12371 - LAB 15

Instructions

1. Access the auto-grader at https://c200.luddy.indiana.edu
2. Please write the code for the problems in python language
3. The code should be readable with variables named meaningfully
4. Plagiarism is unacceptable and we have ways to find it, so do not do it
5. Don't change the function signature (name of the function and number and types of arguments) provided in this file.
6. Once you pass all the tests on the auto grader, show your work to the teaching assistant

Problem

Imagine walking into a room filled with a certain number of people and making a bet of $50 on whether there are at least two individuals who share the same birthday. The challenge lies in determining the minimum number of people required in the room to make this bet favorable:

- With only one person, there is obviously no chance of a shared birthday.
- With 366 people, disregarding leap years, the probability of a shared birthday reaches 100% due to the pigeonhole principle.

Objective

The objective is to find the "breakeven point". Where does the probability change from being in the favor of not sharing to sharing?

Experimental Approach

To empirically determine this probability, one can simulate the scenario repeatedly:

1. Define the experiment: Enter a room with n people and record whether there is a shared birthday.
2. Perform the experiment multiple times for varying group sizes.
3. Calculate the empirical probability by dividing the number of successes (instances with at least one shared birthday) by the total number of trials.
4. Explain your observations to the TA.