COTB29 : ANURAG ABHAY PARGAONKAR ASSIGNMENT NO.04

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

In [2]:
```
x=np.array([95,85,80,70,60])
y=np.array([85,95,70,65,70])
```

In [3]:
```
model=np.polyfit(x,y,1)
```

In [4]:
```
model
```

Out[4]:
```
array([  0.64383562,  26.78082192])
```

In [5]:
```
predict=np.poly1d(model)
predict(65)
```

Out[5]:
```
68.630136986301366
```

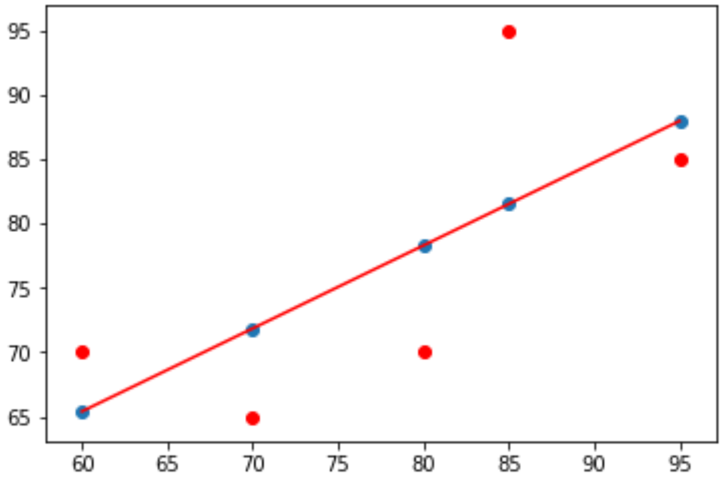
In [6]:
```
y_pred=predict(x)
y_pred
```

Out[6]:
```
array([ 87.94520548,  81.50684932,  78.28767123,  71.84931507,  65.4
109589 ])
```

In [7]:
```
from sklearn.metrics import r2_score
r2_score(y, y_pred)
```

Out[7]:
```
0.48032180908893263
```

In [8]:
```
y_line=model[1]+model[0]* x
plt.plot(x,y_line,c='r')
plt.scatter(x,y_pred)
plt.scatter(x,y,c='r')
plt.show()
```



In [9]:
```
from sklearn.datasets import load_boston
boston=load_boston()
```

In [10]:
```
data=pd.DataFrame(boston.data)
```

In [11]:
```
data.columns=boston.feature_names
data.head()
```

Out[11]:

	CRIM	ZN	INDUS	CHAS	NOX	RM	AGE	DIS	RAD	TAX	PTRATIO	B	LS
0	0.00632	18.0	2.31	0.0	0.538	6.575	65.2	4.0900	1.0	296.0	15.3	396.90	
1	0.02731	0.0	7.07	0.0	0.469	6.421	78.9	4.9671	2.0	242.0	17.8	396.90	
2	0.02729	0.0	7.07	0.0	0.469	7.185	61.1	4.9671	2.0	242.0	17.8	392.83	
3	0.03237	0.0	2.18	0.0	0.458	6.998	45.8	6.0622	3.0	222.0	18.7	394.63	
4	0.06905	0.0	2.18	0.0	0.458	7.147	54.2	6.0622	3.0	222.0	18.7	396.90	

In [12]:
```
data['PRICE'] = boston.target
```

In [13]:
```
data.isnull().sum()
```

Out[13]:
```
CRIM       0
ZN         0
INDUS      0
CHAS       0
NOX        0
RM         0
AGE        0
DIS        0
RAD        0
TAX        0
PTRATIO    0
B          0
LSTAT      0
PRICE      0
dtype: int64
```

In [14]:
```
x = data.drop(['PRICE'], axis = 1)
y = data['PRICE']
```

In [15]:
```
from sklearn.model_selection import train_test_split
xtrain, xtest, ytrain, ytest = train_test_split(x, y, test_size =0.2,
```

In [16]:
```
import sklearn
from sklearn.linear_model import LinearRegression
lm = LinearRegression()
model=lm.fit(xtrain, ytrain)
```

In [17]:
```
ytrain_pred = lm.predict(xtrain)
ytest_pred = lm.predict(xtest)
```

In [18]:
```
df=pd.DataFrame(ytrain_pred,ytrain)
df=pd.DataFrame(ytest_pred,ytest)
```

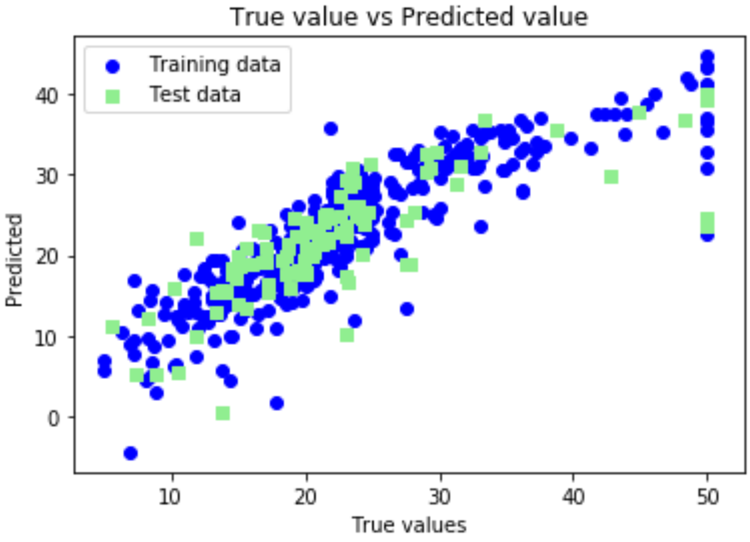
In [19]:

```
from sklearn.metrics import mean_squared_error, r2_score
mse = mean_squared_error(ytest, ytest_pred)
print(mse)
mse = mean_squared_error(ytrain_pred,ytrain)
print(mse)
```

```
33.4507089677
19.3300193573
```

In [20]:

```
plt.scatter(ytrain ,ytrain_pred,c='blue',marker='o',label='Training d
plt.scatter(ytest,ytest_pred ,c='lightgreen',marker='s',label='Test d
plt.xlabel('True values')
plt.ylabel('Predicted')
plt.title("True value vs Predicted value")
plt.legend(loc= 'upper left')
#plt.hlines(y=0,xmin=0,xmax=50)
plt.plot()
plt.show()
```


True value vs Predicted value
● Training data
🟩 Test data
Predicted
True values