The Sparks Foundation - GRIP - Data Science and Business Analytics - DECEMBER2021

TASK 1 : Prediction using supervised ML

Dataset used: Student Scores

Problem Statement(s) :

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

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

Import required libraries

```
import warnings
warnings.filterwarnings("ignore")

import pandas as pd
import numpy as np

import matplotlib.pyplot as plt
import seaborn as sns
```

Reading the csv dataset and setting the path

```
path = r"C:\Users\prati\Desktop\TSF\task1\student_scores.csv.txt"
s_data = pd.read_csv(path)

s_data.head()
```

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

```
s_data.shape
```

```
(25, 2)
```

```
s_data.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
```

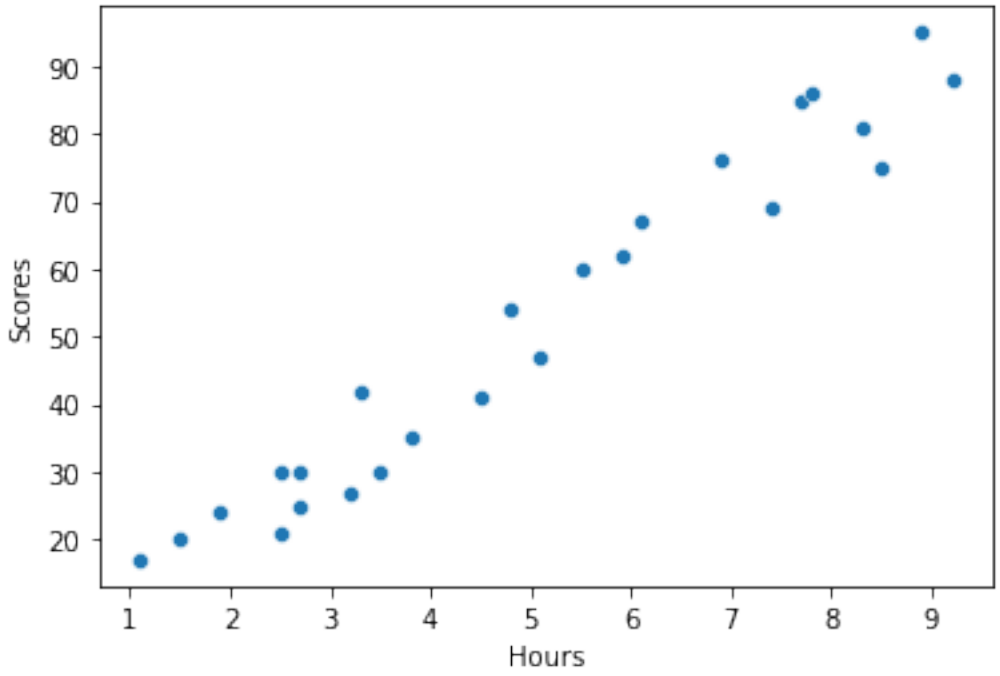
```
dtypes: float64(1), int64(1)
memory usage: 528.0 bytes
```

```
s_data.describe()
```

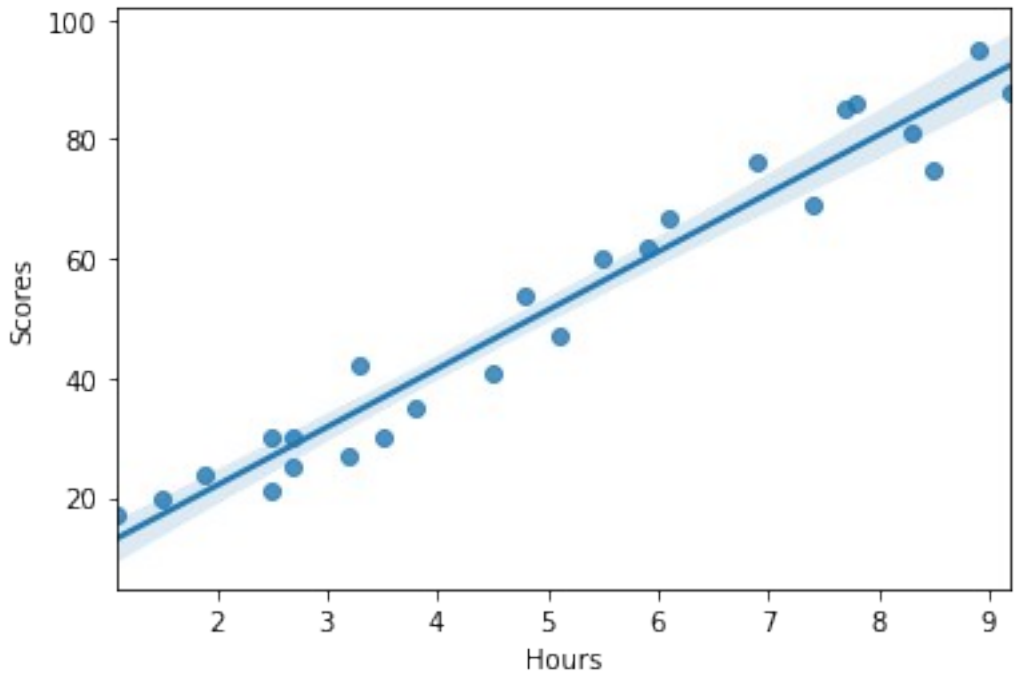
```
           Hours     Scores
count  25.000000  25.000000
mean    5.012000  51.480000
std     2.525094  25.286887
min     1.100000  17.000000
25%     2.700000  30.000000
50%     4.800000  47.000000
75%     7.400000  75.000000
max     9.200000  95.000000
```

