**Model Development Phase Template**

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| Date | 15 March 2024 |
| Team ID | SWTID1720019244 |
| Project Title | Traffictelligence: Advanced Traffic Volume Estimation with 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:**

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| **Model** | **Description** | **Hyperparameters** | **Performance Metrics** |
| Random Forest | Ensemble of decision trees; captures complex relationships in traffic data, reduces overfitting, and provides feature importance for traffic volume prediction. | Number of trees, Maximum depth of trees, Minimum samples per split | Mean Squared Error (MSE) or R-Squared |
| Decision Tree | Simple tree structure; interpretable, captures non-linear relationships between traffic features and volume, useful for initial insights. | Maximum depth of tree, Minimum samples per split | MSE or R-Squared |
| SVR | Classifies traffic volume based on similar historical data points, effective for capturing local variations in traffic patterns. | Number of neighbors, Distance metric | MSE or R-Squared |
| Gradient Boosting | Sequential ensemble method using decision trees; optimizes prediction accuracy for traffic volume, handles complex relationships in traffic data. | Number of trees (estimators), Learning rate , Maximum depth of trees | MSE or R-Squared |
| Linear Regression | Identifies linear relationships between traffic features and volume; interpretable, provides insights into feature impact, suitable for baseline model. | Regularization parameters | MSE or R-Squared |