# Model Development Phase Template

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| Date | 10 July 2024 |
| Team ID | 739652 |
| Project Title | Trip-Based Modelling of Fuel Consumption in Modern Fleet Vehicles Using Machine Learning |
| Maximum Marks | 6 Marks |

**Model Selection Report**

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

**Model Selection Report:**

| Model | Description | Hyperparameters | Performance Metric (e.g., Accuracy) |
|---|---|---|---|
| Linear Regression | Linear regression is a statistical method used to model the relationship between a dependent variable and one or more independent variables . The goal of linear regression is to find the best-fitting line that describes how the dependent variable changes as the independent variables change. | No hyperparameters used | Accuracy: 0.11347 11.347 |
| Lasso Regression | Least Absolute Shrinkage and Selection Operator is a linear regression technique that performs variable selection and regularization simultaneously by adding an L1 penalty to the loss function. This penalty encourages the model to shrink some coefficients to exactly zero, which helps in preventing overfitting | No hyperparameters used | Accuracy: 0.14561 14.561 |

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| SVM | Support Vector Machine is a supervised machine learning algorithm used for classification and regression tasks. It works by finding the hyperplane that best separates the data into different classes with the maximum margin, ensuring robust generalization to new data. It can also handle non-linear boundaries through the use of kernel functions. | No hyperparameters used | Accuracy: 0.41764<br>41.764 |
| Decision Tree | A decision tree is a supervised machine learning algorithm used for classification and regression. It splits data into subsets based on input features, forming a tree-like structure of decision and leaf nodes for predictions. Decision trees are intuitive but can overfit without pruning. | No hyperparameters used | Accuracy: 0.98645<br>98.645 |
| Random Forest | A random forest is an ensemble learning method that combines multiple decision trees to improve accuracy and prevent overfitting. It works by averaging the predictions of individual trees, which are trained on random subsets of the data and features, to produce a more robust and generalized model. | No hyperparameters used | Accuracy: 0.93546<br>93.546 |