Training Day-5 Report:

Types of Regression Techniques

Linear Regression

Linear regression is used for predictive analysis is a linear approach for modeling the relationship between the criterion or the scalar response and the multiple predictors or explanatory variables. Linear regression focuses on the conditional probability distribution of the response given the values of the predictors. The formula for linear regression is:

Syntax:

y = θx + b

where,

- ***θ*** *– It is the model weights or parameters*
- ***b*** *– It is* known *as the bias.*

This is the most basic form of regression analysis and is used to model a linear relationship between a single dependent variable and one or more independent variables.

Here, a linear regression model is instantiated to fit a linear relationship between input features (X) and target values (y). This code is used for simple demonstration of the approach.

Example:

```
from sklearn.linear_model import LinearRegression
model = LinearRegression()
model.fit(X, y)
y_pred = model.predict(X_new)
```

Polynomial Regression

This is an extension of linear regression and is used to model a non-linear relationship between the dependent variable and independent variables. Here as well syntax remains the same but now in the input variables we include some polynomial or higher degree terms of some already existing features as well. Linear regression was only able to fit a linear model to the data at hand we can easily fit some non-linear relationship between the target as well as input features.

Here is the code for simple demonstration of the Polynomial regression approach.

Example:

```
from sklearn.linear_model import PolynomialRegression
model = PolynomialRegression(degree=2)
```

```
# Fit the model to the data
model.fit(X, y)

# Predict the response for a new data point
y_pred = model.predict(X_new)
```