

# Analysis and Recommendations for Upfront Pricing Precision for a Ride-hailing service.

## Objective:

Through this analysis we aim to improve upfront pricing precision for a ride-hailing service. Specifically, we aim to identify the factors contributing to pricing deviations greater than 20% between the upfront and metered prices and generate business insights that will help in optimizing the pricing model to reduce customer dissatisfaction and improve accuracy.

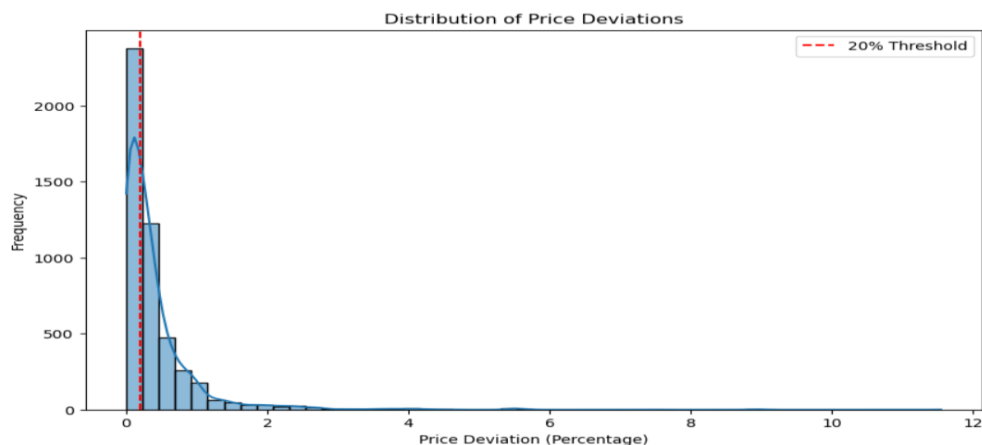
This document covers the technical analysis done to identify key factors affecting the deviations as well as recommended actions to be taken from a business point of view. Please find the python code of the analysis and the cleaned data set used [here](#).

**1. Correlation Analysis:** We analyzed key variables like “predicted duration”, “predicted distance”, and the “us\_indicator” (that indicates whether the ride was taken in US or not) from the given dataset, which directly impact upfront pricing. Here's a summary of key correlations:

- **Predicted Duration:** Correlation of **0.75** with upfront price.
- **Predicted Distance:** Correlation of **0.71** with upfront price.
- **Metered Price:** Moderate correlation of **0.42** with upfront price.
- **Us\_indicator:** Negative correlation of **-0.41** with upfront price, indicating a regional impact on pricing.

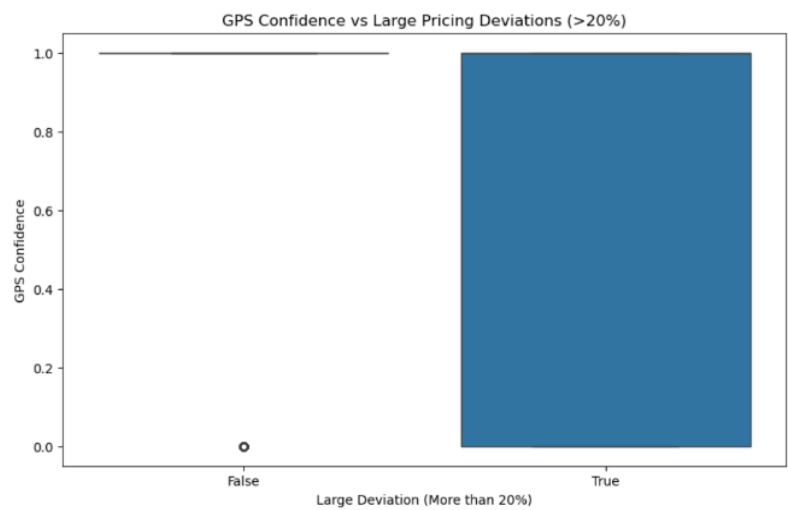
These are the strongest predictors of upfront price, and the pricing model can be improved by focusing on accurate predictions for duration and distance by utilizing and tweaking these factors.

