Maximizing Revenue in Taxi Services through Payment Type Analysis

Presented by
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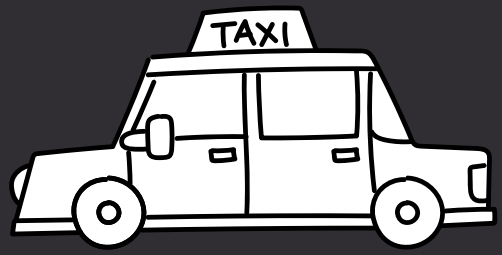


Objective and research question

Objective

The primary aim of this project is to conduct an A/B test to analyze the correlation between total fares and payment methods. We use hypothesis testing and statistical analysis in Python to determine if there is a significant difference in fares associated with credit card payments versus cash payments.

Research Question

Does the payment method correlate with the total fare amount? Can we encourage customers to use payment methods that potentially generate higher revenue for drivers without negatively impacting their experience?

Problem Statement

This study investigates the potential impact of different payment methods (cash or card) on taxi fares. By employing statistical analysis, we aim to explore how these methods could influence fare amounts and guide customers towards more profitable payment options without compromising service quality.

Methodologies used:

1.Hypothesis testing
Conducted a T test to evaluate the relationship between payment type and fare amount , testing the hypothesis of different payment methods influence fare amounts.

2. Linear Regression
Implemented a Linear regression to explore a relationship between trip duration (calculated from pickup and drop off times) and fare amount.

Data Overview

Dataset used is NYC taxi trip records , used data cleaning and feature engineering procedures to only focus on relevant data columns

Columns used :

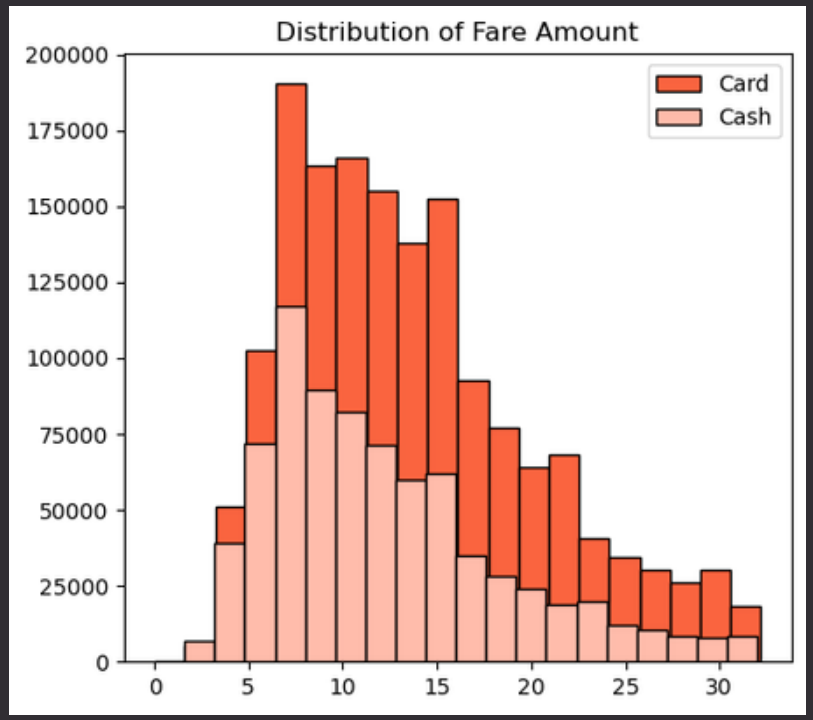
1. passenger_count (1 to 5)
2. payment_type (cash or card)
3. fare_amount (time and distance fare calculated by meter)
4. trip_distance (the elapsed trip distance in miles reported by taximeter)
5. duration (min seconds)

