Comparing Cash-Only Restaurants To Restaurants That Accept Credit Cards Based on Data From the Yelp Open Dataset

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Date Prepared: December 16, 2025

Introduction

Back in my hometown, I have always thought that the more authentic and better-tasting restaurants were the ones that only took cash. The underground and authentic places that are beloved by locals and where generations of families have been going. Especially in an age where almost every single place accepts a credit card, are these restaurants actually good, or are they outdated and lower quality? In this paper, I will be comparing these two different types of restaurants based on user reviews, specifically from Yelp.

Data & Methods

In this project, I used the [Yelp Open Dataset](#), specifically from [Kaggle.com](#), for a truncated, easier-to-work-with version of the data. Each business had data about many different aspects of the business, but we specifically used its ratings, the type of business, its reviews, and whether or not it was cash only. At first, I used all different types of businesses, then narrowed my search down to only include restaurants. In the "categories" column of the dataset, I searched only for businesses that contained the word "Restaurant" in it. In the "attributes" column, I searched for businesses where the "BusinessAcceptsCreditCards" was equal to either true or false, and created lists of these so that I could compare the cash-only businesses to the ones that accepted credit cards.

Results

Originally, I was comparing all types of businesses, not just restaurants, which was not my intention, but I realized I could extract some information from it.
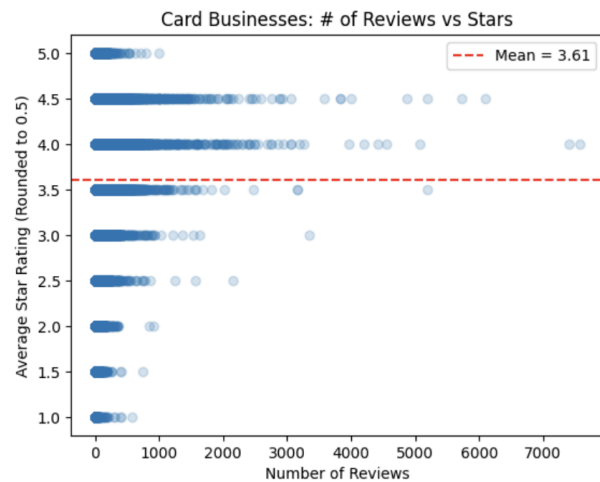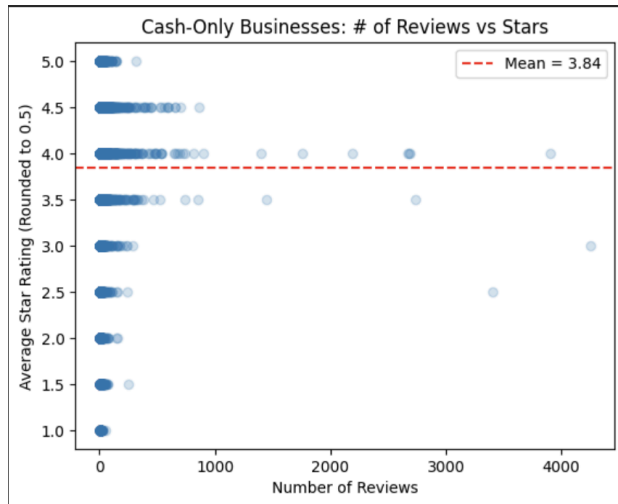
Here are two graphs I created where each dot represents one business. From these, I could see immediately that many more businesses accept credit cards, but also that the average star rating was slightly higher for the cash-only businesses. Then, I changed the data to reflect only restaurants, as shown below:
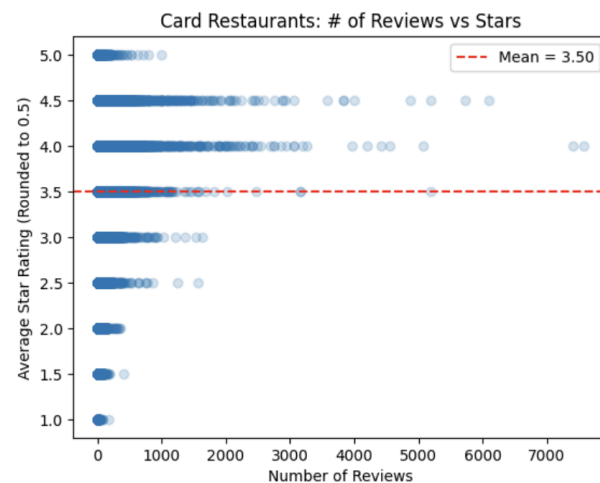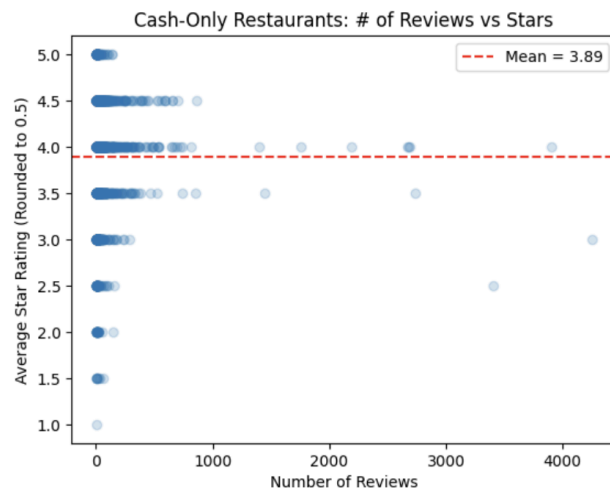
With restaurants, there is a larger difference between the mean star ratings compared to businesses. Some takeaways from these graphs are that there are still many more restaurants that accept credit cards than restaurants that only accept cash. These card restaurants also had a much higher number of reviews per business. Looking into this further, I constructed a bar chart with the average number of

reviews for each type of restaurant:

