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Week 9: Regression and Simulation

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Graded Assignment 2 - Lobster Jack
Part 1

3.0/3.0 points (graded)

A restaurant owner Lobster Jack wants to find out what are the peak demand periods, during the hours of operation, in order to be better prepared to serve his customers. He thinks that, on average, he receives about 150 customers a day with 60% of the customers coming between 6:00pm and 8:59pm (equally distributed between that time) and the rest 40% customers coming at other times during the operating hours (again equally distributed). He wants to verify if that is true or not, so he asked his staff to write down during one week the number of customers that come into the restaurant at a given hour each day. His staff gave him the following data:

Time	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
5:00pm-5:59pm	15	19	21	20	12	15	15
6:00pm-6:59pm	30	23	24	25	28	29	26
7:00pm-7:59pm	36	29	39	35	39	30	32
8:00pm-8:59pm	29	33	23	29	24	32	27
9:00pm-9:59pm	21	20	12	19	18	14	20
10:00pm-10:59pm	12	12	15	12	10	15	14
11:00pm-11:59pm	8	7	9	10	12	12	9

Help the manager figure out if his instincts are correct or not. Use a Chi-Square test to see if the observed distribution is similar to the expected. Use the average demand for a given time as your observed value.

What is the p-value of your Chi-Square test?
Write your answer as a number with at least 3 decimal places.

0.662   ✔

0.662

Suppose that the owner wants to test if his initial hypothesis is accurate at 80% confidence interval. You set up the below Hypothesis test

H_0 : The actual sales distribution resembles the expected distribution at the 80% confidence level

H_1 : The actual sales distribution does not resemble the expected distribution at the 80% confidence level

Which of the following is true?
Choose the correct answer.

- ○ We reject the Null Hypothesis.

- ◉ We cannot reject the Null Hypothesis. ✔

- ○ We cannot make any decision.

Submit   You have used 1 of 2 attempts

Part 2

2/2 points (graded)
The owner now wants you to help him analyze his sales data. The restaurant is famous for its Lobo lobster roll. You were given some information based on which you deduced that the demand for the lobster roll was normally distributed with a mean of 220 and standard deviation of 50. You also know that the lobster supplier can provide lobster at a rate that mimics a uniform distribution between 170 and 300. One Lobster is used per roll and the lobsters need to be fresh (i.e. the restaurant can only use the lobsters that are delivered that day).

You decide to run 200 simulations of 1000 days each.

Calculate the expected sales of Lobster roll per day based on your simulation results.
Round to the nearest integer.

202   ✔

202

Use the expected sales from each of your 200 simulations to create a confidence interval for the average expected sales. What is the 95% confidence interval, L (Your confidence interval is mean +/- L), for this estimate?
Round to the nearest two decimal places.

0.16 ✔

0.16

| Submit | You have used 2 of 2 attempts |

✔ Correct (2/2 points)