

Training Day-4 Report:

Regression in machine learning

Regression, a statistical approach, dissects the relationship between dependent and independent variables, enabling predictions through various regression models. The article delves into regression in machine learning, elucidating models, terminologies, types, and practical applications.

What is Regression?

Regression is a statistical approach used to analyze the relationship between a dependent variable (target variable) and one or more independent variables (predictor variables). The objective is to determine the most suitable function that characterizes the connection between these variables.

It seeks to find the best-fitting model, which can be utilized to make predictions or draw conclusions.

Regression in Machine Learning

It is a supervised machine learning technique, used to predict the value of the dependent variable for new, unseen data. It models the relationship between the input features and the target variable, allowing for the estimation or prediction of numerical values.

Regression analysis problem works with if output variable is a real or continuous value, such as “salary” or “weight”. Many different models can be used, the simplest is the linear regression. It tries to fit data with the best hyper-plane which goes through the points.

Example:

```
import matplotlib
matplotlib.use('GTKAgg')

import matplotlib.pyplot as plt
import numpy as np
from sklearn import datasets, linear_model
import pandas as pd

df = pd.read_csv("Housing.csv")

Y = df['price']
X = df['lotsize']

X=X.values.reshape(len(X),1)
Y=Y.values.reshape(len(Y),1)
X_train = X[:-250]
X_test = X[-250:]

Y_train = Y[:-250]
X_test = X[-250:]

Y_train = Y[:-250]
Y_test = Y[-250:]
```

```
# Plot outputs
plt.scatter(X_test, Y_test, color='black')
plt.title('Test Data')
plt.xlabel('Size')
plt.ylabel('Price')
plt.xticks(())
plt.yticks(())

regr = linear_model.LinearRegression()

# Train the model using the training sets
regr.fit(X_train, Y_train)
plt.plot(X_test, regr.predict(X_test), color='red',linewidth=3)
plt.show()
```

