Maximizing revenue for NYC Yellow Taxi Drivers

By Payment Method Analysis

Overview

- **Problem Statement:** Yellow Taxi services face competition from ride-sharing companies and need to maximize revenue while ensuring driver satisfaction.
- **Project Objective:** Utilize data-driven insights to maximize revenue streams for taxi drivers.
- **Data Overview:** Analysis of NYC Taxi Trip records for 2024, focusing on passenger count, payment type, fare amount, trip distance, and duration.
- **Analysis and Findings:** Insights into customer preferences, payment trends, and the impact of payment methods on fare amounts.
- **Recommendations:** Strategies to optimize revenue.

Problem Statement

Yellow Taxi services has been a prominent cab services in the city of New York,with several players entering this market like Uber, we want to make the most of the revenue as it is very essential for long-term success and driver's happiness while maintaining customer satisfaction

The key goal is to use data-driven insights to maximise revenue streams for taxi drivers in order to meet this need. My research aims to determine whether payment methods have an impact on fare pricing by focusing on relationship between payment type and fare amount

Question to analyse:

Is there a relationship between total fare and payment type?

Can we nudge customers towards payment methods that generate higher revenue for drivers without negatively impacting customer experience?

Data Overview

For this analysis we utilized the latest comprehensive dataset of NYC Taxi Trip records for 2024.

We implemented rigorous data cleaning , removed outliers using statistical methods and used feature engineering procedures to concentrate solely on relevant columns essential for our investigation.

Link for complete Dataset
TLC Trip Record Data - TLC (nyc.gov)

Relevant columns used for this research:

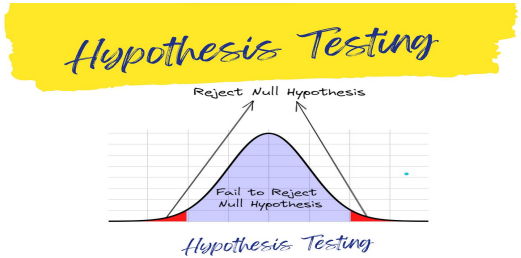
- Passenger-count
- Payment_type
- Fare_amount
- Trip_distance
- Duration

	passenger_count	payment_type	fare_amount	trip_distance	duration
0	1.0	Cash	17.7	1.72	19.800000
1	1.0	Credit Card	10.0	1.80	6.600000
2	1.0	Credit Card	23.3	4.70	17.916667
3	1.0	Credit Card	10.0	1.40	8.300000
4	1.0	Credit Card	7.9	0.80	6.100000

Methodology

Descriptive Analysis

Performed statistical analysis to summarize key aspects of the data focussing on fare amounts and payment types



Extensive Data Cleaning

Filtered the required columns , removed irregular values, null values ,outliers and modified the data according to our needs

