Homework 3: 9/12 - 9/16

Instructions: Write-up complete solutions to the following problems and submit answers on Gradescope. Your solutions should be neatly-written, show all work and computations, include figures or graphs where appropriate, and include some written explanation of your method or process (enough that I can understand your reasoning without having to guess or make assumptions). A rubric for homework problems appears on the final page of this assignment.

- Unless otherwise noted, problem numbers are taken from the 2nd edition of Blitzstein and Hwang's *Intro to Probability*.

Monday 9/12

Chapter 2

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Additional Problems

AP1. Create an R function of 3 variables (a, b, p) that performs one game of gambler's ruin, assuming the first gambler starts with \$$a$, that the second starts with \$$b$, and that the first player has probability p of winning each bet. The output of the function should be the winner of the game.

Then use your function to approximate the probability that the first gambler wins, if $a = 2, b = 8$ and $p = 0.6$. Compare to the theoretical probability calculated in Section 2.7.

AP2. Suppose a fair 6-sided die is rolled until a 1 is shown. Compute the probability that an **odd** number of rolls are required. *Hint: Use first-step analysis.*

Wednesday 9/14

Chapter 3

1, 14, 20, 22

Friday 9/16

Chapter 3

9, 29, 31

General Rubric

Points	Criteria
5	The solution is correct **and** well-written. The author leaves no doubt as to why the solution is valid.
4.5	The solution is well-written, and is correct except for some minor arithmetic or calculation mistake.
4	The solution is technically correct, but author has omitted some key justification for why the solution is valid. Alternatively, the solution is well-written, but is missing a small, but essential component.
3	The solution is well-written, but either overlooks a significant component of the problem or makes a significant mistake. Alternatively, in a multi-part problem, a majority of the solutions are correct and well-written, but one part is missing or is significantly incorrect
2	The solution is either correct but not adequately written, or it is adequately written but overlooks a significant component of the problem or makes a significant mistake.
1	The solution is rudimentary, but contains some relevant ideas. Alternatively, the solution briefly indicates the correct answer, but provides no further justification
0	Either the solution is missing entirely, or the author makes no non-trivial progress toward a solution (i.e. just writes the statement of the problem and/or re-states given information)
Notes:	For problems with multiple parts, the score represents a holistic review of the entire problem. Additionally, half-points may be used if the solution falls between two point values above.