# Taxi Revenue Analysis & Hypothesis Testing

Complete Project: Charts, Business Impact & Future Scope

Executive Summary

- Project based on NYC Yellow Taxi data (Jan 2020)

- Card payments contribute ~75% of total trips

- Card users take longer trips and pay higher fares

- Hypothesis testing confirms higher revenue from card payments

- Strong opportunity to increase revenue via digital payments

Fare Amount Distribution (Card vs Cash)
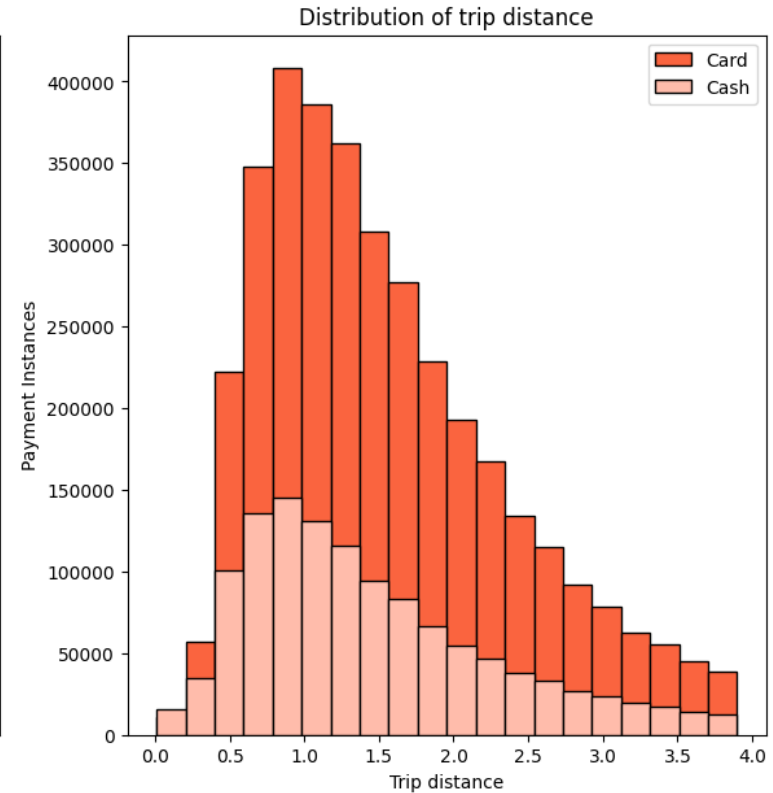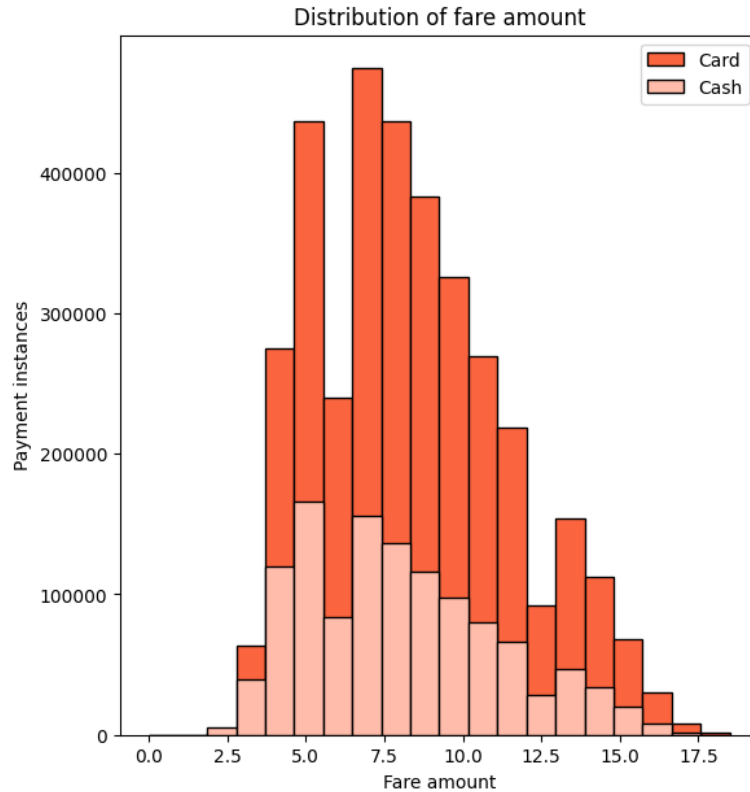
Fare Distribution – Insights

