GO_STP_5856 - Ashwin S

Assignment-7

Prediction using Supervised Machine Learning using Simple Linear Regression

In this task we have to find the students scores based on their study hours. This is a simple Regression problem type because it has only two variables

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn import preprocessing
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error, mean_absolute_error, r2_score, accuracy_sc
```

Reading the data

```
df = pd.read_csv("/content/StudentHoursScores.csv")  # Reading the dataset...
```

Analysing the data

```
df.head()
```

	Hours	Scores
0	7.7	79
1	5.9	60
2	4.5	45
3	3.3	33
4	1.1	12

```
df.tail()
```

	Hours	Scores
18	9.6	96
19	4.3	42
20	4.1	40

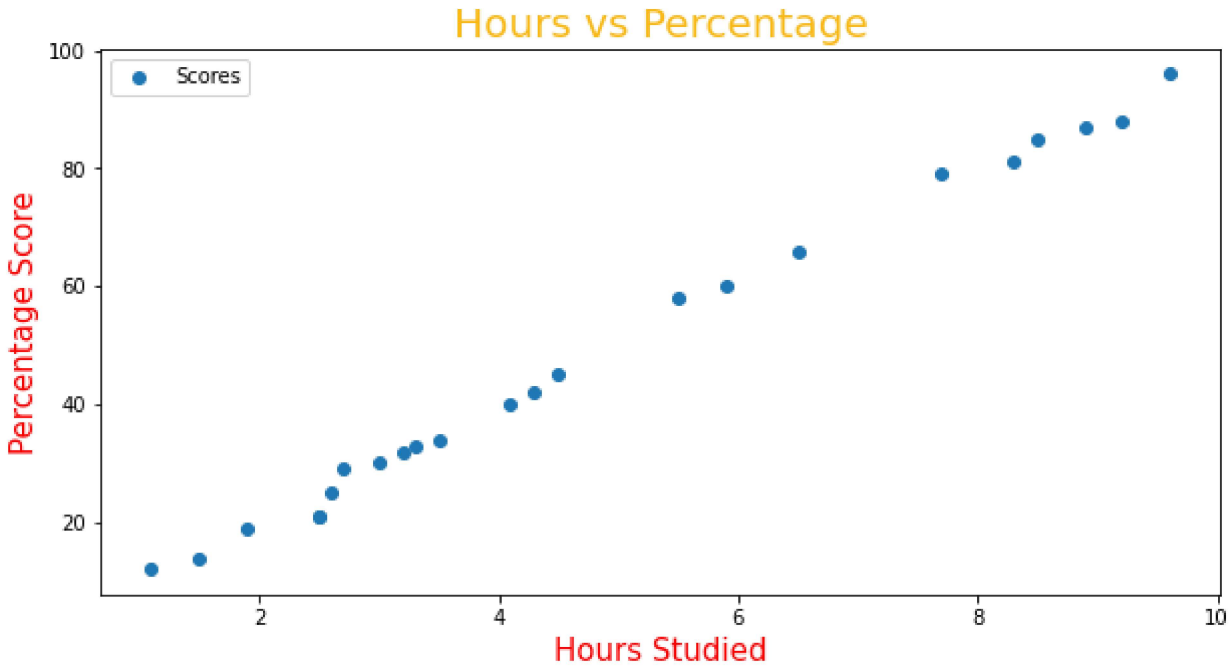
```
df.isnull().sum()
```

```
Hours     0
Scores    0
dtype: int64
```

Visualizing the data

```
df.plot(x='Hours', y='Scores', style='o', figsize=(10, 5))
plt.title('Hours vs Percentage',color="#FBB917", size=20)
plt.xlabel('Hours Studied', color="red",size=15)
plt.ylabel('Percentage Score', color="red",size=15)
```

