

ELIZABETH FRANK

CARS4U

USED CAR
PREDICTION MODEL





AGENDA

PRIMARY OBJECTIVE

DATA EXPLORATION

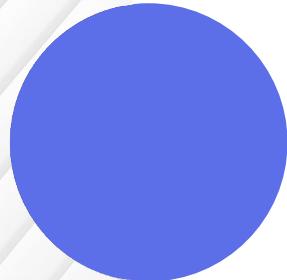
MODEL SELECTION

RECOMMENDATIONS

A bright new tech company entering the
the Indian used car retail market.

PRIMARY OBJECTIVE

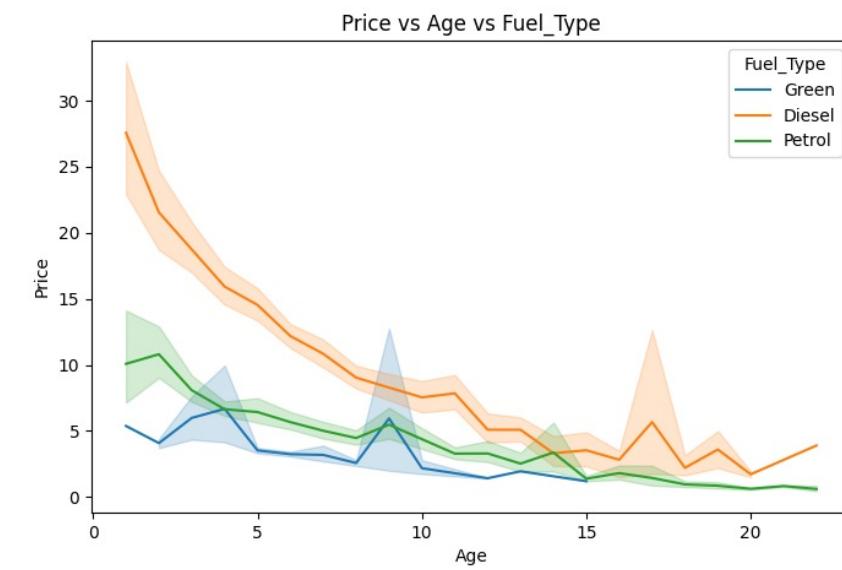
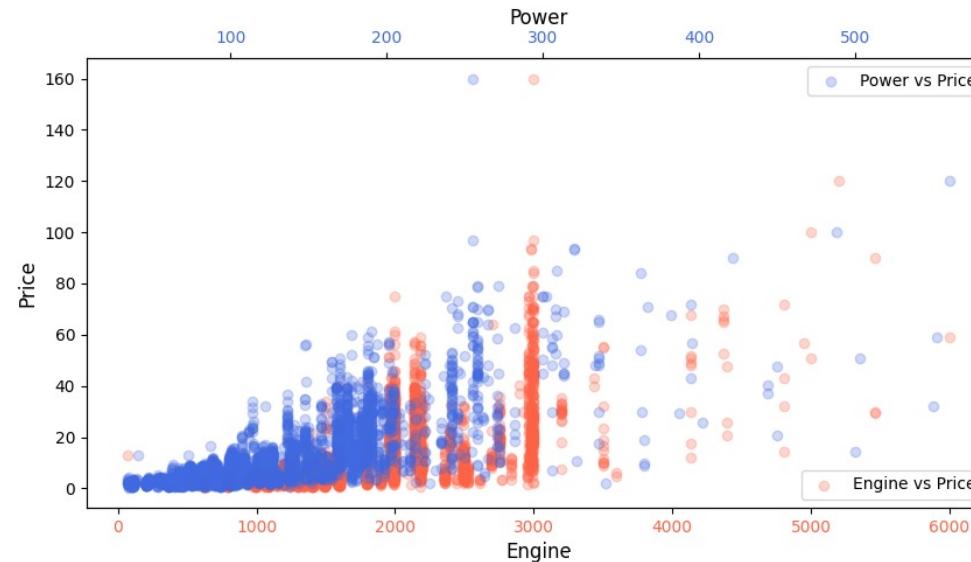
Used car price prediction



Generate insight from data
exploration and build an effective
predictive model.

