

Exam

Applied Statistics

Problem 1	20 Points
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A restaurant owner wishes to find the 99% confidence interval of the true mean cost of a dry martini.

How large should the sample be if she wishes to be accurate within 0.10 €? A previous study showed that the standard deviation of the price was 0.12 €.

Problem 2	20 Points
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The following are the number of cars caught speeding each day on one speed camera over a two-week period:

10	12	15	9	8	12	11
6	15	17	12	10	9	7

1. What is the 95% confidence interval for this sample?
2. How does this compare with whole police average of 8 per day per camera?

Problem 3	30 Points
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A certain institution uses thousands of fluorescent light bulbs each year. The brand of bulb it currently uses has a mean life of 900 hours. A manufacturer claims that its new brand of bulbs which costs the same as the brand the institution currently uses, has a mean life of more than 900 hours.

The institution has decided to purchase the new brand if, when tested, the test evidence supports the manufacturer's claim at the 0.05 significance level.

Suppose 64 bulbs were tested and showed a mean of 920 hours and a standard deviation of 80 hours.

Should the institution purchase the new brand of fluorescent bulbs?

Problem 4**30 Points**

The following data give information on the lowest cost ticket price (in dollars) and the average attendance (rounded to the nearest thousand) for the past year for six football teams:

Ticket Price	Attendance
28.50	56
16.50	65
24.00	71
35.50	69
39.50	55
26.00	42

1. Find the least square regression equation by choosing the ticket price as an independent variable and the attendance as a dependent variable.
2. Calculate the coefficients of correlation and determination and explain what they mean.
3. Compute SST , SSR , and SSE .
4. Using the 1% level of significance, perform a t-test to check whether the slope of the regression line on ticket price and attendance is negative. Assume that the populations of both variables are normally distributed.
5. Construct a 1% confidence interval for β_1 .