```
Text(0, 0.5, 'Percentage Score')
```



Data preprocessing

```
X = df.iloc[:, :-1].values
y = df.iloc[:, 1].values
```

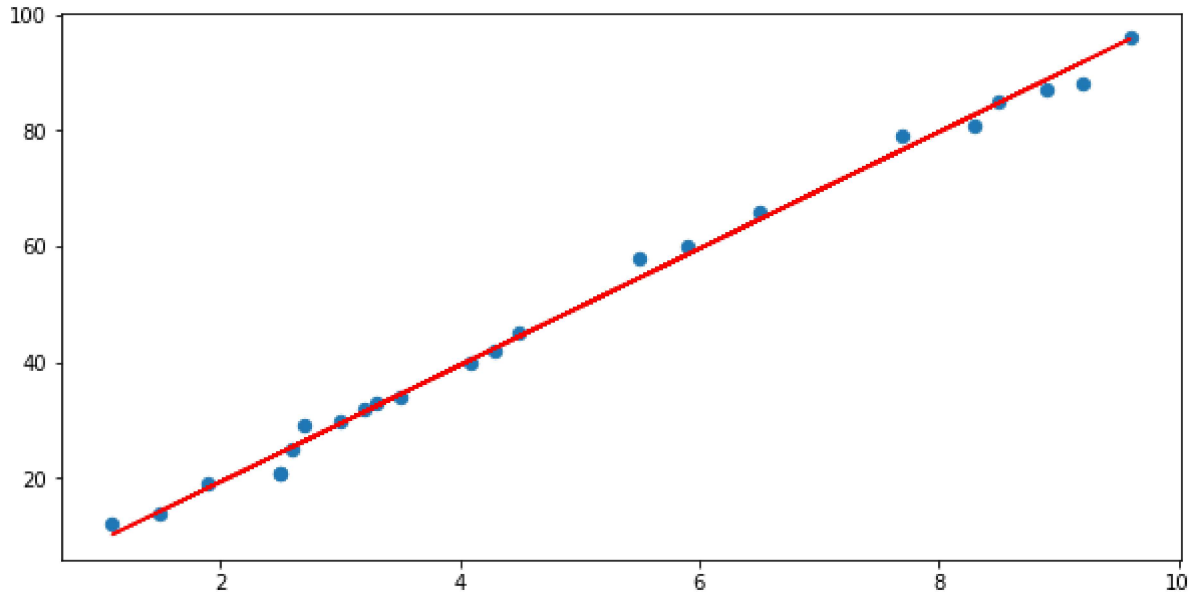
Model Training

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=0)
regressor = LinearRegression()
regressor.fit(X_train, y_train)
print("Training complete.")
```

```
Training complete.
```

Plotting the line of Regression:

```
line = regressor.coef_*X+regressor.intercept_
# Plotting for the test data
plt.figure(figsize=(10, 5))
plt.scatter(X, y, s=40)
plt.plot(X, line, color="red")
plt.show()
```



Making Predictions

```
print(X_test) # Testing data - In Hours
y_pred = regressor.predict(X_test)
```

```
[[9.2]
 [5.5]
 [3. ]
 [8.5]
 [4.1]]
```

Comparing Actual vs Predicted values

```
df1 = pd.DataFrame({'Actual': y_test, 'Predicted': y_pred})
df1
```

	Actual	Predicted
0	88	91.818828
1	58	54.569310
2	30	29.400718
3	85	84.771622
4	40	40.474898

```
print("Training Score: ",regressor.score(X_train, y_train))
print("Test Score: ",regressor.score(X_test, y_test))
```

```
Training Score:  0.9959881759446586
Test Score:  0.9900509060111311
```

Predicting Values

```
n = float(input("Enter the Number of Hours: "))
own_pred = regressor.predict(np.array([n]).reshape(-1,1)) # Asking the input and convertin
print("No of Hours = {}\nPredicted Score = {}".format(n,own_pred[0]))  # Printing the valu
print("Hence if a student studies for {0} Hours then his score will be {1:.2f}%".format(n,
```

```
Enter the Number of Hours: 8.0
No of Hours = 8.0
Predicted Score = 79.73790331736336
Hence if a student studies for 8.0 Hours then his score will be 79.74%
```

Evaluation

```
print("Mean Squared Error: ",mean_squared_error(y_test, y_pred))
print("Mean Absolute Error: ",mean_absolute_error(y_test, y_pred))
print("Root Mean Squared Error: ",np.sqrt(mean_absolute_error(y_test, y_pred)))
print("R - 2: ",r2_score(y_test, y_pred))
```

```
Mean Squared Error:  5.397980434600632
Mean Absolute Error:  1.7104152948388986
Root Mean Squared Error:  1.3078284653726187
R - 2:  0.9900509060111312
```

✓ 0s completed at 10:23 AM