MAXIMIZING REVENUE FOR TAXI CAB DRIVERS THROUGH PAYMENT TYPE ANALYSIS

Presented by Binoy Patra

Introduction

In the dynamic taxi booking industry, optimizing revenue is crucial for sustained success and driver satisfaction. This project aims to leverage data-driven insights to maximize earnings potential for taxi drivers by analyzing the relationship between payment methods and fare amounts.

Business Problem

Taxi cab drivers need strategies to enhance revenue streams amidst competitive pressures and evolving customer preferences for payment methods. Understanding how payment type impacts fare amounts can provide actionable insights to increase earnings and customer satisfaction.

Objective

To determine if there is a significant difference in fare amounts based on payment type and to explore strategies that can potentially increase revenue for taxi cab drivers without compromising customer experience.

Research Question

Is there a relationship between total fare amount and payment type, and can promoting certain payment methods increase revenue for taxi cab drivers?

Data Overview

For this analysis, we utilized the comprehensive dataset of NYC Taxi Trip records, used data cleaning and feature engineering procedures to concentrate solely on the relevant columns essential for our investigation.

Relevant columns used for this reseach

- ❖ passenger_count (1 to 5)
- ❖ trip_distance (Miles)
- ❖ duration (Minute)
- ❖ payment_type (card or cash)
- ❖ fare_amount

|	passenger_count	trip_distance	duration	payment_type	fare_amount
0	1.0	1.2	4.800000	1.0	6.0
1	1.0	1.2	7.416667	1.0	7.0
2	1.0	0.6	6.183333	1.0	6.0
3	1.0	0.8	4.850000	1.0	5.5
4	1.0	0.0	2.300000	2.0	3.5

Journey Insights

❖ Credit card payments show a higher average fare of $13.60 with greater variability ($6.37 standard deviation) compared to cash payments, which average $12.18 with a standard deviation of $6.13.

