In [1]:
```
#Name: Atharv Santosh Danave
#Roll no: 11
#Practical no: 04
#Academic year: 2024-25
```

In [4]:
```
import pandas as pd
```

In [5]:
```
import numpy as np
```

In [6]:
```
import matplotlib.pyplot as plt
```

In [7]:
```
x=np.array([95,85,80,70,60])
y=np.array([85,95,70,65,70])
```

In [8]:
```
model=np.polyfit(x,y,1)
```

In [9]:
```
model
```

Out[9]:
```
array([ 0.64383562, 26.78082192])
```

In [10]:
```
predict=np.poly1d(model)
predict(65)
```

Out[10]:
```
68.63013698630135
```

In [11]:
```
y_pred=predict(x)
y_pred
```

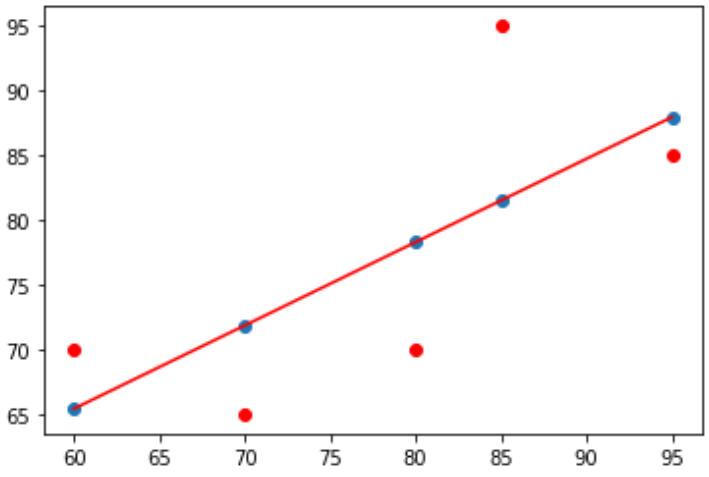
Out[11]:
```
array([87.94520548, 81.50684932, 78.28767123, 71.84931507, 65.4109589 ])
```

In [12]:
```
from sklearn.metrics import r2_score
r2_score(y,y_pred)
```

Out[12]:
```
0.4803218090889323
```

In [13]:
```
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')
```

Out[13]:
```
<matplotlib.collections.PathCollection at 0x7f0649321940>
```



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

In [3]:
```
import pandas as pd
```

In [5]:
```
import matplotlib.pyplot as plt
```

In [61]:
```
data = pd.read_csv("https://raw.githubusercontent.com/selva86/datasets/master/BostonHousing.csv")
```

In [13]:
```
data.head()
```

Out[13]:

	crim	zn	indus	chas	nox	rm	age	dis	rad	tax	ptratio	b	lstat	medv
0	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	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	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	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	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

In [15]:
```
data.tail()
```

Out[15]:

	crim	zn	indus	chas	nox	rm	age	dis	rad	tax	ptratio	b	lstat	medv
501	0.06263	0.0	11.93	0	0.573	6.593	69.1	2.4786	1	273	21.0	391.99	9.67	22.4
502	0.04527	0.0	11.93	0	0.573	6.120	76.7	2.2875	1	273	21.0	396.90	9.08	20.6
503	0.06076	0.0	11.93	0	0.573	6.976	91.0	2.1675	1	273	21.0	396.90	5.64	23.9
504	0.10959	0.0	11.93	0	0.573	6.794	89.3	2.3889	1	273	21.0	393.45	6.48	22.0
505	0.04741	0.0	11.93	0	0.573	6.030	80.8	2.5050	1	273	21.0	396.90	7.88	11.9

In [29]:
```
data.isnull().sum()
```

Out[29]:
```
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
medv       0
dtype: int64
```

In [71]:
```
x = data.iloc[:,0:13]
y = data.iloc[:,-1]
```

In [73]:
```
from sklearn.model_selection import train_test_split
xtrain, xtest, ytrain, ytest = train_test_split(x, y, test_size=0.2,random_state=0)
```

In [17]:
```
import sklearn
```

In [77]:
```
from sklearn.linear_model import LinearRegression
```

In [79]:
```
lm=LinearRegression()
```

In [86]:
```
model=lm.fit(xtrain, ytrain)
```

In [88]:
```
ytrain_pred=lm.predict(xtrain)
ytest_pred=lm.predict(xtest)
```

In [90]:
```
df=pd.DataFrame(ytrain_pred,ytrain)
```

In [92]:
```
df=pd.DataFrame(ytest_pred,ytest)
```

In [94]:
```
from sklearn.metrics import mean_squared_error,r2_score
```

In [96]:
```
mse=mean_squared_error(ytest,ytest_pred)
```

In [98]:
```
print(mse)
```

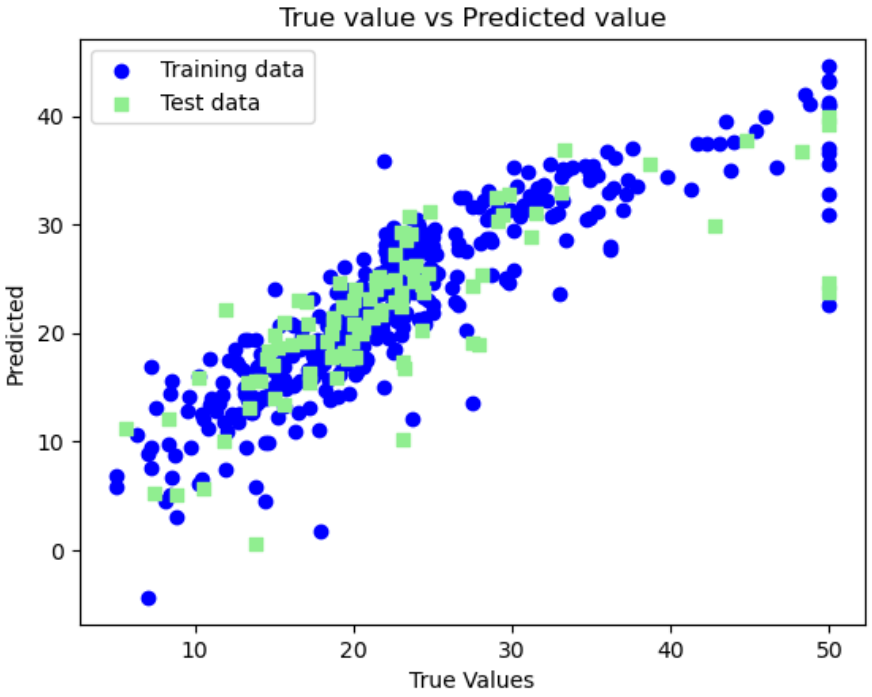
```
33.44897999767632
```

In [100…
```
mse=mean_squared_error(ytrain_pred,ytrain)
```

In [102…
```
print(mse)
```

```
19.326470203585725
```

In [106…
```
plt.scatter(ytrain,ytrain_pred,c='blue',marker='o',label='Training data')
plt.scatter(ytest,ytest_pred,c='lightgreen',marker='s',label='Test data')
plt.xlabel('True Values')
plt.ylabel('Predicted')
plt.title("True value vs Predicted value")
plt.legend(loc='upper left')
plt.plot()
plt.show()
```



In [ ]:
```
```