- Shows distribution of fare amounts across trips
- Higher fare ranges dominated by card payments
- Cash payments concentrated in lower fare ranges
- Card users generate higher revenue per trip
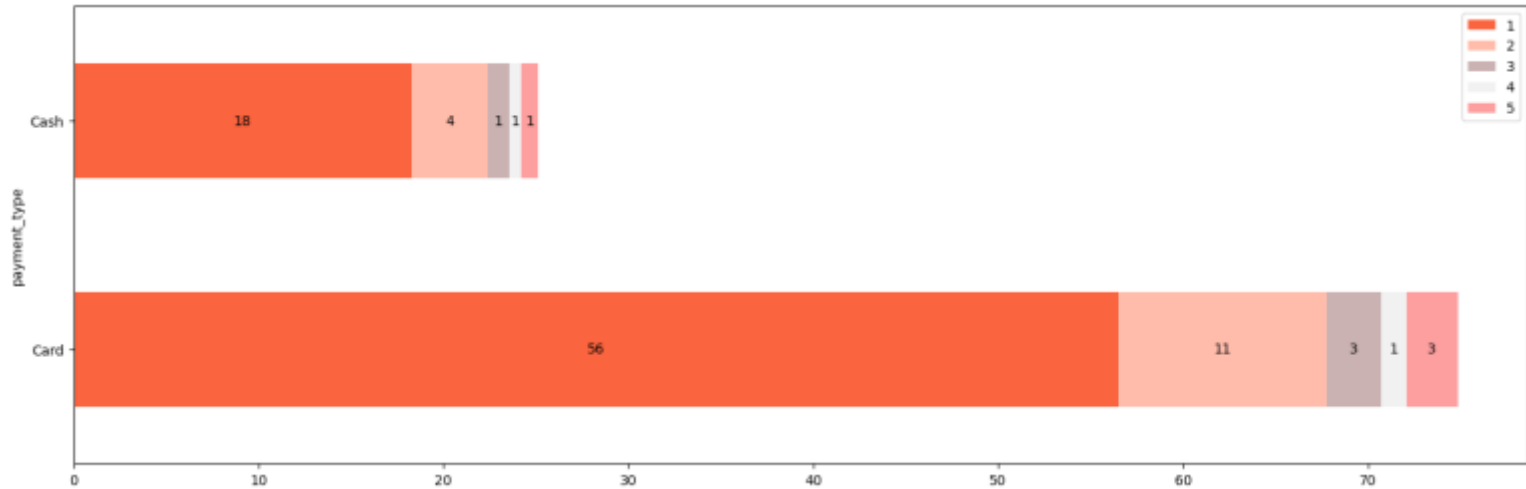- Business impact: promote card usage to increase ARPU

