This problem set covers material from Week 7, dates 3/31 – 4/03.

Instructions: Write or type complete solutions to the following problems and submit answers to the corresponding Canvas assignment. 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 general rubric for homework problems appears on the final page of this assignment.

Monday 3/31

1. A food safety inspector is called upon to investigate a restaurant with a few customer reports of poor sanitation practices. The food safety inspector uses a hypothesis testing framework to evaluate whether regulations are not being met. If the inspector determines the restaurant is in gross violation, its license to serve food will be revoked.

   (a) Write the hypotheses in words (no population parameters necessary).

   (b) What is a Type I error in this context?

   (c) What is a Type II error in this context?

   (d) Which error is more problematic for the restaurant owner? For the diners? Why?

   (e) Do you think the diners would prefer a higher or lower significance level α compared to what the restaurant owner prefers? Explain.

2. Begin working on problems 1-5 in the associated `.qmd`. Problems 1-2 will be graded as a single problem as will problems 3-4.

   See rubric below for how I will grade coding style!

Wednesday 4/02

Continue working on problems 1-5 in the associated `.qmd`.

Thursday 4/03

Remaining problems 6-11 in the associated `.qmd`. Problems 6-7 will be graded as a single problem as will problems 8-9 and 10-11.

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:	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.
Notes:	For problems with code, well-written means only having lines of code that are necessary to solving the problem, as well as presenting the solution for the reader to easily see. It might also be worth adding comments to your code.

There will be an additional section of the rubric for good coding style. Each of the following is worth one point:

- Only including lines of code that are necessary to solving the problem. Comments in code may remain in your submission.
- Having meaningful (or at the very least, not misleading) variable names for objects in `R`.
- Having reproducible code where values are stored as variables for future use, and are actually *used*.
- Using in-line code for values that you report to the reader.
- Setting a seed in code chunks where random sampling occurs.