THE SPARKS FOUNDATION

DATA SCIENCE AND BUSINESS ANALYTICS INTERNSHIP

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TASK 1 - Prediction using Supervised ML

Importing the libraries

In [2]:
```
# Importing all libraries required in this notebook
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

In [3]:
```
# Reading data from remote link
url = "http://bit.ly/w-data"
sample_data = pd.read_csv(url)
print("Data imported sucessfully")

sample_data.head(10)
```

```
Data imported sucessfully
```

Out[3]:

	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

	Hours	Scores
7	5.5	60
8	8.3	81
9	2.7	25

In [4]:
```
# Reading data information
sample_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
```

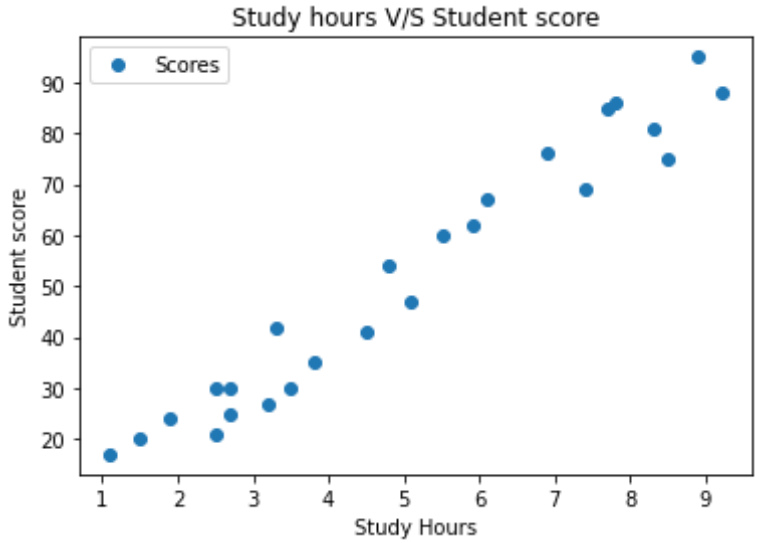
In [5]:
```
# Describing dataset
sample_data.describe()
```

Out[5]:

	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 [6]:
```
# Plotting scatter plot
sample_data.plot(x='Hours', y='Scores', style='o')
```

```
plt.title('Study hours V/S Student score')
plt.xlabel('Study Hours')
plt.ylabel('Student score')
plt.show()
```



From the above graph, we can clearly see that there is a positive linear relation between the Study hours and the Student scores

Preparing The Data

In [7]:
```
# Dividing the data into "attributes"(inputs) and "labels"(outputs)
X = sample_data.iloc[:, :-1].values
y = sample_data.iloc[:, 1].values
```

In [8]:
```
X
```

Out[8]:
```
array([[2.5],
       [5.1],
       [3.2],
       [8.5],
       [3.5],
       [1.5],
       [9.2],
       [5.5],
       [8.3],
```

```
       [2.7],
       [7.7],
       [5.9],
       [4.5],
       [3.3],
       [1.1],
       [8.9],
       [2.5],
       [1.9],
       [6.1],
       [7.4],
       [2.7],
       [4.8],
       [3.8],
       [6.9],
       [7.8]])
```

In [9]:
```
y
```

Out[9]:
```
array([21, 47, 27, 75, 30, 20, 88, 60, 81, 25, 85, 62, 41, 42, 17, 95, 30,
       24, 67, 69, 30, 54, 35, 76, 86], dtype=int64)
```

In [10]:
```
# Spliting the data into training and test sets
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=194)
```

In [11]:
```
print("Shape of X train", X_train.shape)
print("Shape of Y train", y_train.shape)
print("Shape of X test", X_test.shape)
print("Shape of Y test", y_test.shape)
```

```
Shape of X train (20, 1)
Shape of Y train (20,)
Shape of X test (5, 1)
Shape of Y test (5,)
```

Training the algorithm

In [12]:
```
from sklearn.linear_model import LinearRegression
```

In [13]:
```
linear_R = LinearRegression()
linear_R.fit(X_train, y_train)
```

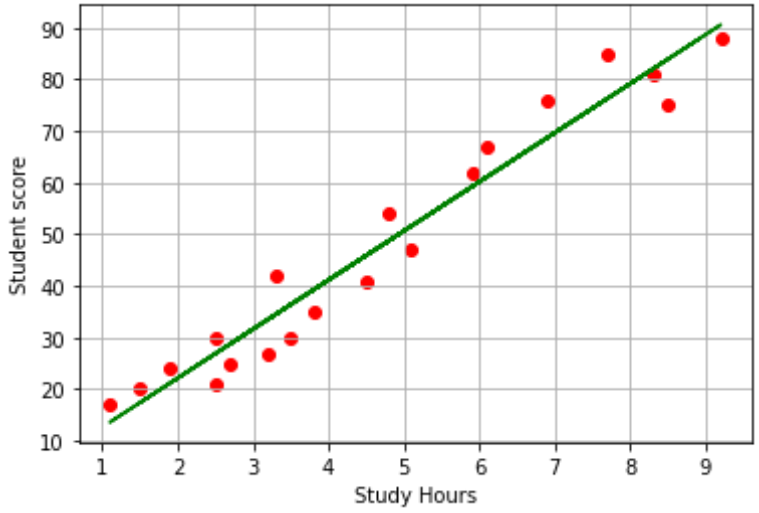
```
print("Training complete.")
```

```
Training complete.
```

Visualising the model

In [14]:
```
# Plotting the regression line.
line = linear_R.coef_*X+linear_R.intercept_

# Plotting for the test data
plt.scatter(X_train, y_train, color = 'red')
plt.plot(X, line, color = 'green');
plt.xlabel('Study Hours')
plt.ylabel('Student score')
plt.grid()
plt.show()
```



Making Predictions

In [15]:
```
print(X_test) # Testing data - In Hours
y_pred = linear_R.predict(X_test) # Predicting the scores
```

```
[[7.4]
 [5.5]]
```

```
[7.8]
[2.7]
[8.9]]
```

In [16]:
```
# Comparing Actual vs Predicted
df = pd.DataFrame({'Actual': y_test, 'Predicted': y_pred})
df
```

Out[16]:

	Actual	Predicted
0	69	73.493100
1	60	55.430595
2	86	77.295733
3	30	28.812166
4	95	87.752973

In [ ]:
```
<b>Predicti
```