ADAGRAD REGRESSION

This code implements an **Adagrad Regression** model to predict the length of a product based on its type. Here are the details of the code:

- First, the required libraries are imported, including Pandas, NumPy, and Scikit-Learn.

- Next, the AdagradRegression class is defined. This class has methods for training the model and making predictions. The fit method trains the model using Adagrad optimization, which is a gradient descent algorithm that adapts the learning rate based on the history of gradients. The predict method makes predictions using the trained model.

- The code then loads the training and test data from CSV files.The features and target variables are selected from the data.

- An instance of the AdagradRegression class is created with a learning rate of 0.01 and an epsilon value of 1e-8.The Adagrad Regression model is trained using the fit method.

- Predictions are made on the test data using the predict method.The mean absolute percentage error (MAPE) between the predicted and actual target variables is calculated.

- The MAPE score is printed to the console.A submission file is created in CSV format with the predicted target variables.

In terms of feature engineering, only the PRODUCT_TYPE_ID feature is used in this model. No additional preprocessing or feature engineering is performed. The Scikit-Learn StandardScaler is used to standardize the features and target variables before training and making predictions.