SPARK FOUNDATION

Q1-Predict the percentage of an student based on the no. of study hours(TASK 1)

Step 1:

Import the required library

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

In [2]:
```
data = pd.read_csv("data_list.csv")
```

Analyze The Data

In [3]:
```
data.head(10)
```

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
7	5.5	60
8	8.3	81
9	2.7	25

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

Out[4]:

	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 [5]:
```
data.shape
```

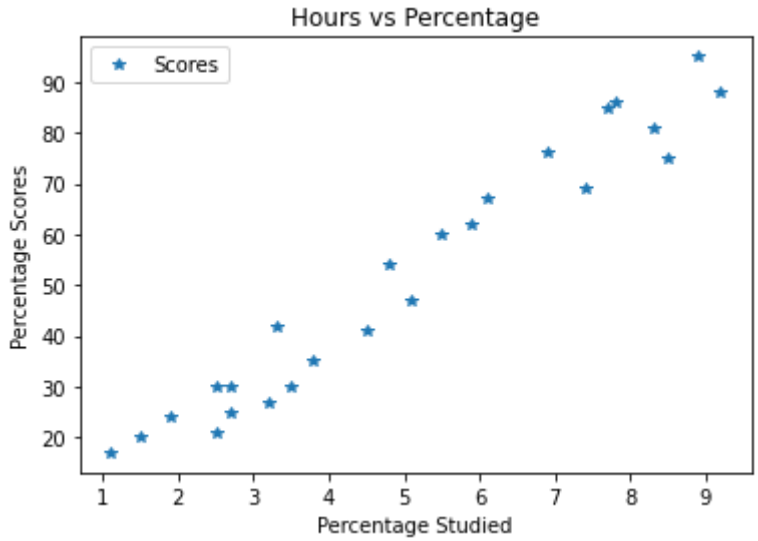
Out[5]:
```
(25, 2)
```

In [6]:
```
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
```

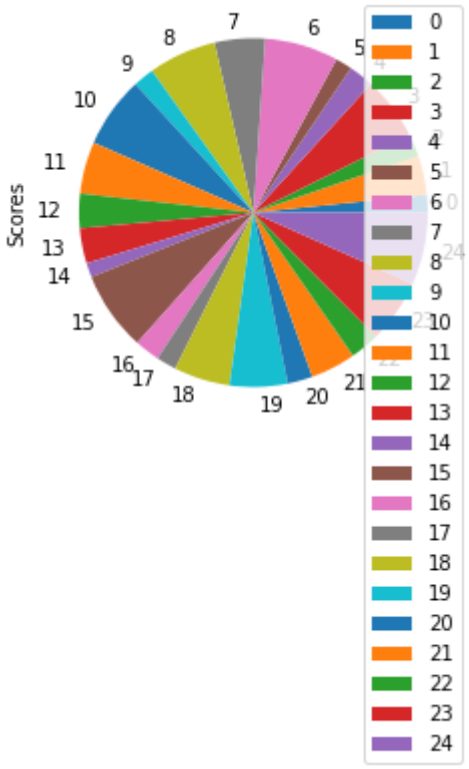
Plotting The Data In Various Type

In [7]:
```
data.plot(x='Hours', y='Scores',style='*')
plt.title('Hours vs Percentage')
plt.xlabel('Percentage Studied')
plt.ylabel('Percentage Scores')
plt.show()
```



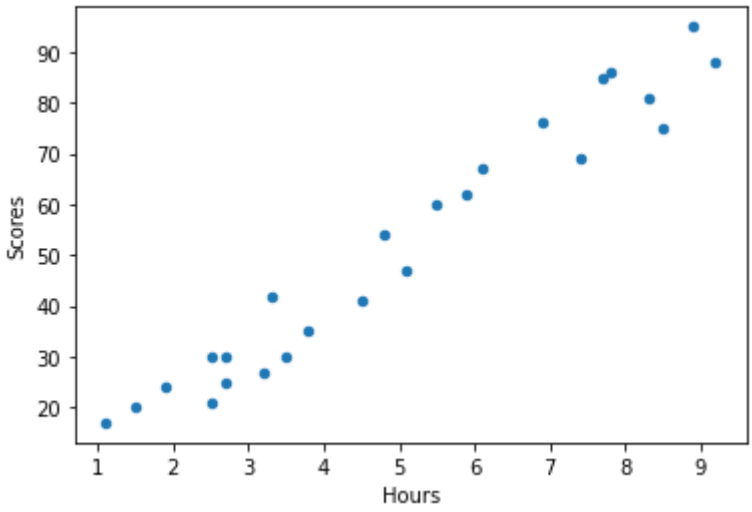
In [8]:
```
data.plot.pie(x='Hours',y='Scores')
```