Trip Distance Distribution (Card vs Cash)
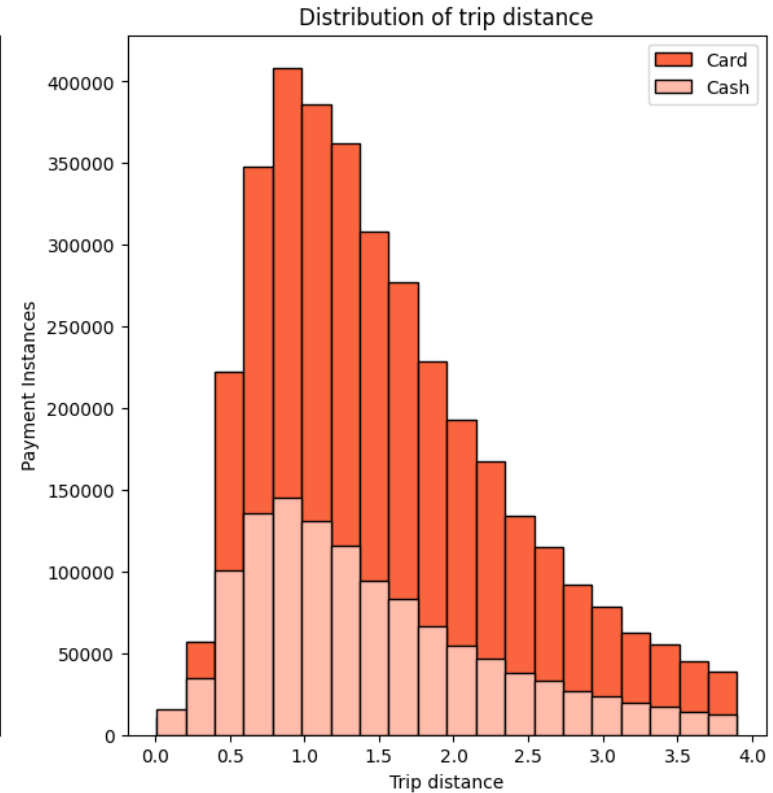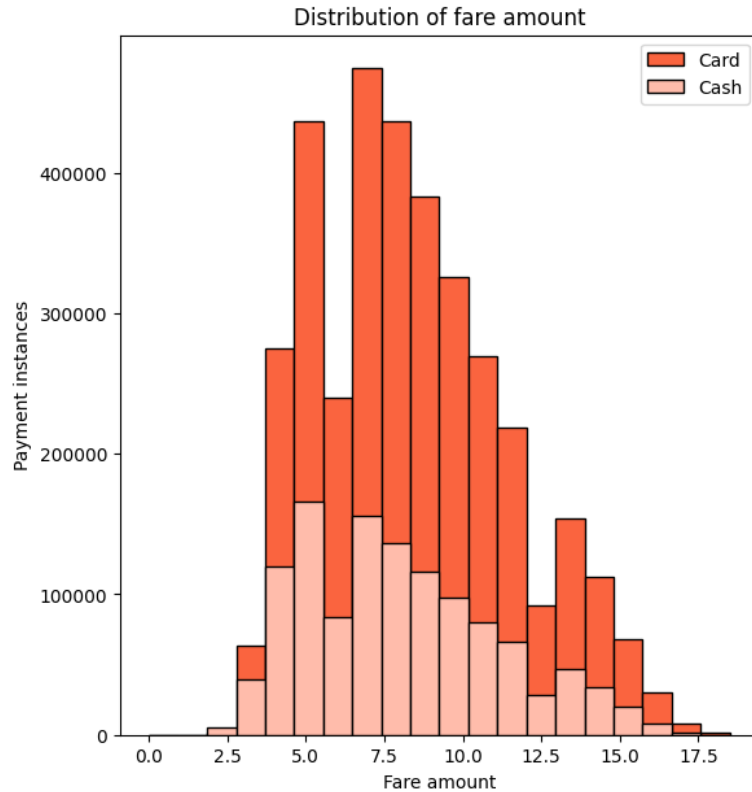
Trip Distance – Insights

- Most trips are short-distance
- Long-distance trips mostly paid via card
- Longer distance leads to higher fare
- Card payments preferred for convenience
- Business impact: incentivize card usage for long trips