❖ This suggests potential opportunities for revenue optimization through targeted payment method incentives in taxi services.
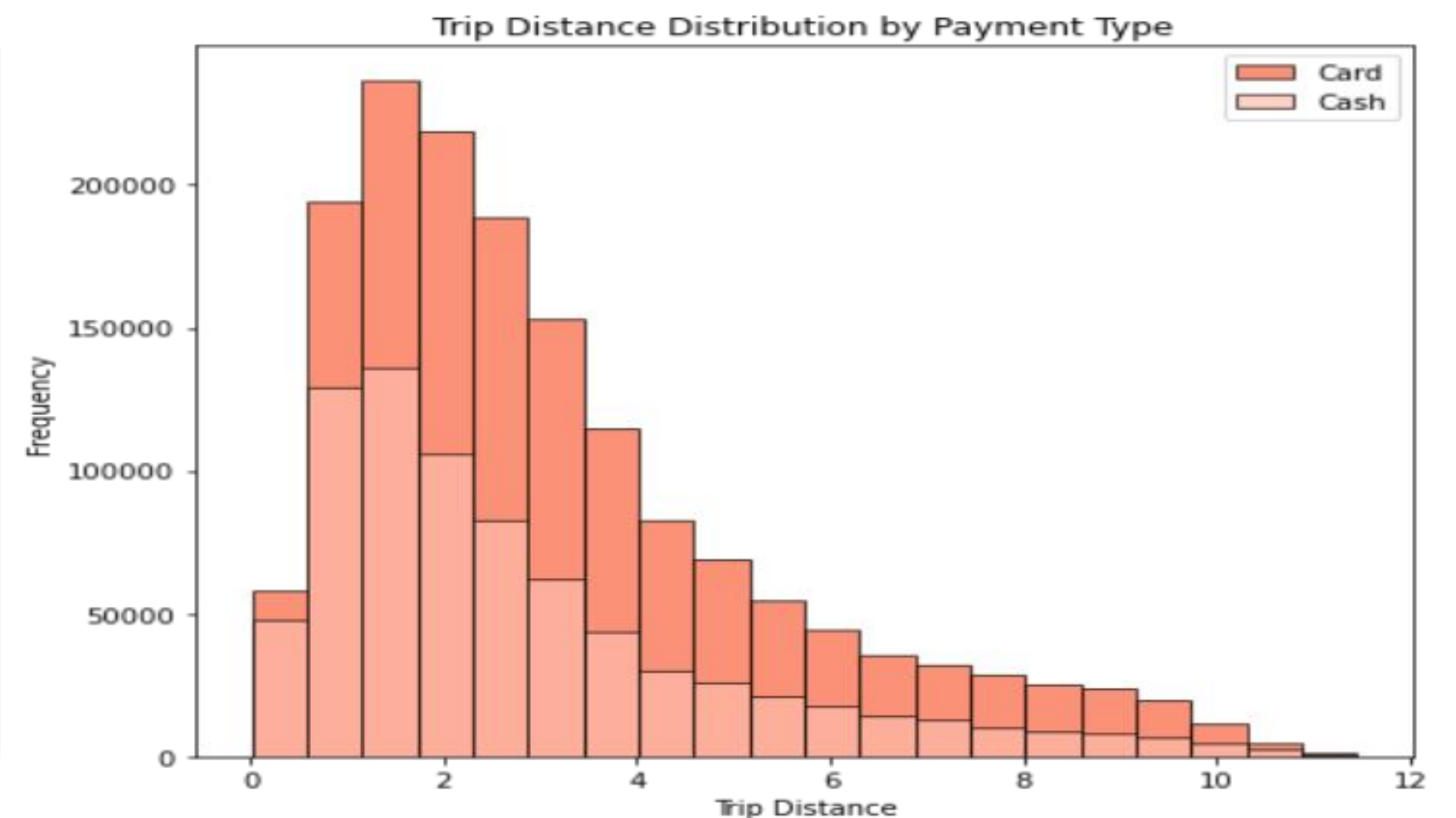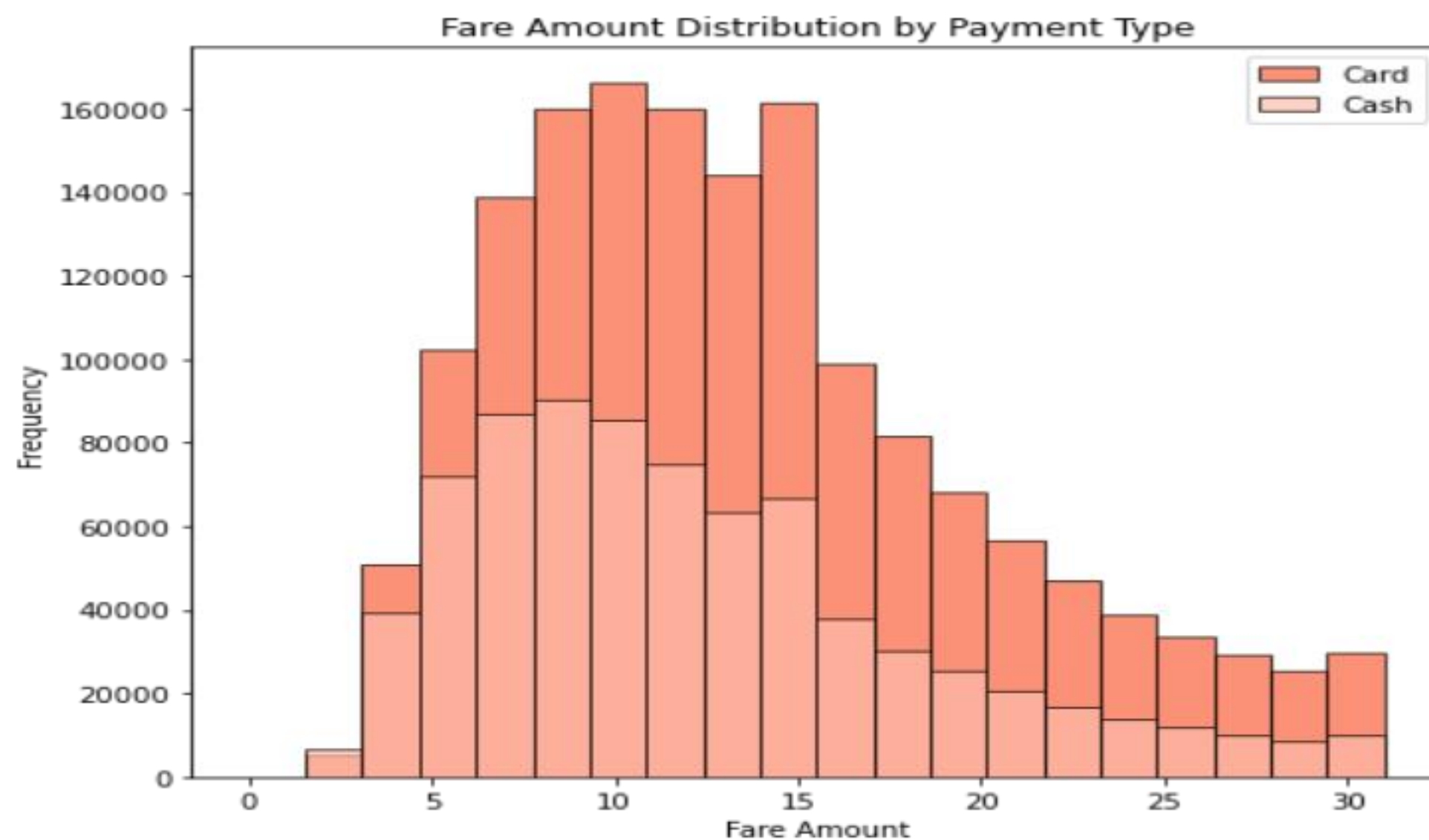
Preference of Payment Types