**2. Price Deviation Analysis:** The analysis showed that the majority of the rides exhibited a less than 20% deviation with a smaller group of outliers that showed a greater deviation (>20%) from the original estimate. This indicates that the current pricing model works well for most rides, but outliers need to be addressed. It is important, thus, to address the factors affecting these deviations.



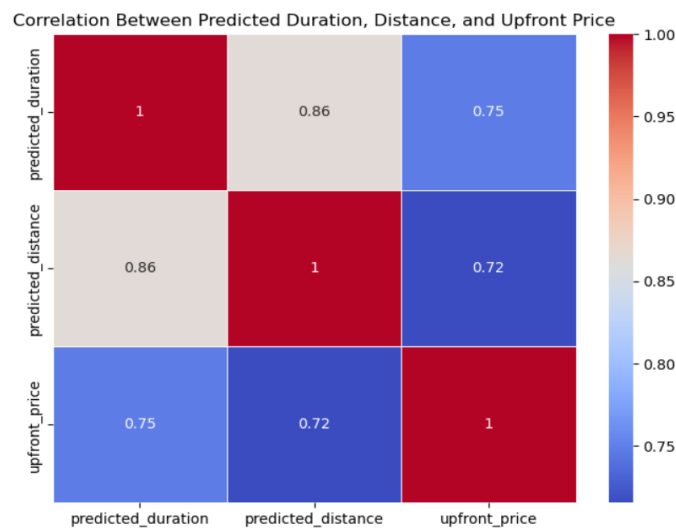
Key Factors Impacting Price Deviations:

- 1. **GPS Confidence and Price Deviations:** Even rides with high GPS confidence exhibit significant pricing deviations. This suggests that while GPS accuracy is high, the model may not account for external factors like traffic or unexpected route changes.



**Recommendation:** We must aim to improve traffic prediction and route adjustment capabilities to ensure that high GPS confidence leads to better pricing accuracy.

- 2. **Predicted Duration and Distance:** These two variables are the **strongest drivers of upfront pricing**. When predicted duration and distance are inaccurate, price deviations tend to occur more frequently.



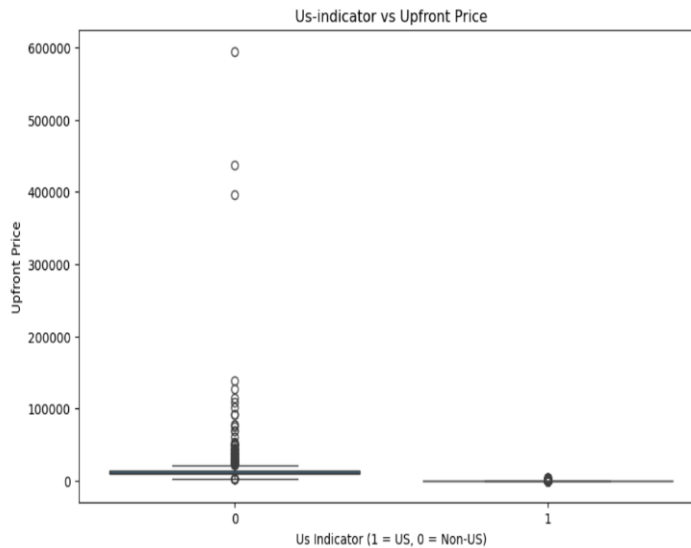
**Recommendation:** Focus on improving prediction models for duration and distance by integrating real-time traffic data to better account for dynamic factors, particularly during peak hours.

- 3. **Destination Changes:** Rides with multiple destination changes are slightly more prone to large deviations. Although destination changes don't have a strong correlation with deviations, significant route modifications should be better accounted for.

**Recommendation:** Implement dynamic price recalculations taking external factors into account when there are major destination changes mid-ride.

- 4. **Us\_indicator and Pricing:** **Us\_indicator** has a negative correlation with upfront price, indicating that rides in the US are priced differently than those outside the US. **However**, it does not affect large deviations significantly. This suggests that while location does

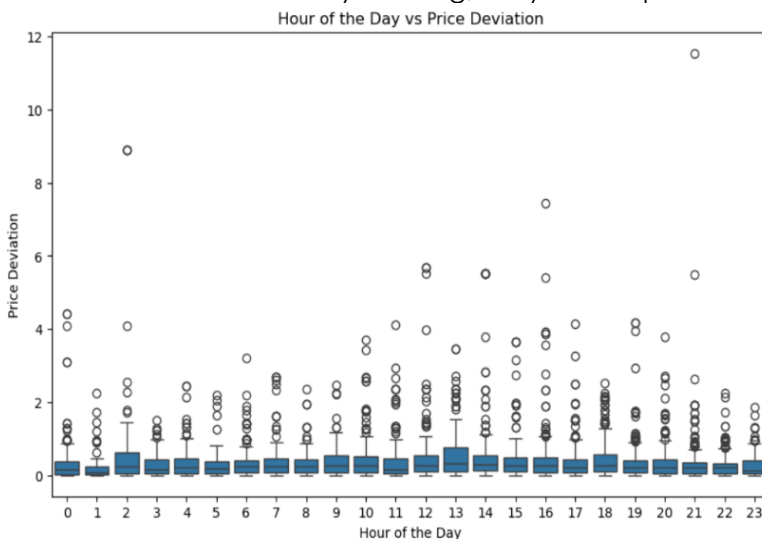
matter for initial pricing, other factors (such as duration, distance, and route changes) drive deviations.



**Recommendation:**

Ensure region-specific pricing models are refined, but prioritize fixing factors like time and distance predictions to prevent large deviations.

**3. Hour of the Day Analysis:** The hour of the day can affect price deviations due to changes in traffic, ride demand, and travel patterns. The analysis shows a slight increase in deviations during the late afternoon and early evening, likely due to peak traffic hours.



**Recommendation:** The pricing model should consider these time-based variations, significantly during high-demand periods when traffic can cause unexpected delays or route changes.

## 4. Key Insights

**A. Fine tune Duration and Distance Predictions:** Duration and distance are the factors that are most influencing upfront price. Large deviations are more likely when these predictions are inaccurate.

**Recommendation:** Refine models for predicting duration and distance by incorporating real-time traffic data, historical ride data, and common route changes. This will ensure more accurate pricing upfront.

**B. Address High GPS Confidence Anomalies:** Rides with high GPS confidence still see large deviations in price. This suggests that while the GPS model is strong, the route dynamics (e.g., traffic or detours) may not be properly accounted for.

**Recommendation:** Incorporate sophisticated traffic prediction models and route adjustment algorithms to improve pricing precision.

**C. Limit the Impact of Destination Changes:** Rides with multiple destination changes show higher deviations. Although destination changes don't show a high overall correlation, significant changes to the route should be reflected in the price.

**Recommendation:** Implement dynamic recalculations of upfront prices when major destination changes occur. This will prevent unexpected pricing changes for both customers and the company.

**D. Regional Pricing Adjustments (Us Indicator):** The **us\_indicator** affects upfront pricing (negative correlation with upfront price), but does not significantly affect large deviations. This shows that regional pricing models work well, but location-specific factors don't drive deviations.

**Recommendation:** Refine regional pricing models, especially for US vs. non-US rides.

#### 4. Final Recommendations

1. **Enhance Time and Distance Prediction Models:** Work on the accuracy of predicted duration and distance (the strongest predictors of upfront pricing). Account for real-time traffic data and historical trends for more accurate pricing.
2. **Improve Real-time Route Adjustments:** Build up the GPS and traffic prediction systems, ensuring that high GPS confidence leads to accurate pricing. Consider dynamic adjustments based on traffic, route changes, and destination modifications.
3. **Dynamic Pricing Adjustments for Route Changes:** Adjust prices dynamically during the ride when there are major route or destination changes, ensuring that upfront prices reflect real-time ride conditions.
4. **Region-Specific Pricing Models:** Focus on improving regional pricing models to better account for market-specific dynamics, but prioritize improving predictive accuracy for duration and distance to minimize deviations.

#### 5. Conclusion

The key factors influencing upfront pricing precision are predicted duration, distance, and the ability to dynamically adjust for route changes and real-time traffic conditions. Improving these aspects of the pricing model will reduce the occurrence of large deviations and enhance the overall customer experience. Implementing region-specific pricing adjustments (based on the **us\_indicator**) will further optimize the system for different markets.