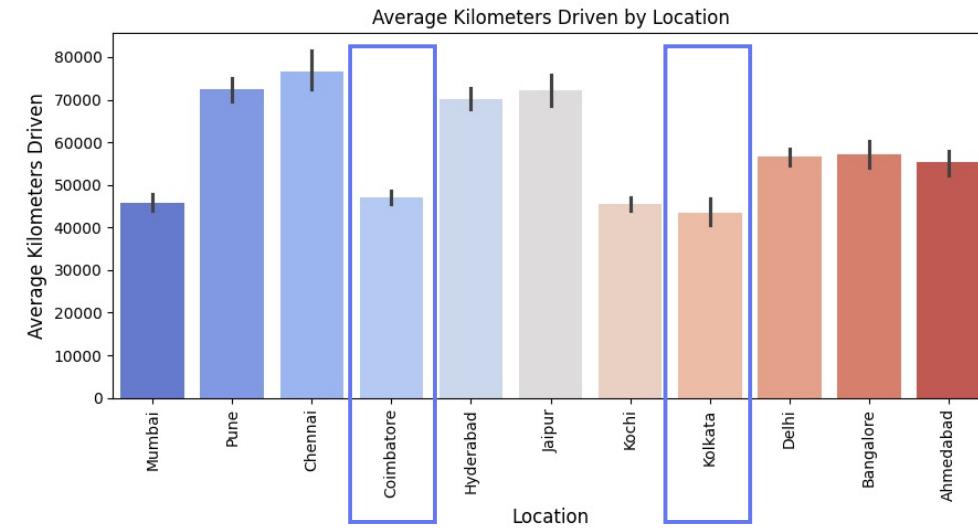
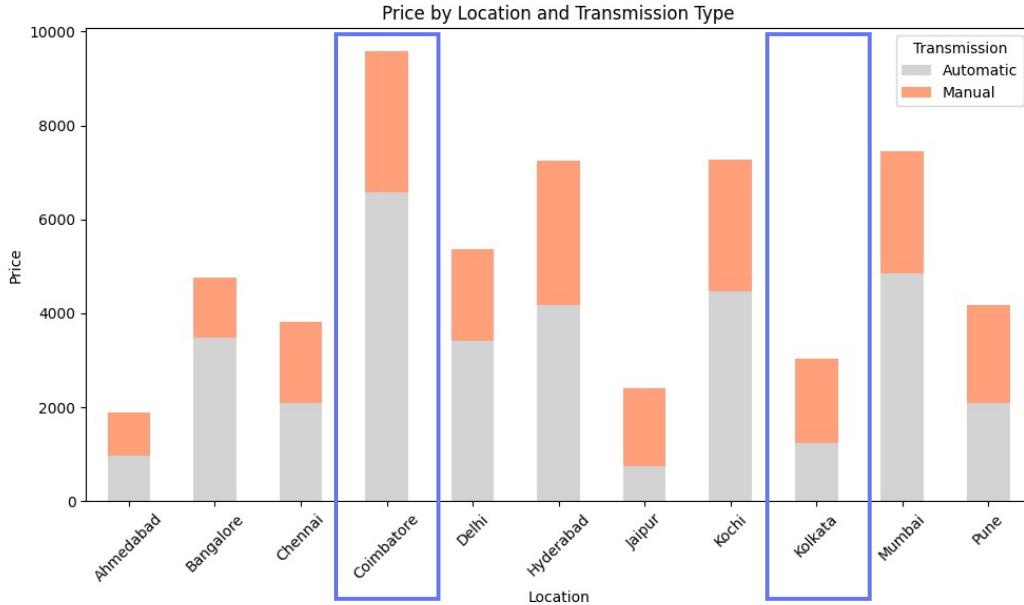
OUR DATA

- Name
- Location
- Year
- Kilometers Driven
- Fuel Type
- Transmission
- Owner Type
- Mileage
- Engine
- Power
- Seats
- New Price
- Price (Dependent)



OUR MARKET

- Mumbai (13%)
- Hyderabad
- Coimbatore (11%)
- Kochi
- Pune
- Delhi
- Kolkata (9%)
- Chennai
- Jaipur
- Bangalore
- Ahmedabad (4%)



DATA PREP



- Handling Missing Values
- Outlier Detection and Treatment
- Variable transformation
- Feature Selection
- Encoding Categorical Variables

MODEL SELECTION

Linear

OLS (Ordinary Least Squares)