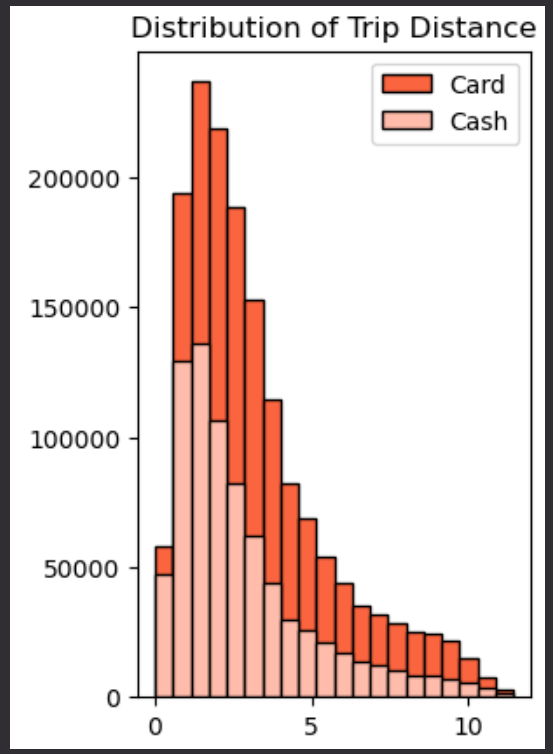
	passenger_count	payment_type	fare_amount	trip_distance	duration (min seconds)
2056	1	2	7.0	0.00	0.000000
2441	1	1	52.0	0.00	0.200000
2446	2	1	9.5	1.70	13.066667
2465	1	1	4.0	0.40	3.083333
3344	1	1	6.0	1.20	5.350000

Journey Insights

- The people who pay with card have slightly higher average than the people who pay with cash.

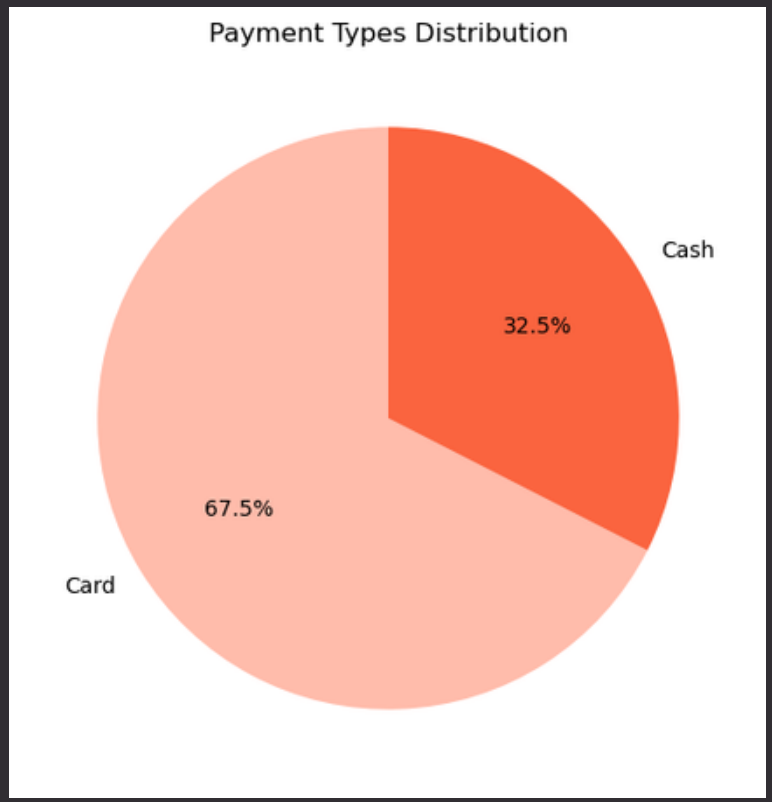
- This indicates the customers prefer to pay more with cards than the cash/





