

(*): Assigned to weekly problem set.

Simulation in R

1. The classic birthday problem asks: in a room of k people, what is the probability that at least two people share the same birthday (assuming no leap year, no twins, and all days equally likely). We will now ask a slightly different question. Using simulation in R, write a program to determine the number of people k needed for there to be a greater than 25% probability that there are at least *three* birthday matches. What about a greater than 50% probability?

The function `max()` might be useful. The function takes in a vector of output, and reports the maximum value in that vector.

2. (*) Under the same assumptions about birthdays as above:
 - (a) What is the theoretical probability that in our classroom of 22 people (Prof. Tang included), at least one person has the same birthday as you? Verify your answer using simulation in R.
 - (b) How does this compare to the probability of at least one match in the usual birthday problem? Explain intuitively why this difference might be.