The Sparks Foundation - GRIP - Data Science and Business Analytics Intern - JULY-2021

TASK 1 - Prediction using Supervised ML

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In this task We are going Predicting the percentage of an student based on the number of study hours using linear regression algorithm

Step1 Defining objectives

In [4]:

```
#importing nessessary libraries
import sklearn
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sn
```

Step2 Data collection

In [5]:
```
#importing the dataset and displaying
dt=pd.read_csv("http://bit.ly/w-data")
dt
```

Out[5]:

	Hours	Scores
0	2.5	21
1	5.1	47
2	3.2	27
3	8.5	75
4	3.5	30
5	1.5	20
6	9.2	88
7	5.5	60
8	8.3	81
9	2.7	25
10	7.7	85
11	5.9	62
12	4.5	41
13	3.3	42
14	1.1	17
15	8.9	95
16	2.5	30
17	1.9	24
18	6.1	67
19	7.4	69
20	2.7	30
21	4.8	54
22	3.8	35
23	6.9	76
24	7.8	86

Step3 Data Preprocessing

In [6]:

```
dt.describe()
```

Out[6]:

	Hours	Scores
count	25.000000	25.000000
mean	5.012000	51.480000
std	2.525094	25.286887
min	1.100000	17.000000
25%	2.700000	30.000000
50%	4.800000	47.000000
75%	7.400000	75.000000
max	9.200000	95.000000

In [7]:

```
#checking the null values
dt.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 25 entries, 0 to 24
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   Hours   25 non-null     float64
 1   Scores  25 non-null     int64  
dtypes: float64(1), int64(1)
memory usage: 528.0 bytes
```

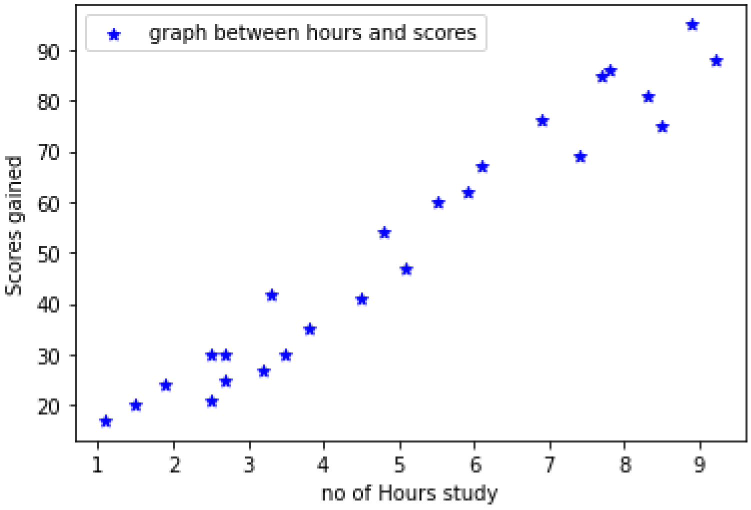
Step4 Data Visualization

In [8]:

```
x=dt["Hours"]
y=dt["Scores"]
plt.xlabel("no of Hours study")
plt.ylabel("Scores gained")
plt.scatter(x,y,marker="*",color="blue",label="graph between hours and scores")
plt.legend()
```

Out[8]:

```
<matplotlib.legend.Legend at 0x1f94d35e220>
```



Step5 Spliting of dataset into testing and training/Model selection

In [9]:

```
x=dt.iloc[:,:-1].values
y=dt.iloc[:,-1].values

from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest=train_test_split(x,y,test_size=1/3,random_state=1)
```

Creating simple linear model

In [10]:

```
from sklearn.linear_model import LinearRegression
model=LinearRegression()           # which creates linear equation y=ax+b
model.fit(xtrain,ytrain)
```

Out[10]:

```
LinearRegression()
```

Step6 Prediction of data/ Model Building

In [11]:

```
y_pred=model.predict(xtest)
y_pred
```

Out[11]:

```
array([10.56351243, 33.29165695, 18.82829225, 87.01272581, 48.78811912,
       78.74794599, 62.21838634, 75.64865355, 35.3578519 ])
```

comparing actual vs predicted

In [12]:
```
dt=pd.DataFrame({'Actual':ytest,'Predicted':y_pred})
dt
```

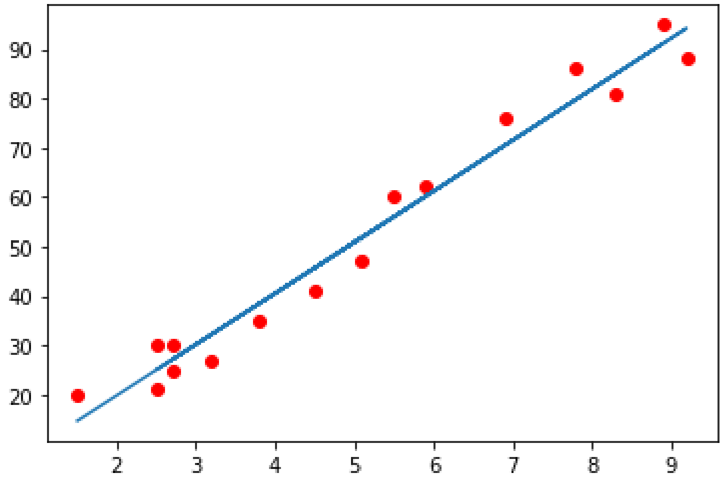
Out[12]:

	Actual	Predicted
0	17	10.563512
1	42	33.291657
2	24	18.828292
3	75	87.012726
4	54	48.788119
5	85	78.747946
6	67	62.218386
7	69	75.648654
8	30	35.357852

checking training data prediction

In [13]:
```
plt.scatter(xtrain,ytrain,color="red")
plt.plot(xtrain,model.predict(xtrain))
```

Out[13]:
```
[<matplotlib.lines.Line2D at 0x1f94db603d0>]
```



In [14]:
```
print("model cofficient",model.coef_)
print("model interception",model.intercept_)
```

```
model cofficient [10.33097478]
model interception -0.8005598320504035
```

In [15]:
```
print("Training Accuracy:",model.score(xtrain,ytrain),"\nTesting Accuracy:",mode
```

```
Training Accuracy: 0.9693800724956538
Testing Accuracy: 0.9047140370739192
```

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

In [16]:

```
hours=9.25
pred=model.predict([[hours]])
print(f"student studies for {hours} his estimated score will be {float(pred)}")
```

```
student studies for 9.25 his estimated score will be 94.76095689811578
```

In [ ]: