

Homework 1 (Due date 2025.03.05)

1. Consider a class of 25 students. Assume the birthday of each student is uniformly distributed over 365 calendar days, independent of other students. Decide the probability that they all have different birthdays by
 - counting
 - Poisson approximation
 - simulation
2. Bob has 2 classmates. Suppose the ratio in population for the blood types of AB, A, B, and O is 1 : 2 : 3 : 4. Decide the probability that both classmates are female given the following conditions.
 - One has blood type A.
 - One is a female with blood type A.
 - One is a female with blood type O.
3. Consider 12 persons with 6 males and 6 females. Divide them into 2 groups of 6 persons. What is the probability that both groups have an even number of males?
4. Consider a fair coin and a biased coin, which lands Heads with probability $2/3$. Suppose a coin is selected (with equal probability) and flipped twice, and the outcome is a head followed by a tail. What is the probability that the selected coin is fair?