❖ Card payments account for 67.5% of all transactions, showing a clear preference over cash (32.5%).
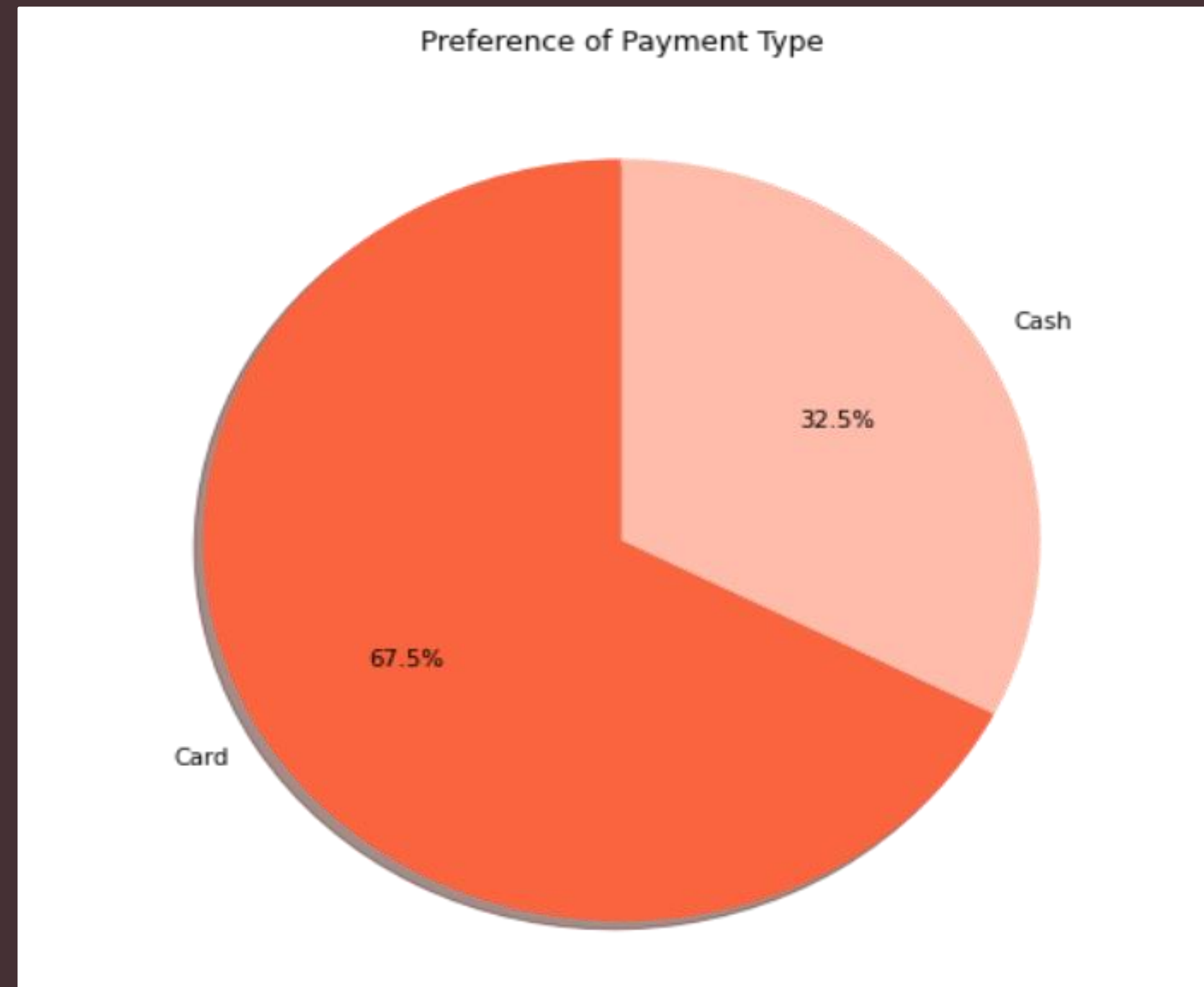
Passenger Count Analysis