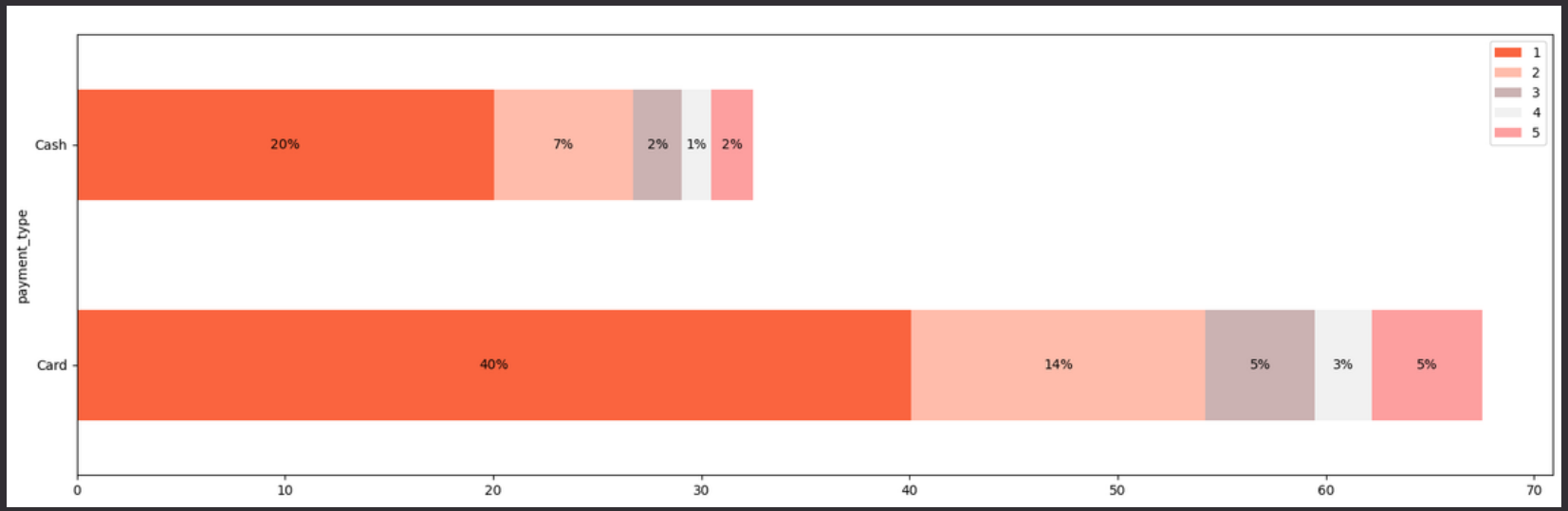
Journey Insights

- The proportion of people who prefer to pay with card is significantly higher than the people who pay with cash.
- This indicated the stronger preference with payment with card and not cash



Journey Insights

- Predominance of Single Riders: Both card and cash payments are most frequently used by single passengers, with card payments at 40% being twice as common as cash.
- Preference for Cards: Across all passenger counts, card payments are more popular than cash, suggesting a general preference for digital transactions over cash.
- Decrease with More Passengers: Usage of both payment methods decreases as passenger count increases, indicating solo travelers are the primary customers.
- Balanced Cash Use: Cash payment distribution is more balanced across different passenger counts compared to card payments.
- Opportunity for Growth: The higher rate of card usage presents an opportunity to further incentivize and streamline card payments for increased revenue.



Hypothesis testing

Null hypothesis: There is no difference in average fare between customers who use credit cards and customers who use cash.

Alternative hypothesis: There is a difference in average fare between customers who use credit cards and customers who use cash.

With a t-statistic value of 165.5 and a p-value of less than 0.05, we reject the null hypothesis, suggesting that there is indeed significant difference between average fare between customers who use credit cards and customers who use cash.

Linear Regression

Identifying the relationship between fare amount and the trip duration using linear regression.

For every extra minute you spend in a taxi, you can expect the fare to go up by about 74 cents, and this increase is pretty consistent every time you ride.

	coef	std err	t	P>|t|	[0.025	0.975]
const	2.1716	0.005	448.391	0.000	2.162	2.181
duration (min seconds)	0.7373	0.000	2552.720	0.000	0.737	0.738

Recommenndations

- Given the higher frequency of card payments across all passenger counts, encourage the use of cards through incentives like cashback offers or reward points to increase customer convenience and drive revenue.

- Develop targeted marketing campaigns aimed at solo riders who predominantly use cards, capitalizing on this demographic to boost usage rates and overall profitability.

- Implement strategies, such as optimized routing or off-peak travel incentives, to manage trip durations effectively, as longer rides significantly contribute to higher fares and increased revenue.