter B hits the target $\frac{1}{3}$ of the time. If each person shoots at the target once, what is the probability that the target gets hit?

- You flip two unfair coins. The probability of coin A landing on heads is $\frac{2}{3}$ and the probability of coin B landing on heads is $\frac{4}{5}$.

    - What is the probability of both coins landing on tails?

- What is the probability of at least one coin landing on heads?

- You add one more coin to the coin flip. This coin is fair. Now what is the probability that at least one coin lands on heads? (Hint: Don't treat this as a non-mutually exclusive event. Look at complement)

Deliverable: Write your answers to questions above with detailed explanations in a document and submit to the Canvas.