Out[8]:
```
<AxesSubplot:ylabel='Scores'>
```



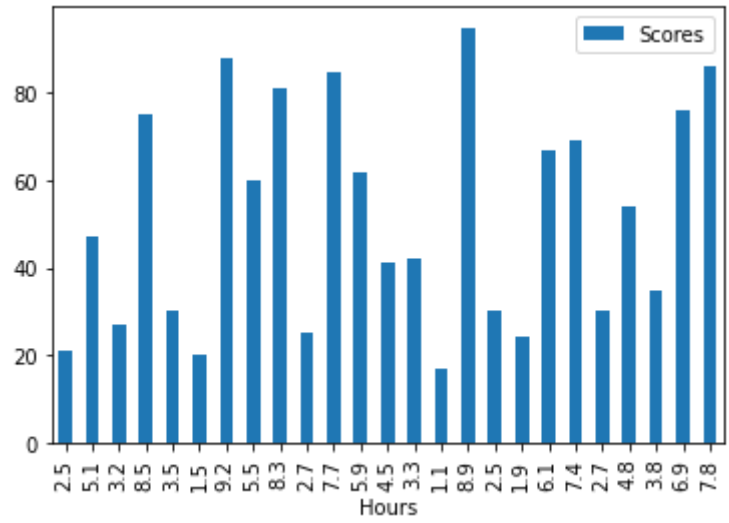
In [9]:
```
data.plot.scatter(x='Hours',y='Scores')
```

Out[9]:
```
<AxesSubplot:xlabel='Hours', ylabel='Scores'>
```



In [10]:
```
data.plot.bar(x='Hours',y='Scores')
```

Out[10]:
```
<AxesSubplot:xlabel='Hours'>
```



Preparing The Data

In [11]:
```
x = data.iloc[:,:-1].values
y = data.iloc[:,1].values
```

Splitting The Data

In [13]:
```
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_stat
```

Check Train DataSet

In [15]:
```
from sklearn.linear_model import LinearRegression
mo =LinearRegression()
mo.fit(x_train,y_train)
```

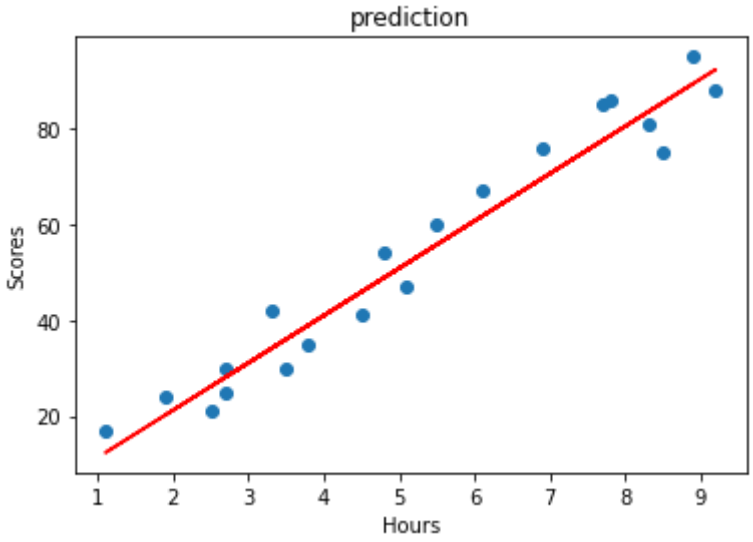
Out[15]:
```
LinearRegression()
```

In [16]:
```
print (mo.intercept_)
print (mo.coef_)
```

```
2.0181600414346974
[9.91065648]
```

Plotting The Regression Line

In [19]:
```
plt.scatter(x_train,y_train)
plt.plot(x_train,1.495142109236383+9.87171443*x_train,'r')
plt.title("prediction")
plt.xlabel("Hours")
plt.ylabel("Scores")
plt.show()
```



Making Predictions

In [21]:
```
print(x_test)
y_pred = mo.predict(x_test)
```

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

In [22]:
```
df=pd.DataFrame({'Actual': y_test,'Predicted':y_pred})
df
```

Out[22]:

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

In [23]:
```
df = pd.DataFrame({'Actual':y_test,'Predicted' : y_pred})
df
```

Out[23]:

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

Q2-Predicting The Score For The Study Of 9.25 Hours

In [24]:
```
pred_score = mo.predict([[9.25]])
```

```
print("The predictdn score is :",pred_score)
```

```
The predictdn score is : [93.69173249]
```

Evaluating The Model

In [25]:

```
from sklearn import metrics
print('Mean Absolute Error:',metrics.mean_absolute_error(y_test,y_pred))
```

```
Mean Absolute Error: 4.183859899002975
```

In [ ]: