**Project -4 Report: Toyota Corolla Price Prediction**

**1. Objective**

To build a regression model that predicts the resale price of Toyota Corolla cars based on various features like mileage, engine size, fuel type, etc.

**2. Solution Architecture**

* **Data Source:** CSV Dataset of Toyota Corolla resale data
* **Tools Used:** Python, Pandas, Seaborn, Scikit-learn, Jupyter Notebook
* **Architecture Flow:**  
  → Data Collection  
  → Preprocessing (cleaning, null handling)  
  → EDA (Visualization, correlation)  
  → Model Building (Linear Regression)  
  → Evaluation  
  → Deployment (optional)

**3. Methodology**

1. Import and inspect the dataset
2. Handle missing values and remove outliers
3. Perform exploratory data analysis (EDA)
4. Select relevant features based on correlation
5. Build multiple linear regression models
6. Evaluate using R², Adjusted R²
7. Optimize and finalize the best-fit model

**4. Time Taken**

**2 Days**

* Day 1: EDA + Preprocessing + Initial Modeling
* Day 2: Model Selection + Evaluation + Documentation

**5. Challenges Faced**

* Multicollinearity among features
* Missing or inconsistent values in some fields
* Feature scaling and transformation
* Choosing the best predictor combination for higher accuracy

**6. Complexity**

**Moderate**

* Required understanding of regression techniques
* Some technical skill needed for data cleaning and visualization
* Interpreting model metrics and adjusting for accuracy

**7. Business Impact**

* Data-driven pricing decisions for resale vehicles
* Better negotiation leverage for both dealers and customers
* Improves customer trust with transparent, predictable pricing models