Linear Regression

-Feature Selection

Regularized

Ridge Regression

-Optimized α

Lasso Regression

-Optimized α

Elastic Net

-Optimized α

Decision Tree

DT (Decision Tree)

-Hyperparameter Tuning

Ensemble

Bagging

RF (Random Forest)

-Hyperparameter Tuning

AdaBoost

Gradient Boost

-Hyperparameter Tuning

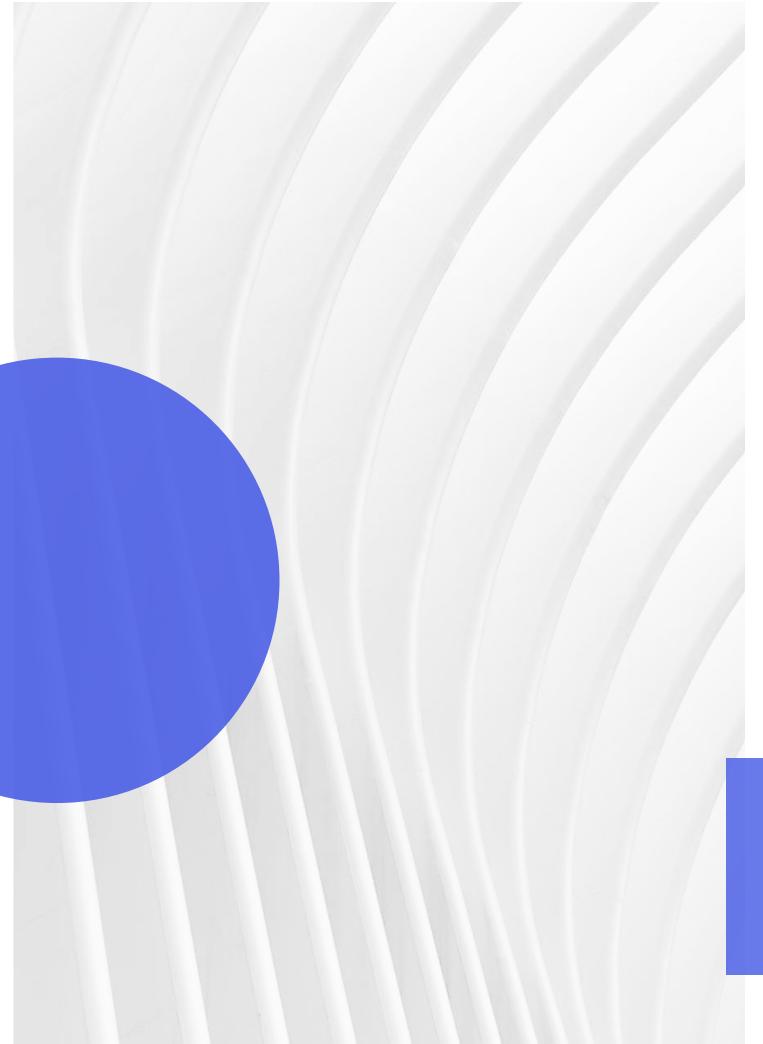
XGBoost

MODEL SELECTION

	Training Data		Test Data	
	R ²	RMSE	R ²	RMSE
Linear Regression	0.92	4.29	0.92	3.83
Gradient Boosting	0.94	3.29	0.93	4.23
Gradient Boosting Tuned	0.97	2.01	0.94	3.59

FEATURE IMPORTANCE

- POWER
- AGE
- PETROL
- MANUAL
- MILEAGE
- KILOMETERS DRIVEN

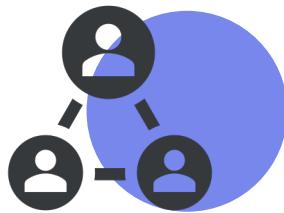


RECOMMENDATIONS



ACTIONABLE INSIGHTS

- Higher power vehicles with lower age yield the highest prices.
- Diesel fueled vehicles sell at an increased price.
- Manual transmission lowers the price of the vehicle.
- Lower mileage reported (KPL) does not constitute higher prices.
- Increased kilometers driven reduces price



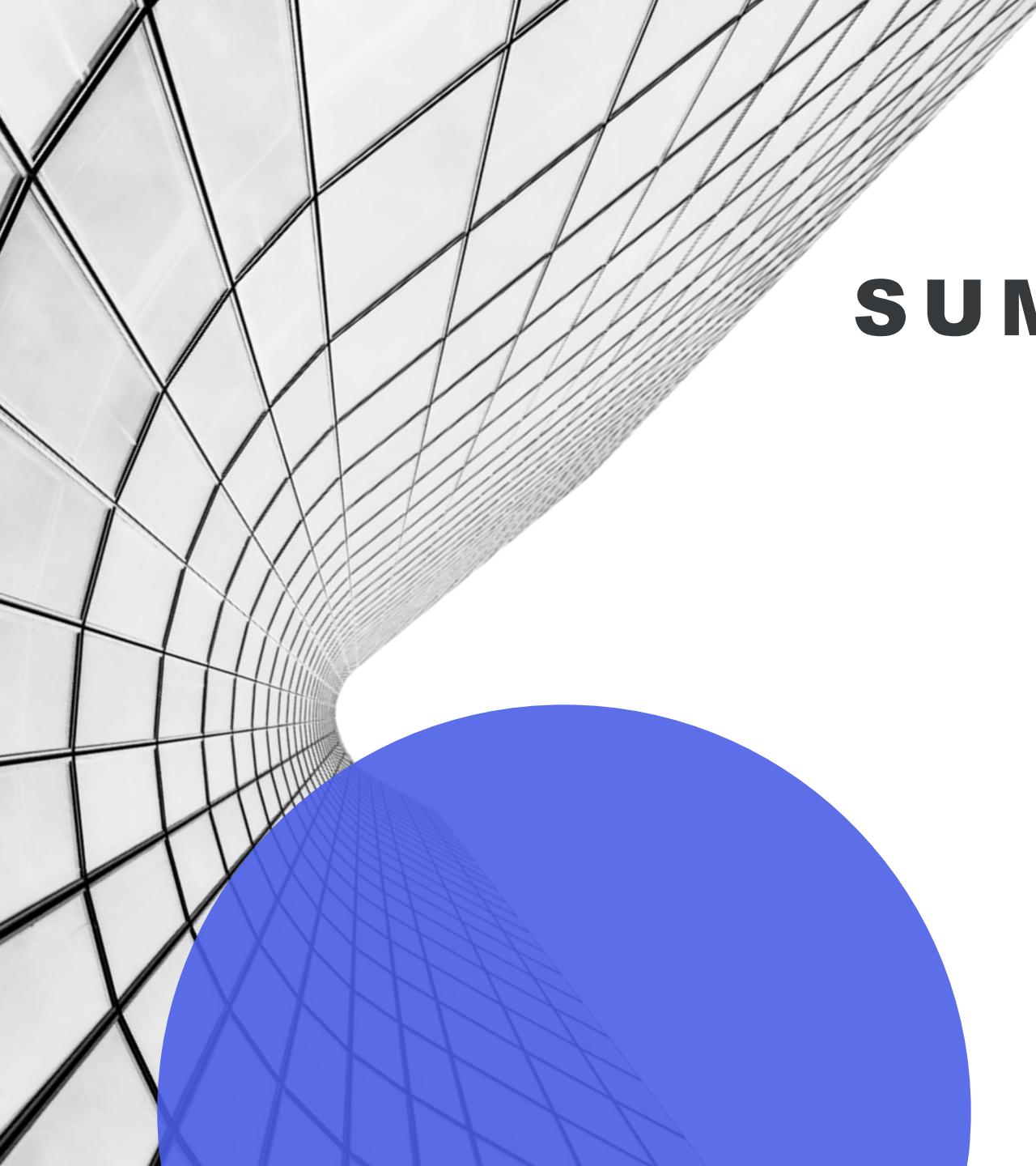
DIFFERENTIAL PRICING MARKETS

- Kolkata
 - Lowest average prices, age, and kilometers driven vehicles
- Coimbatore
 - Highest priced vehicles, low age and kilometer driven inventory.



MODEL DEPLOYMENT

- Use predictive modeling to determine undervalued vehicles with desirable features, focusing on Kolkata for its history of low pricing.
- Utilize model for accurately pricing vehicles for resale in premium markets, like Coimbatore.



SUMMARY

Establishing a system that enhances profit stability in a fluctuating market can lead to greater inventory capacity, the foundation for a thriving used car business like Cars4U.

THANK YOU

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MIT Applied Data Science Program Capstone Full Code