



Experiment: 2.2

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Branch: CSE

Semester: 5th

Subject Name: AIML Lab

UID: 21BCS-3155

Section/Group: 21BCS-IOT-602B

Date: 28/09/23

Subject Code: 21CSH-316

1. AIM: Implementing Linear Regression and Logistic Regression models

2. Objective:

- To learn about different functions.
- To learn About Different Linear Regression Techniques.
- To Learn about Linear Regression Model or algorithms.

3. Tools/Resource Used:

1. Python programming language.
2. Jupyter Notebook.

4. Description:

Problem Statement:

The growth of supermarkets in most populated cities is increasing and market competitions are also high. The dataset is one of the historical sales of Supermarket Company which has recorded in 3 different branches for 3 months data. Predictive data analytics methods are easy to apply with this dataset.

5. Program Code:

```
import matplotlib.pyplot as plt
import numpy as np
from sklearn import datasets, linear_model
from sklearn.metrics import mean_squared_error, r2_score

# Load the diabetes dataset
diabetes = datasets.load_diabetes()
```



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```
diabetes_X = diabetes.data[:, np.newaxis, 2]
```

Split the data into training/testing sets

```
diabetes_X_train = diabetes_X[:-20]
```

```
diabetes_X_test = diabetes_X[-20:]
```

Split the targets into training/testing sets

```
diabetes_y_train = diabetes.target[:-20]
```

```
diabetes_y_test = diabetes.target[-20:]
```

Create linear regression object

```
regr = linear_model.LinearRegression()
```

Train the model using the training sets

```
regr.fit(diabetes_X_train, diabetes_y_train)
```

Make predictions using the testing set

```
diabetes_y_pred = regr.predict(diabetes_X_test)
```

The coefficients

```
print('Coefficients: \n', regr.coef_)
```

The mean squared error

```
print("Mean squared error: %.2f" % mean_squared_error(diabetes_y_test, diabetes_y_pred))
```

Explained variance score: 1 is a perfect prediction

```
print('Variance score: %.2f' % r2_score(diabetes_y_test, diabetes_y_pred))
```

Plot outputs

```
plt.scatter(diabetes_X_test, diabetes_y_test, color='black')
```

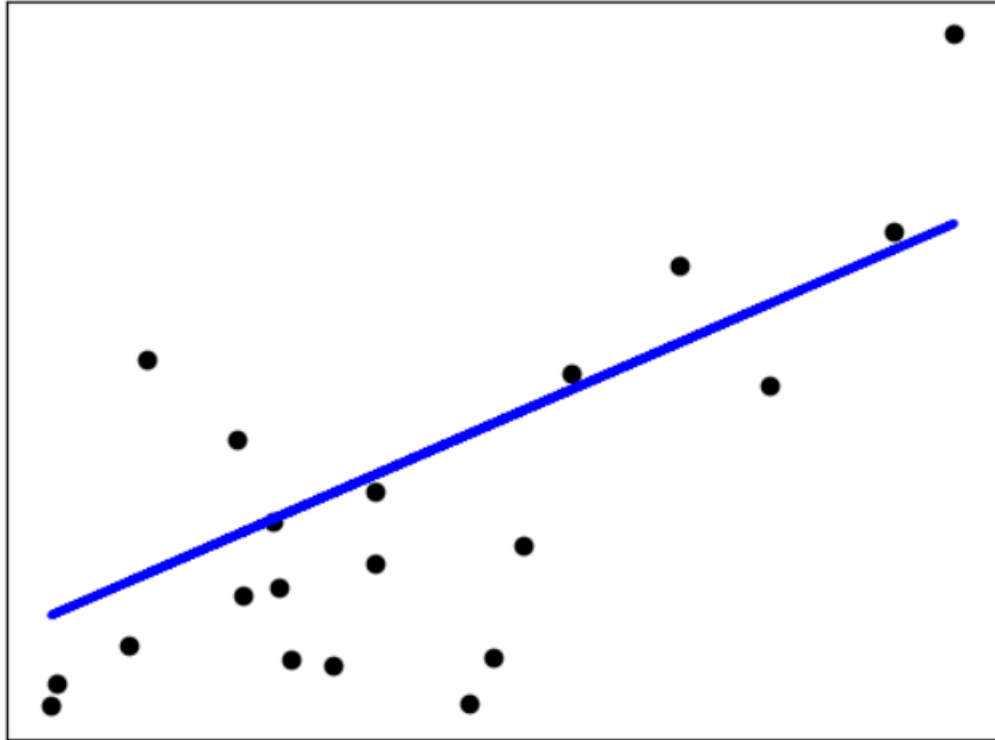
```
plt.plot(diabetes_X_test, diabetes_y_pred, color='blue', linewidth=3)
```

```
plt.xticks()
```

```
plt.yticks()
```

```
plt.show()
```

6. Output/Result:



Coefficients:
[938.23786125]
Mean squared error: 2548.07
Variance score: 0.47

7. Learning Outcomes:

1. Implement to implement different python library.
2. Understand the concept of numpy, pandas, SciPy library.
3. Understand the concept of linear regression