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# *Taxi Fare Analysis*

Statistical Analysis

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# Data Overview



	passenger_count	trip_distance	payment_type	fare_amount	duration
0	1	3.70	Card	24.0	27.950000
1	1	2.77	Card	18.4	19.200000
2	1	3.30	Card	22.6	27.383333
3	1	0.30	Cash	5.1	2.550000
4	1	0.83	Card	7.2	5.250000



# *Problem Statements*

1. Is the choice of payment method (cash, credit card) independent of trip distance category (short, medium, long)?
2. check whether fare amount differs significantly depending on how many passengers are in the taxi
3. Do short trips generate higher fares per km than long trips?

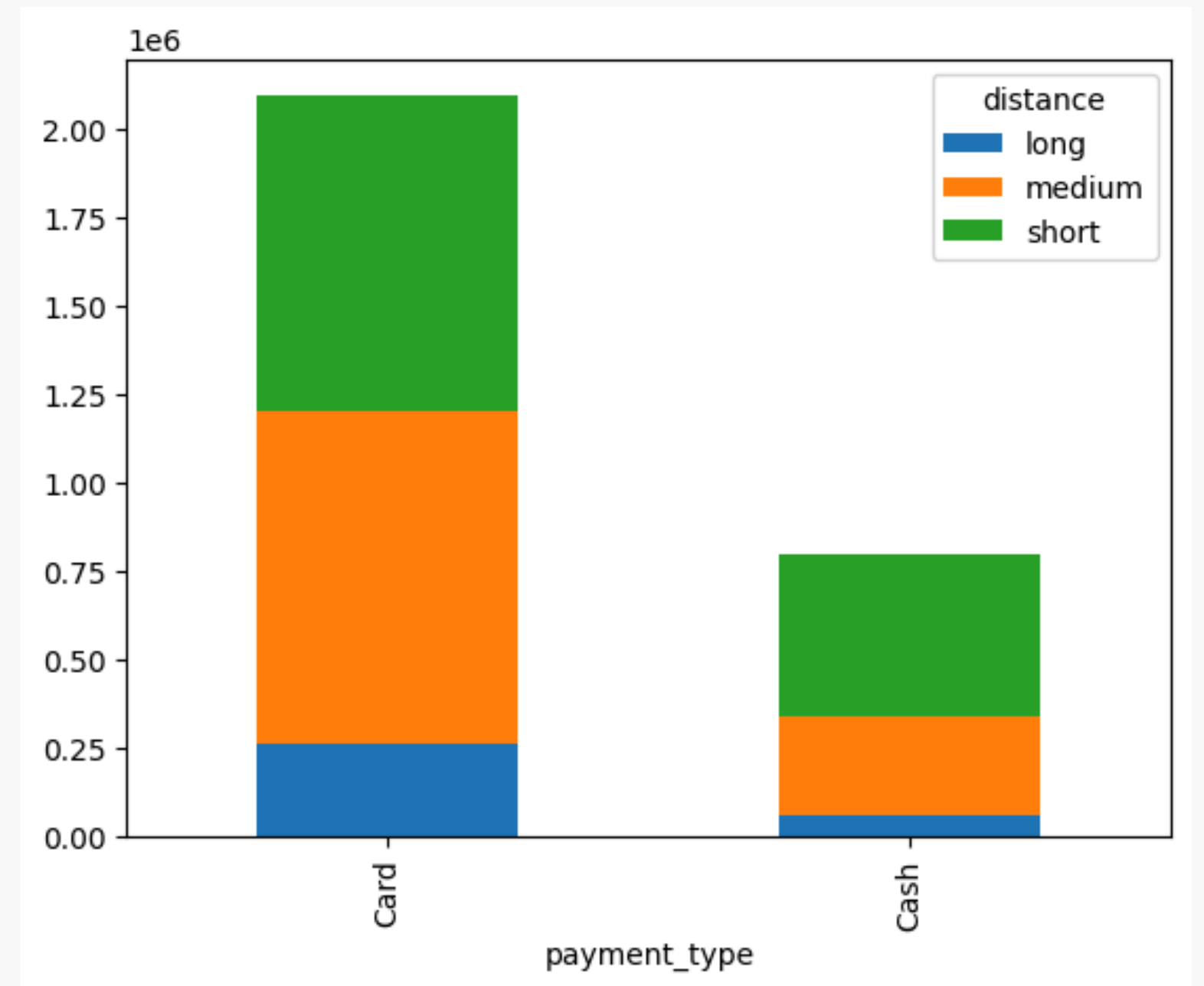


# 1. *Payment Type vs Trip Distance*

Null Hypothesis ( $H_0$ ): Payment type is independent of trip distance.

Alternative Hypothesis ( $H_1$ ): Payment type is dependent on trip distance (i.e., choice of payment may vary with trip distance).

With chi-square test statistic for independence 52479.3 and  $p < 0.05$  (significance level), we reject  $H_0$  suggesting that Payment type and trip distance are NOT independent



# *Business Insights*

- The choice of payment type depends on how long the trip is.
- Short trips → more cash payments (since fares are small, passengers often pay cash).
- Long trips → more card payments (since higher fares, passengers prefer digital/card).

