**Executive Summary: NYC Taxi Data Analysis**

**Overview**

This analysis investigates fare patterns within New York City’s taxi services, specifically exploring whether the method of payment (cash vs. credit card) influences the average fare amount. Using statistical methods, we analyzed a subset of NYC TLC data to derive insights that can inform operational and financial strategies.

**Problem**

The New York City Taxi and Limousine Commission (TLC) seeks to optimize revenue and service delivery. However, it is unclear whether payment method impacts the total fare paid by customers. Without clarity on this, opportunities for revenue optimization may be missed.

**Solution**

We conducted an A/B test using historical trip data to compare average fare amounts between credit card and cash payments. Descriptive statistics were computed, followed by a hypothesis test to determine if the difference in fares between payment types was statistically significant.

**Key Insights**

The hypothesis test revealed a **statistically significant difference** in average fare amounts.

**Credit card payments** are associated with **higher average fares** than cash payments.

This suggests that credit card users may take longer trips or tip more frequently, leading to greater revenue per ride.

**Next Steps**

Conduct a **multivariate analysis** that controls for trip distance, pickup/drop-off locations, and time of day to isolate the impact of payment method.

Evaluate **customer demographics and behavior** to understand why credit card users pay more.

Consider **incentive programs** encouraging credit card use, such as rewards or faster service.

**Impact**

These findings highlight a **potential revenue optimization strategy** for TLC and taxi operators. Promoting credit card usage could increase total fare revenue. This insight can shape marketing campaigns, driver incentives, and policy decisions to enhance profitability and efficiency across the system.