

Econ 3040 - Assignment 2: Ice cream revenue and temperature

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Due date: October 18th, 2024. Worth 3% of your final grade.

Instructions:

- Submit your assignment in the “Assignment 2” drop box on UM Learn. Include your name and student number.
 - Do not copy and paste output from R. Format your results nicely.
 - Submit the R code that you used for each question in your assignment. Your assignment must have two parts: “Answers” and “R Code”.
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Do people buy more ice cream when it is hotter? If so, by how much? This assignment uses data from “Jen & Barry’s Ice Cream Stand”. Load the data using:

```
mydata <- read.csv("https://rtgodwin.com/data/icecream.csv")
```

The data contains information for 142 days of ice cream sales. The variables in the data are **revenue** - the dollar amount of sales made in a day, **temp** - the temperature in Celsius on that day, and **weekend** - a dummy variable equal to 1 if it was a weekend, and 0 if a weekday.

1. Using least squares, estimate the model: $revenue = \beta_0 + \beta_1 temp + \epsilon$. Report the estimated intercept and slope, and the estimated standard errors for each. Interpret the estimated value for the slope.
2. What is the R^2 for the estimated model in Question 1? Interpret this number.
3. Calculate the 95% confidence interval around the estimated slope. Interpret this interval.
4. “Ice Cream Age”, another ice cream stand located across town, said they make an extra \$4 dollars for every rise in 1°C . Test if this is true for “Jen & Barry’s Ice Cream Stand”.
5. Now, estimate the model: $revenue = \beta_0 + \beta_1 weekend + \epsilon$. Report the estimated values for β_0 and β_1 . What is the interpretation of b_0 and b_1 ? What is the average revenue on weekends?
6. Test the hypothesis that weekends bring in the same revenue as weekdays.