In [1]:
```
import pandas as pd
import numpy as np
```

In [2]:
```
data=pd.read_csv("Spark data.txt")
data
```

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]:
```
data.head()
```

Out[3]:

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

In [4]:
```
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]:
```
data.isnull()
```

Out[5]:

	Hours	Scores
0	False	False
1	False	False
2	False	False
3	False	False
4	False	False
5	False	False
6	False	False
7	False	False
8	False	False
9	False	False
10	False	False
11	False	False
12	False	False
13	False	False
14	False	False
15	False	False
16	False	False
17	False	False
18	False	False
19	False	False
20	False	False
21	False	False
22	False	False
23	False	False
24	False	False

In [6]:
```
data.describe()
```

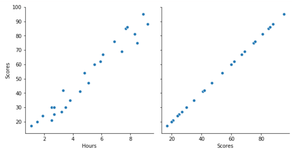
Out[6]:

	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 [ ]:
```

```

In [7]:
```
# Import matplotlib and seaborn libraries to visualize the data
import matplotlib.pyplot as plt
import seaborn as sns

# Using pairplot we'll visualize the data for correlation
sns.pairplot(data, x_vars=['Hours','Scores'],
             y_vars='Scores', size=4, aspect=1, kind='scatter')

plt.show()
```

```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\axisgrid.py:2079: UserWarning: The `size` parameter has been renamed to `height`; please update your code.
  warnings.warn(msg, UserWarning)
```



In [8]:
```
data.corr()
```

Out[8]:

	Hours	Scores
Hours	1.000000	0.976191
Scores	0.976191	1.000000

In [9]:
```
x = data.iloc[:, :-1].values #get a copy of dataset exclude last column
y = data.iloc[:, 1].values
```

In [10]:
```
print(x)
```

```
[[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 [11]:
```
print(y)
```

```
[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]
```

In [13]:
```
# Splitting the dataset into the Training set and Test set
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(x, y, test_size=1/3, random_state=0)
```

In [14]:
```
# Fitting Simple Linear Regression to the Training set
from sklearn.linear_model import LinearRegression
regressor = LinearRegression()
regressor.fit(X_train, y_train)
```

Out[14]:
```
LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
```

In [15]:
```
#retrieve the intercept:
print(regressor.intercept_)
```

```
2.5069547569547623
```

In [16]:
```
#retrieving the slope (coefficient of x):
print(regressor.coef_)
```

```
[9.69062469]
```

In [17]:
```
#making predictions
y_pred = regressor.predict(X_test)
```

In [18]:
```
print(y_pred)
```

```
[17.04289179 33.51695377 74.21757747 26.73351648 59.68164043 39.33132858
 20.91914167 78.09382734 69.37226512]
```

In [19]:
```
df = pd.DataFrame({'Actual': y_test, 'Predicted': y_pred})
df
```

Out[19]:

	Actual	Predicted
0	20	17.042892
1	27	33.516954
2	69	74.217577
3	30	26.733516
4	62	59.681640
5	35	39.331329
6	24	20.919142
7	86	78.093827
8	76	69.372265

In [25]:
```
from sklearn import metrics
print('Mean Absolute Error:', metrics.mean_absolute_error(y_test, y_pred))
print('Mean Squared Error:', metrics.mean_squared_error(y_test, y_pred))
print('Root Mean Squared Error:', np.sqrt(metrics.mean_squared_error(y_test, y_pred)))
```

```
Mean Absolute Error: 4.691397441397438
Mean Squared Error: 25.463280738222547
Root Mean Squared Error: 5.046115410711743
```

In [ ]:
```
'''#You can see that the value of root mean squared error is 4.64,
which is less than 10% of the mean value of the percentages of all the students i.e. 51.48.
This means that our algorithm did a decent job
```

In [ ]:
```

```