Passenger Count vs Payment Type

Passenger Count – Insights

- Single-passenger trips are most common
- Card payments dominate across all passenger counts
- Group trips also show strong card usage
- Payment behavior consistent across categories
- Business impact: target both solo and group riders
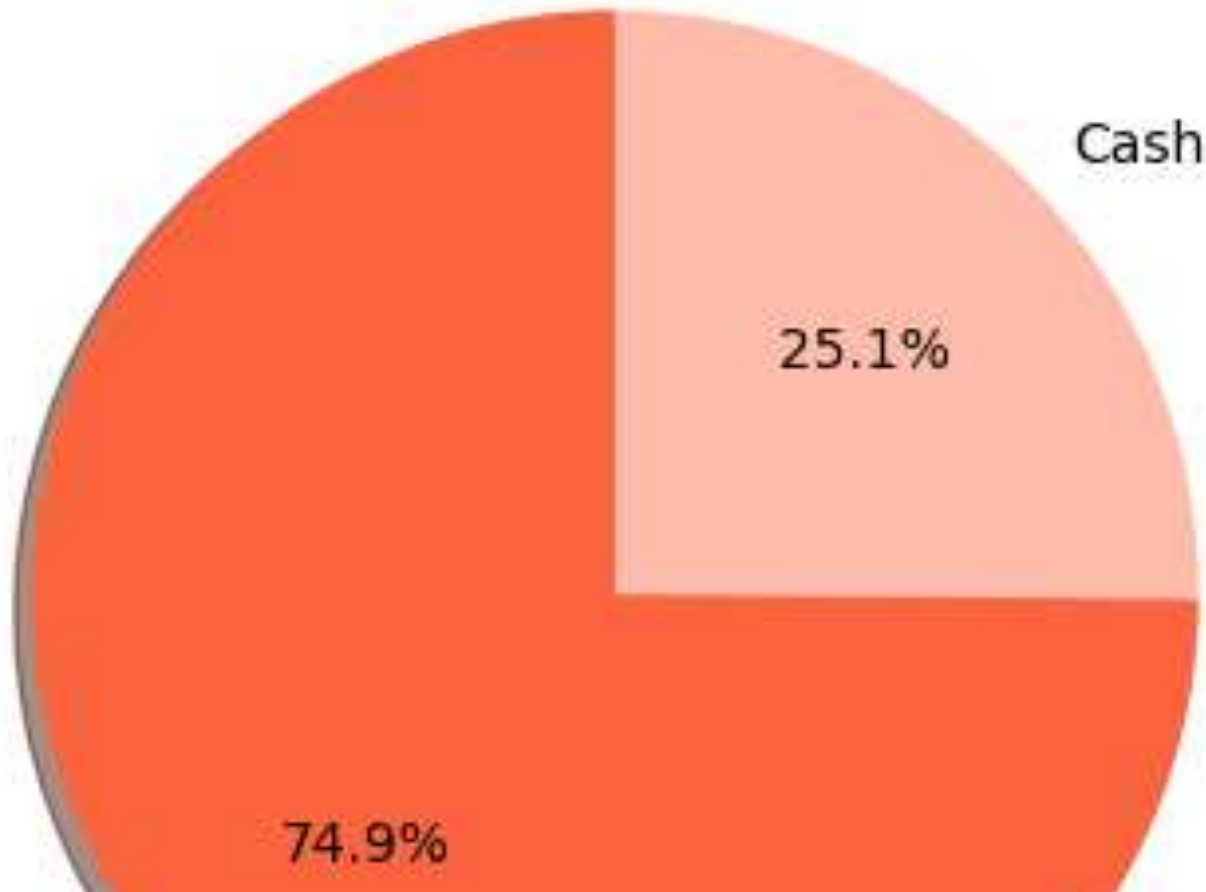
Normality Test (Q-Q Plot)
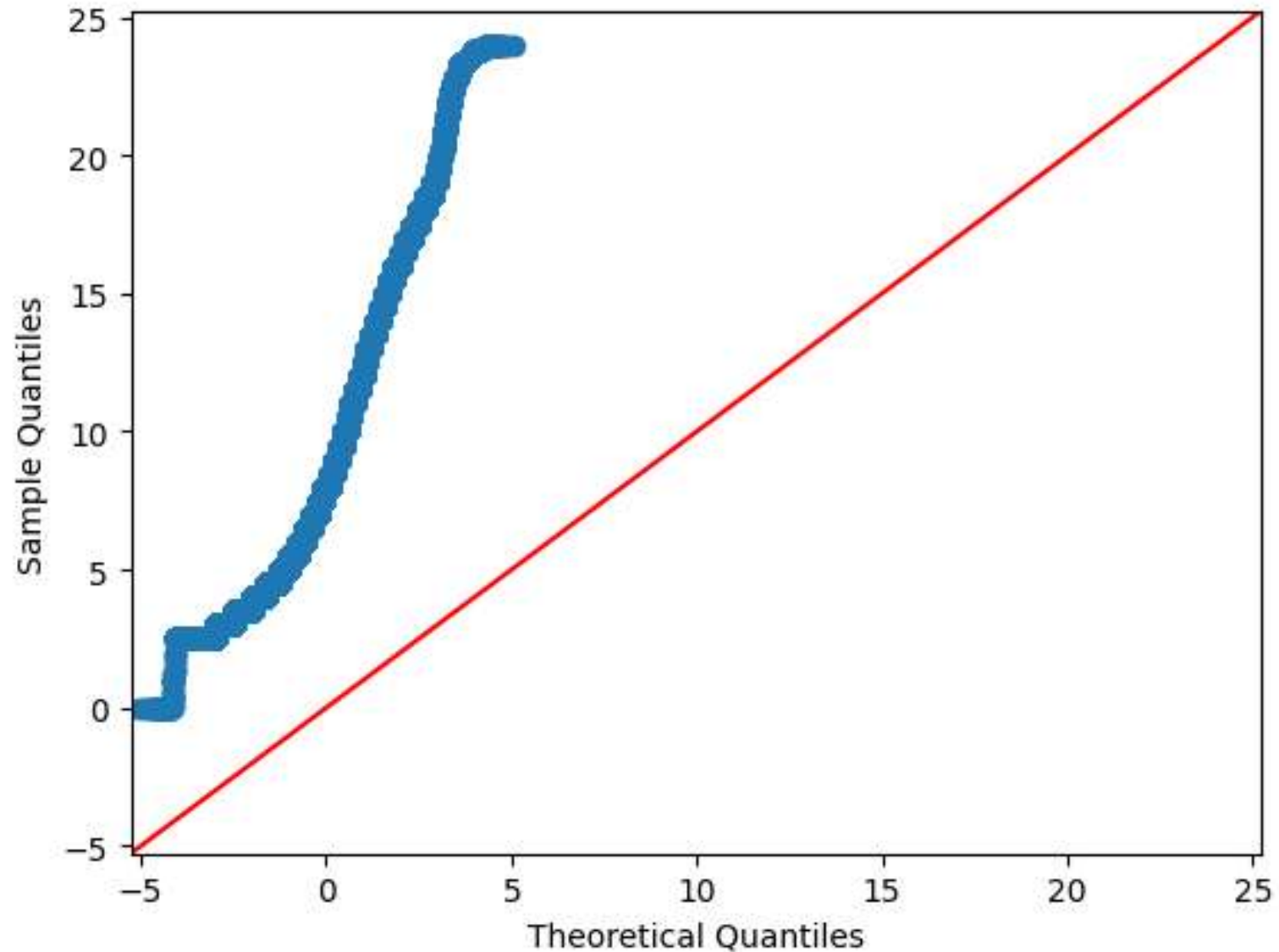
Normality Test – Insights

