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Task 1: Prediction using Supervised Machine Learning

Language: Python

Dataset Link :http://bit.ly/w-data

In [1]:
```
# Importing all libraries required in this notebook
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error
from sklearn.metrics import r2_score
from sklearn.metrics import mean_absolute_error
```

In [2]:
```
#Import the data
url="http://bit.ly/w-data"
data=pd.read_csv(url)
data1=data
print("The data is imported successfully")
data
```

```
The data is imported successfully
```

Out[2]:

	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

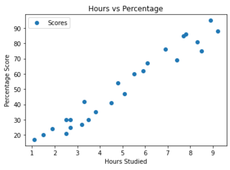
In [3]:
```
#analysis of data
data.describe()
```

Out[3]:

	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

Ploting the distribution of score

In [4]:
```
data.plot(x='Hours', y='Scores', style='o')
plt.title('Hours vs Percentage')
plt.xlabel('Hours Studied')
plt.ylabel('Percentage Score')
plt.show()
```



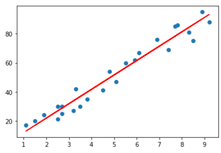
In [5]:
```
X = data.iloc[:, :-1].values # X = data['Hours]
y = data.iloc[:, 1].values # y = data['Scores']
```

In [6]:
```
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.reshape(-1,1), y_train)

print("Training complete.")
```

```
Training complete.
```

Plotting the line regression

In [7]:
```
line = regressor.coef_*X+regressor.intercept_

# Plotting for the test data
plt.scatter(X, y)
plt.plot(X, line,color='red');
plt.show()
```



Making predections

In [8]:
```
print(X_test)
y_pred = regressor.predict(X_test)
```

```
[[1.5]
 [3.2]
 [7.4]
 [2.5]
 [5.9]]
```

Comparing Actual result to the Predicted Model result

In [9]:
```
df = pd.DataFrame({'Actual': y_test, 'Predicted': y_pred})
df
```

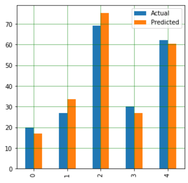
Out[9]:

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

In [10]:
```
print("Training Score:",regressor.score(X_train,y_train))
print("Test Score:",regressor.score(X_test,y_test))
```

```
Training Score: 0.9515510725211552
Test Score: 0.9454906892105356
```

In [11]:
```
df.plot(kind='bar',figsize=(5,5))
plt.grid(which='major', linewidth='0.5', color='green')
plt.grid(which='minor', linewidth='0.5', color='yellow')
plt.show()
```



In [12]:
```
hours = 9.25
test = np.array([hours])
test = test.reshape(-1, 1)
own_pred = regressor.predict(test)
print("No of Hours = {}".format(hours))
print("Predicted Score = {}".format(own_pred[0]))
```

```
No of Hours = 9.25
Predicted Score = 93.69173248737538
```