Experiment: 2.2

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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:

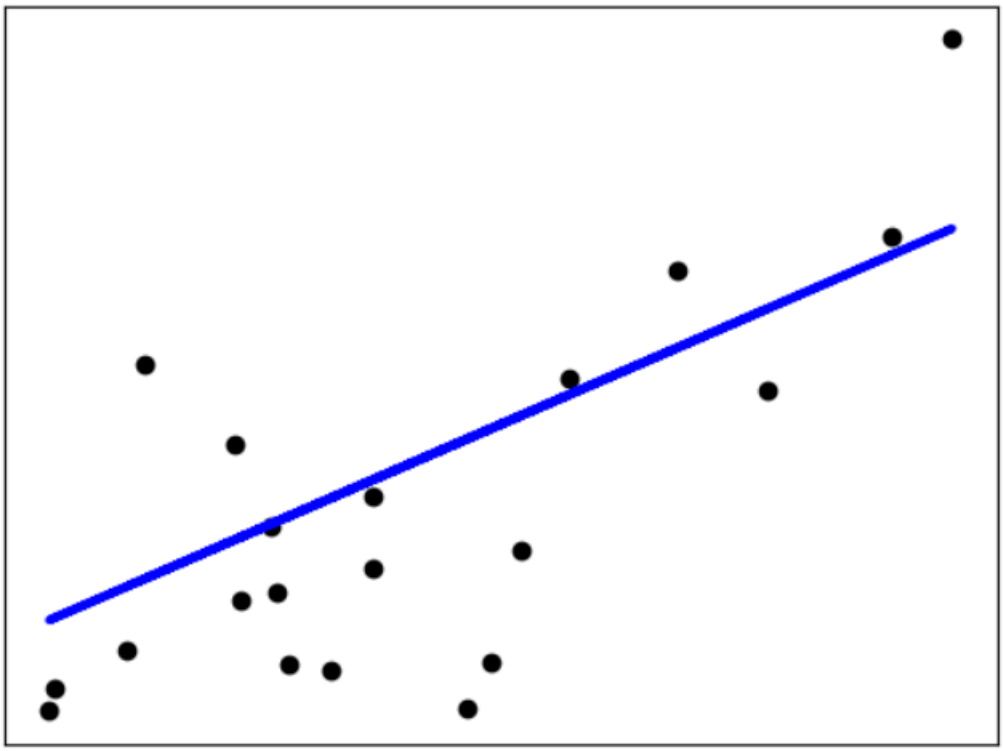
Problem Statement:
The growth of supermarkets in most populated cities is increasing and market competitions are also high. The dataset is one of the historical sales of Supermarket Company which has recorded in 3 different branches for 3 months data. Predictive data analytics methods are easy to apply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

```
# Use only one feature
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*