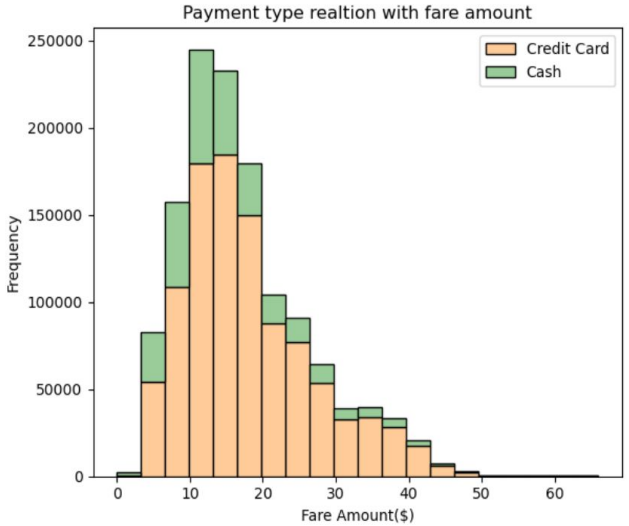
Hypothesis testing

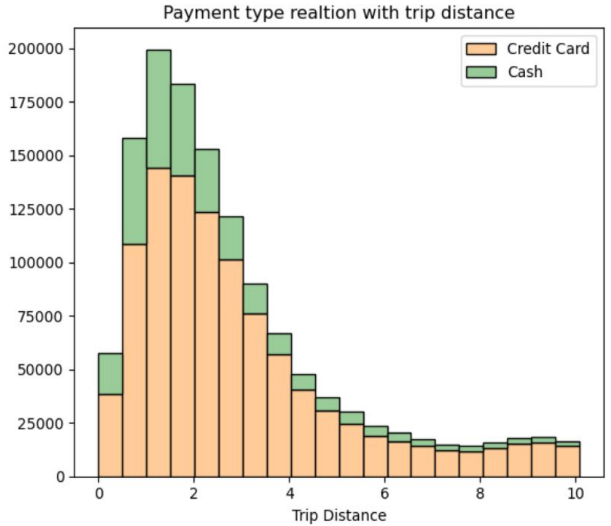
Conducted a T-test to evaluate the relationship between payment type and fare amount, testing the hypothesis that different payment methods influence fare amounts.

Journey Insights

Customers paying with Credit cards tend to have a slightly higher average trip distance and fare amount compared to those paying with cash

Indicating that customers prefer to pay more with Credit Cards when they have higher fare amount and Longer trip distance



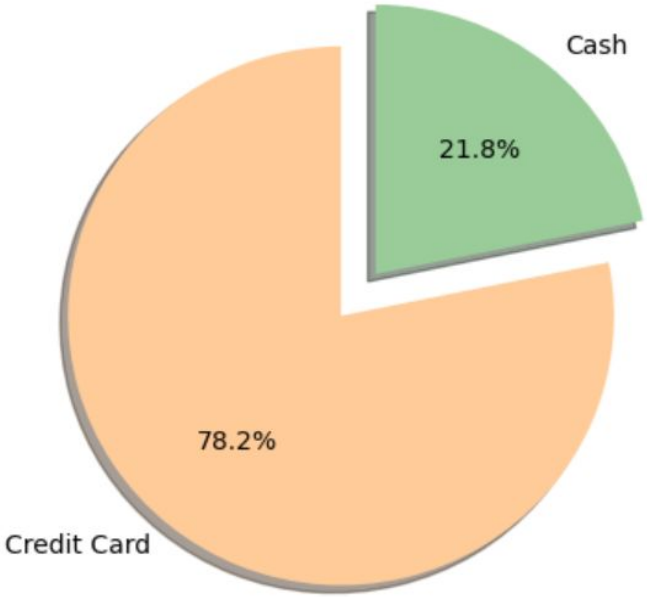


	Payment	Mean	Standard deviation
Fare Amount	Credit Card	18.2 $	9
	Cash	15.3 $	8.5
Trip distance	Credit Card	2.98 Miles	2.2
	Cash	2.39 Miles	2

Preference of Payment Types

The Proportion of customers paying with cards is significantly higher than those paying with cash, with Credit card payments accounting for more than 78% of all transactions compared to merely over 21 % cash payments.

This indicates a strong preference among customers for using card payments over cash, potentially due to convenience,security or incentives offered by Credit Card companies for transactions.