- Checks whether fare data follows normal distribution
- Deviation at higher values indicates right skewness
- Presence of outliers in fare data
- Real-world pricing data is non-normal
- Business impact: use median & percentiles over mean

Payment Type Percentage

Percentage of Payment Types

Payment Type – Insights

- Approximately 75% payments via card
- Only 25% trips use cash payments
- Clear customer preference for digital payments
- Supports cashless payment strategy
- Business impact: reduce cash handling costs

Hypothesis Testing Result

- Null Hypothesis (H_0): Card and Cash average fares are equal

- Alternative Hypothesis (H_1): Card payments have higher average fare

- Statistical test produced p-value < 0.05

- Null hypothesis rejected

- Conclusion: Card payments significantly increase revenue

Business Impact

- Increase in average revenue per trip
- Lower operational and security cost due to less cash handling
- Faster and smoother customer transactions
- Better pricing and promotion strategies
- Supports data-driven business decisions

Project Conclusion

- Customer payment behavior strongly impacts revenue
- Statistical and visual analysis aligned
- Card payments proven to be more profitable
- Project shows real-world application of hypothesis testing
- Analytics can directly support business growth

Future Scope & Industry Applications

- Applicable to ride-hailing, logistics, food delivery, retail

- Integration with real-time data for dynamic pricing

- Machine learning for customer segmentation

- Location and time-based demand forecasting

- Supports digital transformation initiatives