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

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 [7]:
```
predict=np.poly1d(model)
predict(65)
```

Out[7]:
```
68.63013698630137
```

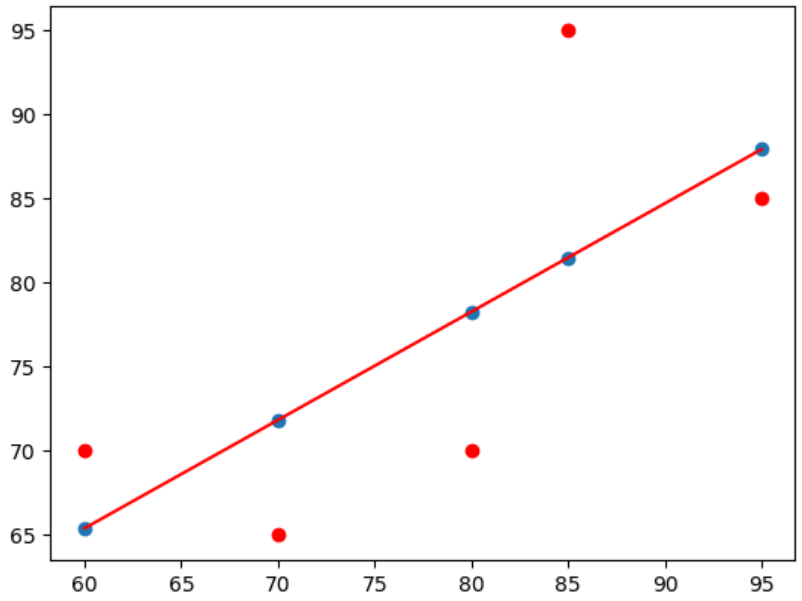
In [8]:
```
y_pred=predict(x)
y_pred
```

Out[8]:
```
array([87.94520548, 81.50684932, 78.28767123, 71.84931507, 65.4109589 ])
```

In [9]:
```
from sklearn.metrics import r2_score
r2_score(y,y_pred)
```

Out[9]:
```
0.4803218090889326
```

In [10…
```
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 [11…
```
data=pd.read_csv('/home/student/Desktop/Boston.csv')
```

In [12…
```
data.head(9)
```

Out[12]:

	polyId	crim	zn	indus	chas	nox	rm	age	dis	rad	tax	ptratio	black	lstat	medv
0	1	0.00632	18.0	2.31	0	0.538	6.575	65.2	4.0900	1	296	15.3	396.90	4.98	24.0
1	2	0.02731	0.0	7.07	0	0.469	6.421	78.9	4.9671	2	242	17.8	396.90	9.14	21.6
2	3	0.02729	0.0	7.07	0	0.469	7.185	61.1	4.9671	2	242	17.8	392.83	4.03	34.7
3	4	0.03237	0.0	2.18	0	0.458	6.998	45.8	6.0622	3	222	18.7	394.63	2.94	33.4
4	5	0.06905	0.0	2.18	0	0.458	7.147	54.2	6.0622	3	222	18.7	396.90	5.33	36.2
5	6	0.02985	0.0	2.18	0	0.458	6.430	58.7	6.0622	3	222	18.7	394.12	5.21	28.7
6	7	0.08829	12.5	7.87	0	0.524	6.012	66.6	5.5605	5	311	15.2	395.60	12.43	22.9

	polyId	crim	zn	indus	chas	nox	rm	age	dis	rad	tax	ptratio	black	lstat	medv
7	8	0.14455	12.5	7.87	0	0.524	6.172	96.1	5.9505	5	311	15.2	396.90	19.15	27.1
8	9	0.21124	12.5	7.87	0	0.524	5.631	100.0	6.0821	5	311	15.2	386.63	29.93	16.5

In [13…
```
data['crim']
```

Out[13]:
```
0      0.00632
1      0.02731
2      0.02729
3      0.03237
4      0.06905
        ...
501    0.06263
502    0.04527
503    0.06076
504    0.10959
505    0.04741
Name: crim, Length: 506, dtype: float64
```

In [14…
```
data.isnull().sum()
```

Out[14]:
```
polyId     0
crim       0
zn         0
indus      0
chas       0
nox        0
rm         0
age        0
dis        0
rad        0
tax        0
ptratio    0
black      0
lstat      0
medv       0
dtype: int64
```

In [15…
```
x=data.drop(['crim'],axis=1)
y=data['crim']
```

In [25…
```
from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest=train_test_split(x,y,test_size=0.2)
```

In [26…
```
import sklearn
from sklearn.linear_model import LinearRegression
lm=LinearRegression()
model=lm.fit(xtrain,ytrain)
```

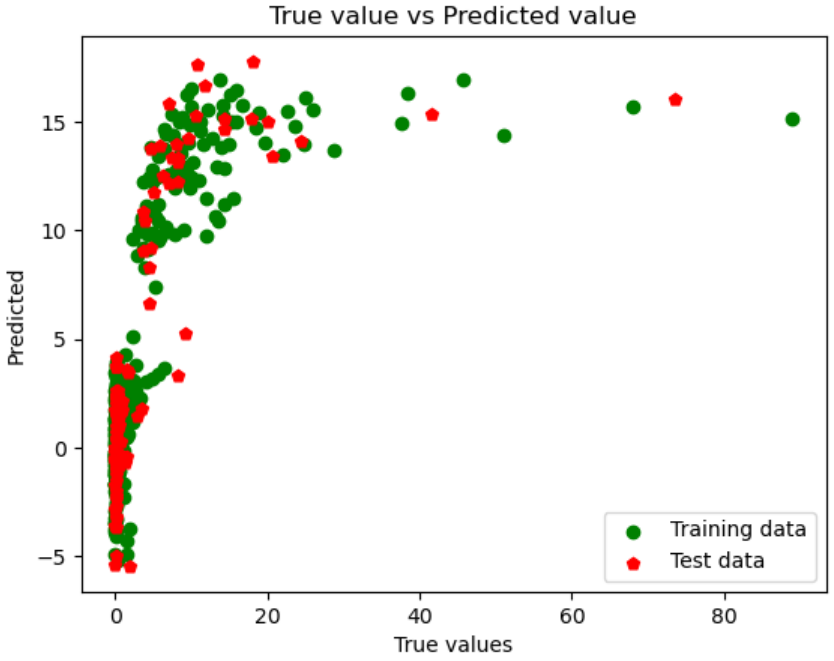
In [27…
```
ytrain_pred=lm.predict(xtrain)
ytest_pred=lm.predict(xtest)
```

In [28…
```
data=(ytrain_pred,ytrain)
data=(ytest_pred,ytest)
```

In [29…
```
#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)
```

In [30…
```
#mse=mean_squared_error(ytest,ytest_pred)
#print(mse)
```

In [32…
```
plt.scatter(ytrain,ytrain_pred,c='Green',marker='o',label='Training data')
plt.scatter(ytest,ytest_pred,c='red',marker='p',label='Test data')
plt.xlabel('True values')
plt.ylabel('Predicted')
plt.title('True value vs Predicted value')
plt.legend(loc='lower right')
plt.plot()
plt.show()
```


True value vs Predicted value
Predicted
True values
Training data
Test data
15
10
5
0
−5
0
20
40
60
80

In [ ]: