Data Preparation:

The dataset contains information about multiple junctions, including features like year, month, date, hour, and day of the week.

The 'Vehicles' column is the target variable, representing the number of vehicles at each junction.

Linear Regression:

Linear regression is used to model the relationship between the features and the number of vehicles.

The code includes functions for training a linear regression model (train\_linear\_regression) and making predictions (predict\_linear\_regression).

Junction-Specific Analysis:

The code uses a loop to iterate over different junctions (junctions 1 to 3).

For each junction, the data is split into training and test sets, and features are selected, including one-hot encoded day columns.

Scaling Features:

Features are scaled using StandardScaler to standardize the data.

Model Training and Evaluation:

The linear regression model is trained on the scaled training data, and predictions are made on the test data.

Mean Squared Error (MSE) is calculated as an evaluation metric.

Visualization:

The true values and predicted values are plotted over time for each junction, allowing for a visual assessment of the model's performance.

In summary, this project aims to build and evaluate linear regression models to predict the number of vehicles at different junctions. The inclusion of features such as time-related variables (year, month, date, hour, day of the week) suggests a time-series regression analysis, where the goal is to capture patterns and trends in the data to make accurate predictionsTop of Form

What is Linear Regression?

Linear regression is a type of [supervised machine learning](https://www.geeksforgeeks.org/supervised-machine-learning/) algorithm that computes the linear relationship between a dependent variable and one or more independent features. When the number of the independent feature, is 1 then it is known as Univariate Linear regression, and in the case of more than one feature, it is known as multivariate linear regression.

Why Linear Regression is Important?

The interpretability of linear regression is a notable strength. The model’s equation provides clear coefficients that elucidate the impact of each independent variable on the dependent variable, facilitating a deeper understanding of the underlying dynamics.