

### 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.