

Homework 8: 10/31 - 11/4

STA 335

Due 11:59pm Monday, November 7

Name: _____

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 10/31

Chapter 7

5, 9, 80

Additional Problems

AP1. Suppose X and Y are independent discrete random variables with $X \sim \text{Pois}(\lambda_1)$ and $Y \sim \text{Pois}(\lambda_2)$. Show that if $Z = X + Y$, then $Z \sim \text{Pois}(\lambda_1 + \lambda_2)$.

- Hint 1: Review AP2 from HW 4.
- Hint 2: The binomial theorem states that for any real numbers a and b , $(a + b)^n = \sum_{k=0}^n \binom{n}{k} a^k b^{n-k}$.

Wednesday 11/2

1, 12, 19

Friday 11/3

Chapter 7

32, 40, 55

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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 restates given information) |
| Notes: | <p>For problems with multiple parts, the score represents a holistic review of the entire problem.</p> <p>Additionally, half-points may be used if the solution falls between two point values above.</p> |