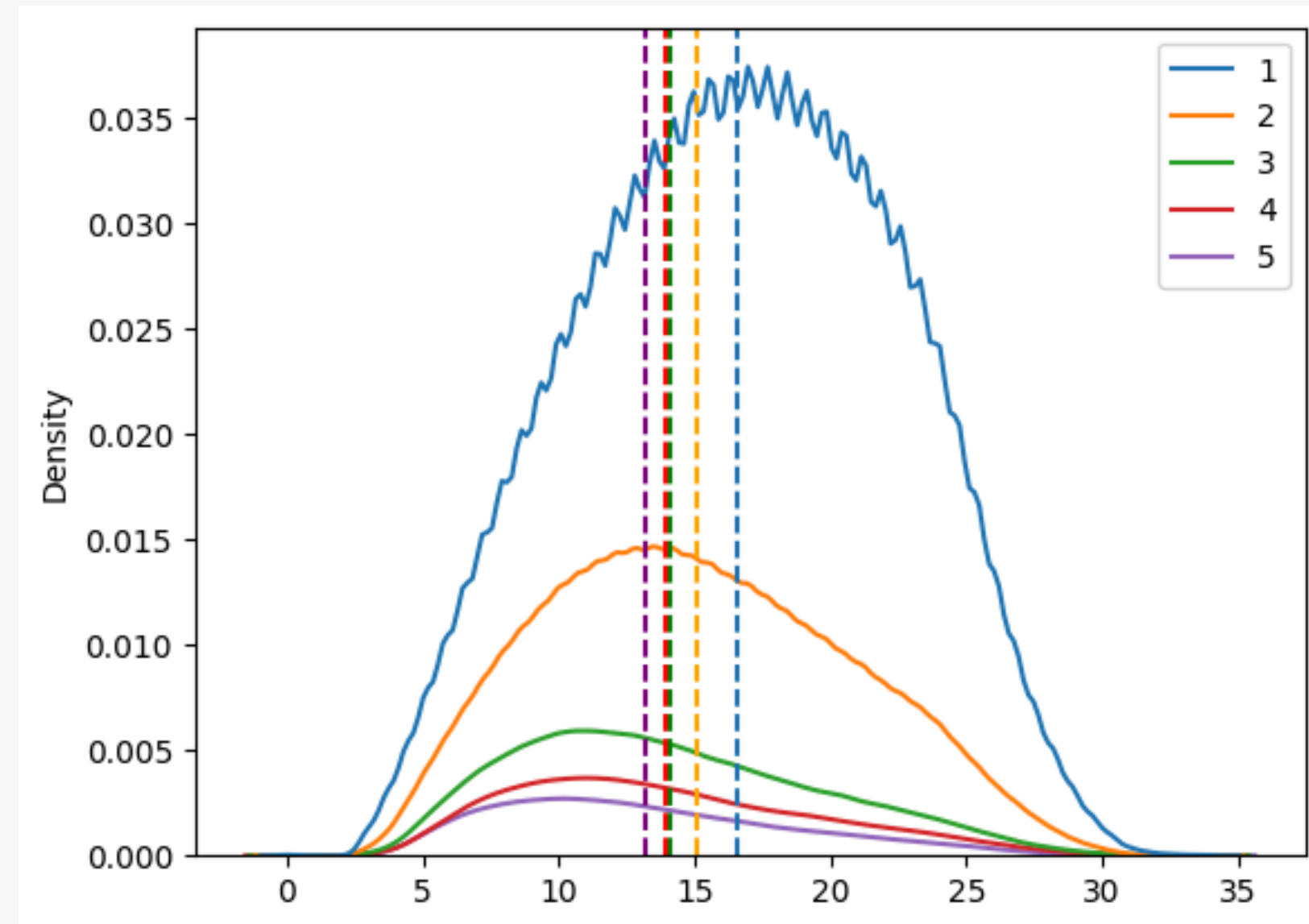


## 2. *Does passenger count affect fare amount?*

Null Hypothesis ( $H_0$ ): Average fare amount is the same for all passenger counts.

Alternative Hypothesis ( $H_1$ ): Average fare amount is the same for all passenger counts.

With Kruskal-Wallis test statistic 105792.2 and  $p < 0.05$  (significance level), we reject  $H_0$  suggesting that Passenger count has a significant effect on fare amount



# *Business Insights*

- Passenger count influences fare amount significantly.
- Solo rides are the core business: The bulk of fares (most dense, consistent) come from 1-passenger trips.
- Multi-passenger trips bring higher revenue: Even though less frequent, fares for 3–5 passengers are typically higher



### *3. Do short trips generate higher fares per km than long trips?*

Null Hypothesis ( $H_0$ ): Short trips and long trips have the same average fare per km.

Alternative Hypothesis ( $H_1$ ): Short trips and long trips do not have same average fare per km

With mann-whitney u test statistic whose  $p < 0.05$  (significance level), we reject  $H_0$  suggesting that Short trips and long trips do not have same average fare per km





# *Business Insights*

- short trips indeed have higher fare per km.
- Base fare & fixed charges – Every trip starts with a flat booking fee or base fare. For short distances, this fixed cost makes up a large portion of the total, pushing up the per-km rate.
- Minimum fare policy – Many taxi/ride companies enforce a minimum fare (e.g., ₹100 minimum). Even if the trip is very short, the passenger pays this minimum, making per-km cost higher than for long trips.





*Thank you*

