MAS291 - Assignment 1

Instructor: Dr. Nguyen Viet Anh

January 16, 2022

Deadline: Sunday, 23/1/2022.
How to submit: via Google Classroom.
You must submit your assignment in a **single** PDF file. It's allowed that two students can work and submit one copy together (but you can also work alone). But cheating is not allowed! If detected, you will get zero.

Exercise 1

Calculate the probability that a hand of 8 cards dealt from a normal shuffled pack of 52 contains exactly two aces and two kings. What is the probability that it contains exactly two aces given that it contains exactly two kings?

Exercise 2

A biased coin is tossed repeatedly. Each time there is a probability p of a head turning up. Let p_n be the probability that an even number of heads has occurred after n tosses (zero is an even number). Compute p_n. Hint: you can try to find a recurrence equation for p_n.

Exercise 3

Choose 3 random numbers a, b, c uniformly and independently from $1, \dots, 20$. Calculate

- $P(a + b > c)$,
- $P(a < b < c)$.
- $P(|a - b| > c)$

Exercise 4

Two fair dice are rolled. Suppose that the event that their sum is k is independent of the score shown by the first die. Find k, and explain why.