Average Yelp Review Count by Payment Type
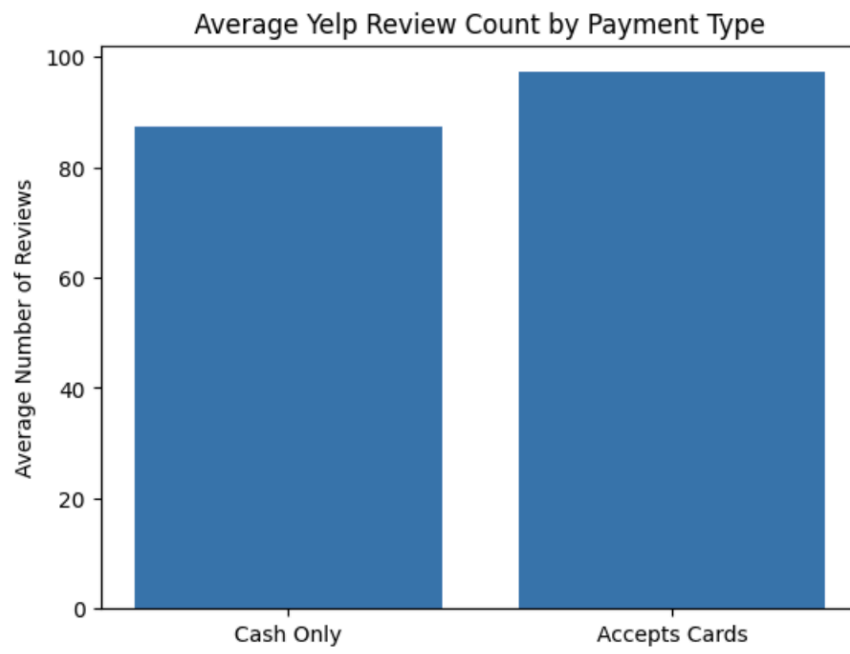
You can see the difference between the average number of reviews very clearly between the two types of restaurants in this graph. The average review count for cash-only businesses is 87.29, while the number for businesses that accept credit cards is 97.20. I also wanted to examine the star ratings more closely, so I wrote some code that gave me the following numbers:

```
Cash-Only Businesses: Number of Businesses by Star Rating
5.0: 83
4.5: 390
4.0: 448
3.5: 255
3.0: 140
2.5: 54
2.0: 26
1.5: 9
1.0: 1
Average Star Rating: 3.89
Average Review Count: 87.29

Card-Accepting Businesses: Number of Businesses by Star Rating
5.0: 1032
4.5: 6693
4.0: 11425
3.5: 10284
3.0: 6651
2.5: 4163
2.0: 2479
1.5: 1254
1.0: 160
Average Star Rating: 3.50
Average Review Count: 97.20
```

Both of the restaurants have most of their reviews at 4.0 stars, but the cash-only restaurants have a higher proportion of 4.5 and 5.0 star ratings, and a lower proportion of 1.0 and 1.5 ratings compared

to the 4.0 median. This would contribute to the higher mean star rating for cash-only businesses than for businesses that accept credit cards.

Discussion

Overall, this data helped us answer a lot of questions, but also created even more questions for us. Since there are fewer cash-only restaurants and their average review count is lower, we are taking a smaller sample size. This means the data may not be 100% accurate because what if there are a lot of people out there who eventually come to review these cash-only restaurants and really hate them? They could also really love them, though, and raise their ratings. We simply do not know. Also, the dataset that I was working with is only a small sample of the total number of businesses/restaurants that are in the country and in Yelp's database. The webpage clearly states, "The Yelp Open Dataset is a subset of Yelp data that is intended for educational use. It provides real-world data related to businesses, including reviews, photos, check-ins, and attributes like hours, parking availability, and ambience". There were also a lot of businesses in the dataset that did not contain information about whether they accepted credit cards or not, which I excluded. Finally, I would also note that there are probably some ratings out there for cash-only businesses that are lower because that person did not like the fact that the business was cash-only. This would not correctly reflect the quality of the restaurant based off the standards that we are using.

Conclusion

Overall, I think it is safe to say that from this dataset, the cash-only restaurants scored higher Yelp ratings than restaurants that accepted credit cards. That is not to say, though, that this conclusion is totally accurate for all the reasons I stated in the discussion. I would put some faith into this conclusion, though, because in my personal experience, my favorite restaurants are the ones that only accept cash.