CSE 103

Homework #1
Fall 2019

Due: Tue, October 8, 2019 at 11:00PM on Gradescope

1 Directions

There are two goals to this first assignment: (1) To practice typesetting your answers and submitting the HW through gradescope. (2) To do a quick review of basic concepts of combinatorics and probability that were covered in CSE21.

This assignment will be submitted individually and is **open to collaboration with other students**. You can post public questions about the assignment to Piazza, discuss the questions and their answers with other students, and ask questions in office hours.

Your answers have to be typeset, not handwritten. This is for two reasons: (a) to reduce ambiguity of the answers, and (b) to be kind to the TA's eyesight. We recommend you use latex, but you can also use word-processors that support mathematical formulas. More directions are available here: `https://tinyurl.com/y2gv9bn9`. A latex version of the HW is available from the class plan here: `https://sites.google.com/eng.ucsd.edu/cse103/class-plan`.

You will submit this assignment via Gradescope (`https://www.gradescope.com`) in the assignment called "Homework 1". You can submit each question as many times as you like. You should solve the problems and ask questions about them offline first, then try submitting once you are confident in your answers. **No late submissions are accepted.**

Note: Please enter the solution for each problem after the question and use **Gradescope** to mark a rectangle around your answer.

Special Latex Notation useful in this assignment: m choose k: $\binom{m}{k}$

2 Problems

1. Find the number of different ways of arranging two `R`'s and one `G`'s in a row. Write out all the patterns.

2. Find the number of different ways of arranging two `R`'s and three `G`'s in a row. Write out all the patterns.

3. A box contains two red balls and three green ones. Four draws are made at random with replacement from the box. Find the chance that:
(write the exact expression and the computed probability as integer percetages)

   (a) a red ball is never drawn

   (b) a red ball appears exactly once

   (c) a red ball appears exactly twice

   (d) a red ball appears exactly three times

   (e) a red ball appears on all the draws

   (f) a red ball appears at least twice

4. A die is rolled five times. Find the chance that:

   (a) an ace (one dot) never appears

   (b) an ace appears exactly twice

   (c) an ace appears exactly five times