Author - Tejaswini Vadlamudi

DataScience & BusinessAnalytics Intern - The Spark Foundation #GRIPJUNE21

Prediction using Supervised ML Task1

Predict the percentage of an student based on the no. of study hours.

```
#Importing libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

```
url='https://raw.githubusercontent.com/AdiPersonalWorks/Random/master/student_scores%20-%20student_scores.csv'
```

```
#Importing Data into DataFrame and checking first 5 values
data=pd.read_csv(url)
data.head()
```

```
   Hours  Scores
0    2.5      21
1    5.1      47
2    3.2      27
3    8.5      75
4    3.5      30
```

```
#Checking Datatypes
data.dtypes
```

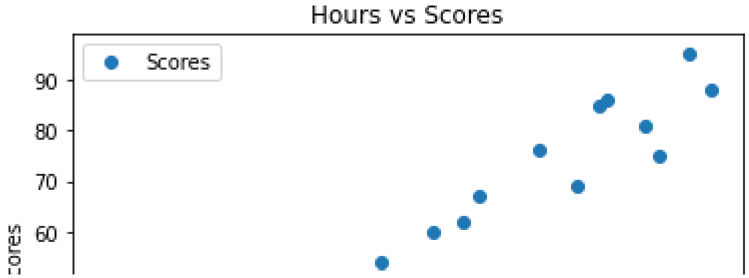
```
Hours     float64
Scores      int64
dtype: object
```

```
#Checking For missing Data
missing_data=data.isnull()
for column in missing_data.columns.values.tolist():
    print(column)
    print (missing_data[column].value_counts())
    print("")
```

```
Hours
False    25
Name: Hours, dtype: int64

Scores
False    25
Name: Scores, dtype: int64
```

```
#Checking Relationship between Hours and scores by plotting a scatterplot
data.plot(x='Hours',y='Scores',style= 'o')
plt.title('Hours vs Scores')
plt.xlabel('Hours')
plt.ylabel('Scores')
plt.show()
```



```
data.corr()
```

	Hours	Scores
Hours	1.000000	0.976191
Scores	0.976191	1.000000

```
#Preparing Data
x = data.iloc[:,:-1].values #Hours
y = data.iloc[:, 1].values #Scores
```

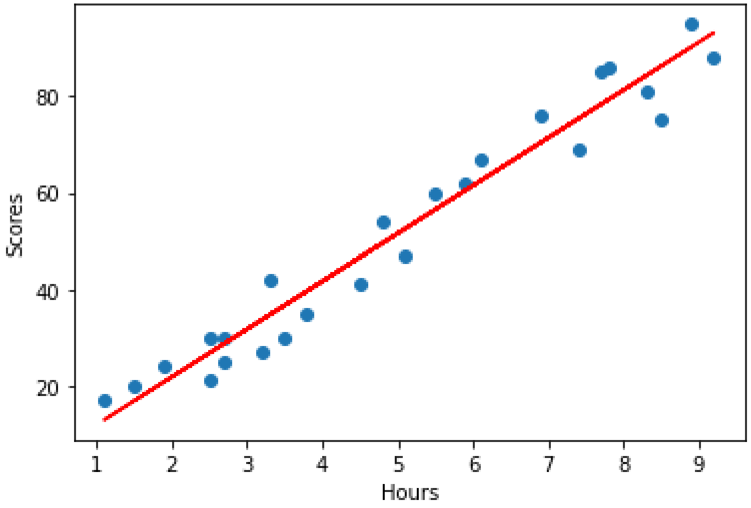
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x,y, test_size = 0.2, random_state = 0)
```

Training Algorithm

```
from sklearn.linear_model import LinearRegression
lr=LinearRegression()
lr.fit(x_train,y_train)
print("Successfully Trained")
```

```
     Successfully Trained
```

```
#Plotting graph for regression line
line = lr.coef_*x +lr.intercept_
plt.scatter (x,y)
plt.plot(x,line,color='Red')
plt.xlabel('Hours')
plt.ylabel('Scores')
plt.show()
```



Predictions

```
Y_predictions=lr.predict(x_test)
```

```
print(x_test,Y_predictions)
```

```
[[1.5]
 [3.2]
 [7.4]
 [2.5]
 [5.9]] [16.88414476 33.73226078 75.357018   26.79480124 60.49103328]
```

```
#Checking Our own Prediction by some hours value
hrs=float(input("Enter No of hours: "))
scores_prediction=lr.predict([[hrs]])
print(f"Predicted score for {hrs} hours study per day is {scores_prediction[0]}")
```

```
Enter No of hours: 9.25
Predicted score for 9.25 hours study per day is 93.69173248737539
```

Model Evalution

```
df = pd.DataFrame({'Actual': y_test, 'Predicted': Y_predictions})
df
```

	Actual	Predicted
0	20	16.884145
1	27	33.732261
2	69	75.357018
3	30	26.794801
4	62	60.491033

```
#Visualizing Actual vs predicted values in graph
import seaborn as sns
%matplotlib inline
ax1 = sns.distplot(y_test, hist=False, color="red", label="Actual Value")
sns.distplot(Y_predictions, hist=False, color="blue", label="Predicted Values" , ax=ax1)
plt.title('Actual vs Predicted Values for Scores')
plt.show()
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/distributions.py:2557: FutureWarning: `distplot` is a deprecated functic
  warnings.warn(msg, FutureWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/distributions.py:2557: FutureWarning: `distplot` is a deprecated functic
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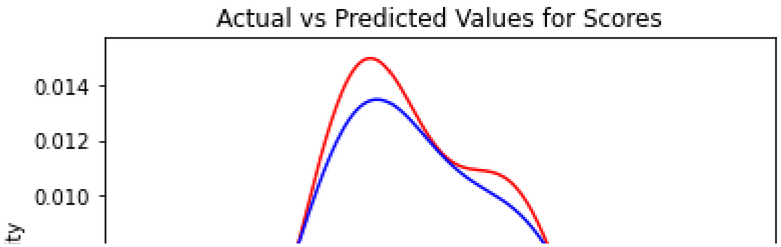

```
#Mean Absolute error
from sklearn import metrics
print('Mean Absolute Error:',
      metrics.mean_absolute_error(y_test, Y_predictions))
```

```
Mean Absolute Error: 4.183859899002982
```

What will be predicted score if a student studies for 9.25 hrs/ day?

```
print(f"Predicted score for {hrs} hours study per day is {scores_prediction[0]}")
```

```
Predicted score for 9.25 hours study per day is 93.69173248737539
```

Thank You

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