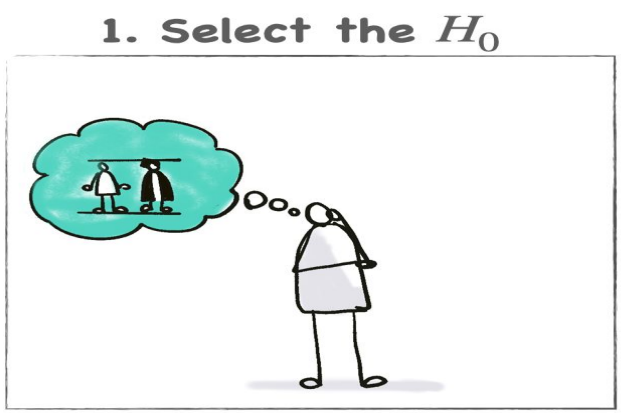


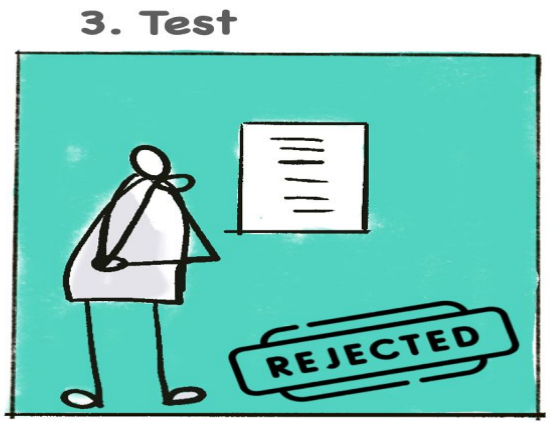
Hypothesis testing

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

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

With a T-statistic of 156.5 and a p value less than 0.05, we reject the null hypothesis, suggesting that there is indeed a significant difference in average fare between the two payment methods

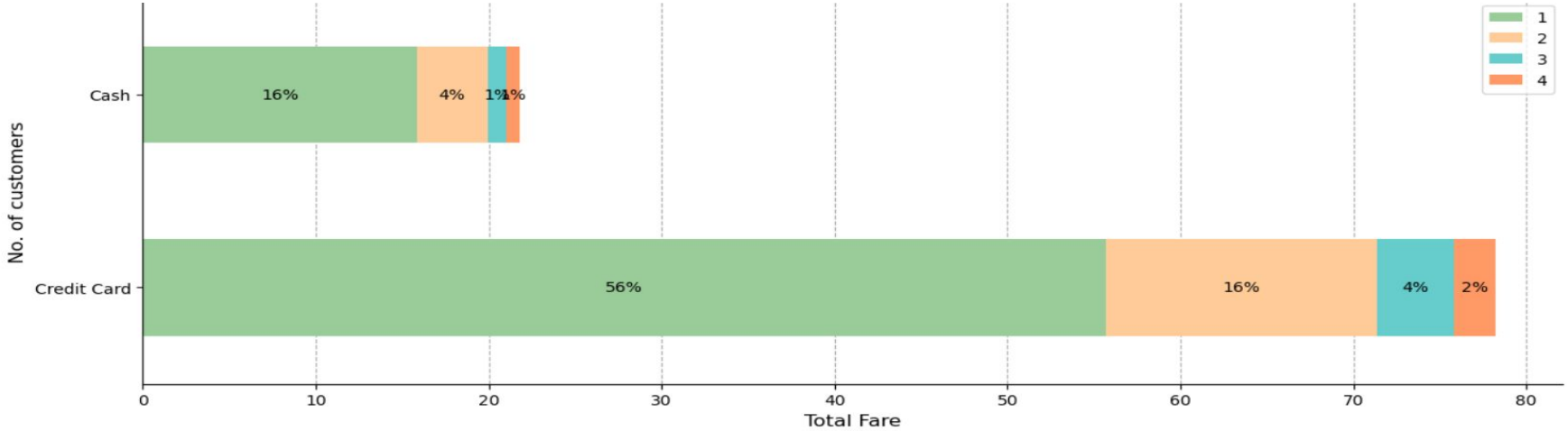




Customer behaviour Analysis

- Among Credit card payments rides with a single passenger comprises the largest proportion, constituting 56% of all Card transactions.
- Similarly cash payments are predominantly associated with single-passenger rides.
- There is a noticeable **decrease in the percentage of transactions as the passenger count increases**,suggesting that ***larger groups are less likely to use taxis.***

These insights emphasize the importance of considering both payment method and passenger count when analyzing transaction data, as they provide valuable insights into customer behaviour and preferences



Strategic Recommendations

- Focus marketing efforts on areas with high potential single travelers.
- Implement discounting or coupon strategies for credit card transactions.
- Partner with digital wallet companies like Apple Wallet , Google Pay to offer cashback incentives.
- Analyze trip paths to identify popular pickup and drop-off locations among single travellers

Thankyou