Effect of opening hours on Review's star rating and sentiment

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```
options(repos = c(CRAN = "https://cloud.r-project.org/"))
install.packages("fixest")
```

```
## Installing package into 'C:/Users/u160614/R'
## (as 'lib' is unspecified)
```

```
## package 'fixest' successfully unpacked and MD5 sums checked
##
## The downloaded binary packages are in
##  C:\Users\u160614\AppData\Local\Temp\RtmpMJh97C\downloaded_packages
```

```
library(fixest)
```

```
## Warning: package 'fixest' was built under R version 4.4.3
```

Introduction

Online reviews are becoming increasingly important in today's digital age, where word of mouth is no longer limited to knowledge circles. In many cases, new customers rely on other customers' reviews to choose restaurants. Highly positive reviews increase conversion rates, while negative reviews discourage purchases. Restaurants should therefore be aware of how online reviews reflect their performance. Customers specifically leave reviews based on multiple dimensions of their experience, including star ratings and sentiment through text. A restaurant's opening hours, which can vary widely depending on location and type of service, among other factors, can influence the reviews and sentiments expressed by customers. This quantitative study will look at how restaurant hours affect the reviews given by customers. Therefore, the central research question of this study is: *How are customer reviews affected by the opening hours of restaurants in the United States?* This will be answered by answering the following sub-questions: 1. *How are star ratings affected by the opening hours of restaurants?* 2. *How is the sentiment of customer reviews affected by the opening hours of restaurants?*

Hypothesis

Cleaning

Method

For sub question 1, our dependent variable is business star rating, which is the average star rating of all customers reviews for one business. This will be a categorical variable as we will them group into high star rating (4-5 stars) and low star rating (1-3 stars). The independent variable is opening hours, which is also categorical as it is separated into three groups: high, middle and low amount of hours opened. The variabel 'Open_hours' that is the total amount of hours opened a week, will be created by counting the opened hours of a restaurant for each day. Because both the dependent variable star rating and the independent variable opening hours are categorical a logistic regression model will return the relationship and give predictability scores.

For sub question 2, our dependent variable is the sentiment of customer reviews. This will be a continuous variable with a sentiment score, which represents the overall emotional tone of a review by summing the individual sentiment values of words. The more positive the sentiment score, the more positive the sentiment

in a review, and the other way around. The independent variable is opening hours with three groups (low, middle, high), similar to question 1. An ordinal logistic regression model will be used for sub question 2. The result of this model will give the probabilities of sentiment levels based on the opening hours of a restaurant.

Variable table

Variable Name	Description	Type	Operationalization	Possible Values
Star Rating	Average star rating for the restaurant	Categorical (Binary)	Grouped into High (4-5) and Low (1-3)	High, Low
Sentiment	Sentiment score of customer reviews	Continuous	Overall emotional tone of a review	Numbers from -... to ...
Opening Hours	Total hours restaurant is open	Ordinal	0-55 = low, 56-75 = middle, 76+ = high	Low, middle, high

Checking assumptions

add the pdf's (or png) of the plots ../../gen/output/ ... correct name

Results

table with significance

Conclusion