Question 1

For each of the following sets of hypotheses, determine whether committing a Type I error or a Type II error has greater real-world consequences. Explain your decision.

Part A

Imagine that the San Francisco Giants hold a book donation promotion for one of their games where every individual who brings a used book to the stadium is allowed free entry.

H_0: The number of individuals who wish attend the game will be no more than the capacity of the stadium.

H_A: The number of individuals who wish to attend the game will exceed the capacity of the stadium.

Part B

H_0: A new operating system is **no more effective** for Carbon Health to use on the computers at its clinics than the old operating system.

H_A: A new operating system is **more effective** for Carbon Health to use on the computers at its clinics than the old operating system.

Part C

H_0: The rate of COVID-19 infection on campus has not changed since last month.

H_A: The rate of COVID-19 infection on campus has increased since last month.

Question 2

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 he decides the restaurant is in gross violation, its license to serve food will be revoked.

Part A

Write the hypotheses in words.

Part B

What is a Type 1 Error in this context?

Part C

What is a Type 2 Error in this context?

Part D

Which error is more problematic for the restaurant owner? Why?

Part E

Which error is more problematic for the diners? Why?

Part F

As a diner, would you prefer that the food safety inspector requires strong evidence or very strong evidence of health concerns before revoking a restaurant's license? Explain your reasoning.