❖ Single-passenger rides are predominant in both card (40.08%) and cash (20.04%) transactions.

❖ Larger groups show a decrease in transaction percentage, suggesting potential behavior patterns regarding group size and preferred payment methods.

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

Stacked Bar Chart with Percentage Labels
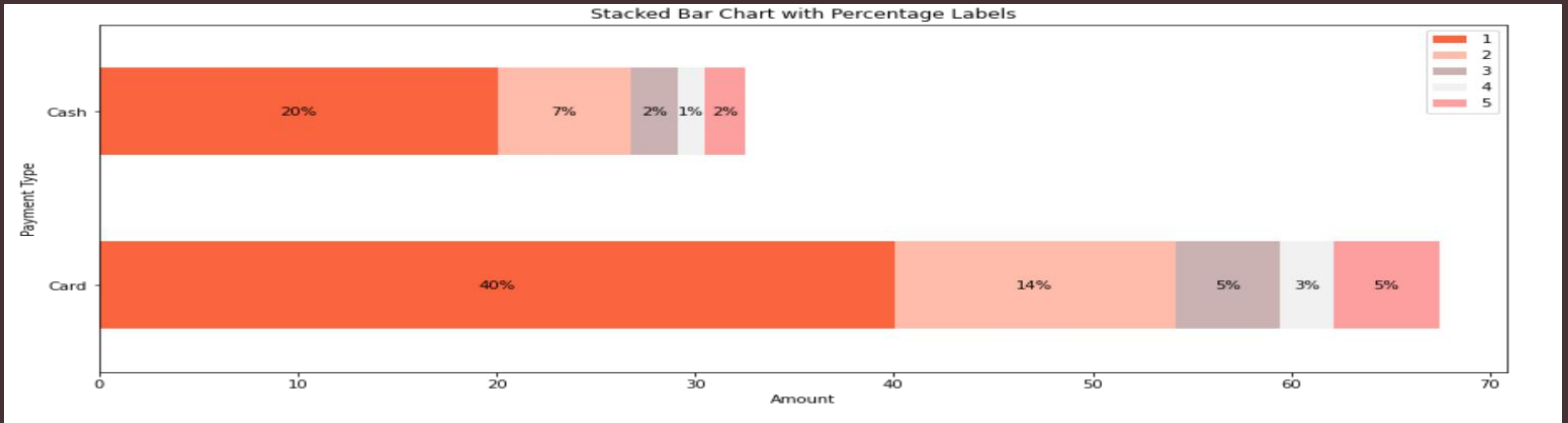
Hypothesis Testing

❖ 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.

Result

❖ With a T-statistic of 165.5 and a p-value less than 0.05, we reject the null hypothesis, indicating a significant difference in average fare between credit card and cash payments.

❖ This finding supports the hypothesis that payment type influences fare amounts in taxi transactions.

Recommendations

1. Encourage Credit Card Payments

    ❖ Implement incentives or discounts for credit card transactions to encourage more customers to use this payment method.

    ❖ Enhance security and convenience of credit card transactions to boost adoption rates.

2. Optimize Payment Infrastructure

    ❖ Invest in reliable and efficient payment processing systems to minimize transaction failures and delays, ensuring a smooth experience for customers using credit cards.

This structured approach provides a comprehensive view of how payment methods impact fare amounts and offers strategic recommendations to maximize revenue for taxi cab drivers.