Visualization of data

```
sns.scatterplot(x=s_data['Hours'], y=s_data['Scores']);
```




```
sns.regplot(x=s_data['Hours'], y=s_data['Scores']);
```



Features and targets

```
X = s_data[['Hours']]
y = s_data['Scores']
```

Train and split

```
from sklearn.model_selection import train_test_split

train_X, val_X, train_y, val_y = train_test_split(X, y, random_state =
0)
```

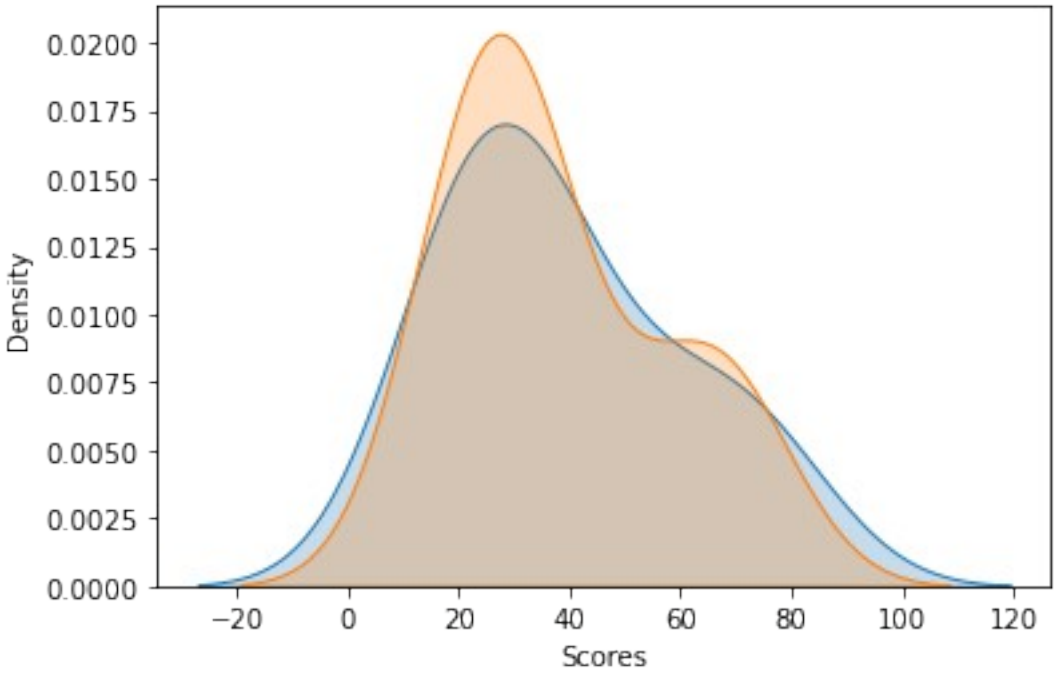
Model building

```
from sklearn.linear_model import LinearRegression

regressor = LinearRegression()

regressor.fit(train_X, train_y)

LinearRegression()

pred_y = regressor.predict(val_X)

pd.DataFrame({'Actual': val_y, 'Predicted': pred_y})
```

```
    Actual  Predicted
5       20  16.844722
2       27  33.745575
19      69  75.500624
16      30  26.786400
11      62  60.588106
```

```
22      35  39.710582
17      24  20.821393
```

```
sns.kdeplot(pred_y,label="Predicted", shade=True);

sns.kdeplot(data=val_y, label="Actual", shade=True);
```




```
print('Train accuracy: ', regressor.score(train_X, train_y),'\nTest
accuracy : ', regressor.score(val_X, val_y) )
```

```
Train accuracy:  0.9484509249326872
Test accuracy :  0.9367661043365056
```

```
# Predict percent for custom input value for hours
# Q. What will be predicted score if a student studies for 9.25 hrs/
day?

h = [[9.25]]
s = regressor.predict(h)
print('A student who studies ', h[0][0] , ' hours is estimated to
score ', s[0])
```

```
A student who studies  9.25  hours is estimated to score
93.89272889341652
```