

Project Design Phase-I
Solution Architecture

Date	20 October 2023
Team ID	EXT2023TMID591615
Project Name	Car Purchase Prediction Model
Maximum Marks	4 Marks

Solution Architecture:

1. Data Collection:

- Collect or create the dataset containing customer demographics and historical purchase patterns.

2. Data Visualization and Analysis:

- Perform univariate, bivariate, and multivariate analysis for insights into the dataset.
- Conduct descriptive analysis to understand data distributions.

3. Data Pre-processing:

- Check for null values and handle them appropriately.
- Address outliers using suitable techniques.
- Handle categorical data through encoding methods.
- Split the data into training and testing sets for model development.

4. Model Building:

- Import necessary libraries for Decision Tree Classifier and SVM Classifier.
- Initialize both classifiers and train them using the pre-processed data.
- Evaluate model performance using appropriate metrics (e.g., accuracy, F1-score).
- Save the trained models for future use.

5. Application Building:

- Create an HTML file for the user interface.
- Develop Python code to integrate the trained models into the HTML interface.
- Allow users to input data, process predictions using the models, and display purchase likelihood results.

6. Deployment and Integration:

- Deploy the application on a web server.
- Integrate the application with the backend system housing the trained models.
- Ensure seamless communication between the frontend (HTML interface) and the backend (Python code and machine learning models).

7. User Interaction:

- Users input their demographics via the HTML interface.
- Python code processes the input using the trained Decision Tree Classifier and SVM Classifier.
- Display the purchase likelihood results back to the users via the HTML interface.

8. Monitoring and Maintenance:

- Implement monitoring tools to track user interactions and system performance.
- Conduct regular maintenance to update the models with new data and enhance prediction accuracy.
- This solution architecture outlines a streamlined process from data collection and analysis to model building, application development, and deployment. The Decision Tree Classifier and SVM Classifier are key components in the machine learning model building phase, integrated into a user-friendly web application for predicting car purchases.

Solution Architecture Diagram

