In [ ]:
```
# practical 4 dsbdal

```

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

In [5]:
```
x=np.array([75,89,81,75,67])
y=np.array([89,99,74,63,70])
```

In [6]:
```
model= np.polyfit(x, y, 1)
```

In [7]:
```
model
```

Out[7]:
```
array([  1.20508982, -14.2739521 ])
```

In [9]:
```
predict = np.poly1d(model)
predict(75)
```

Out[9]:
```
76.10778443113772
```

In [10]:
```
y_pred= predict(x)
y_pred
```

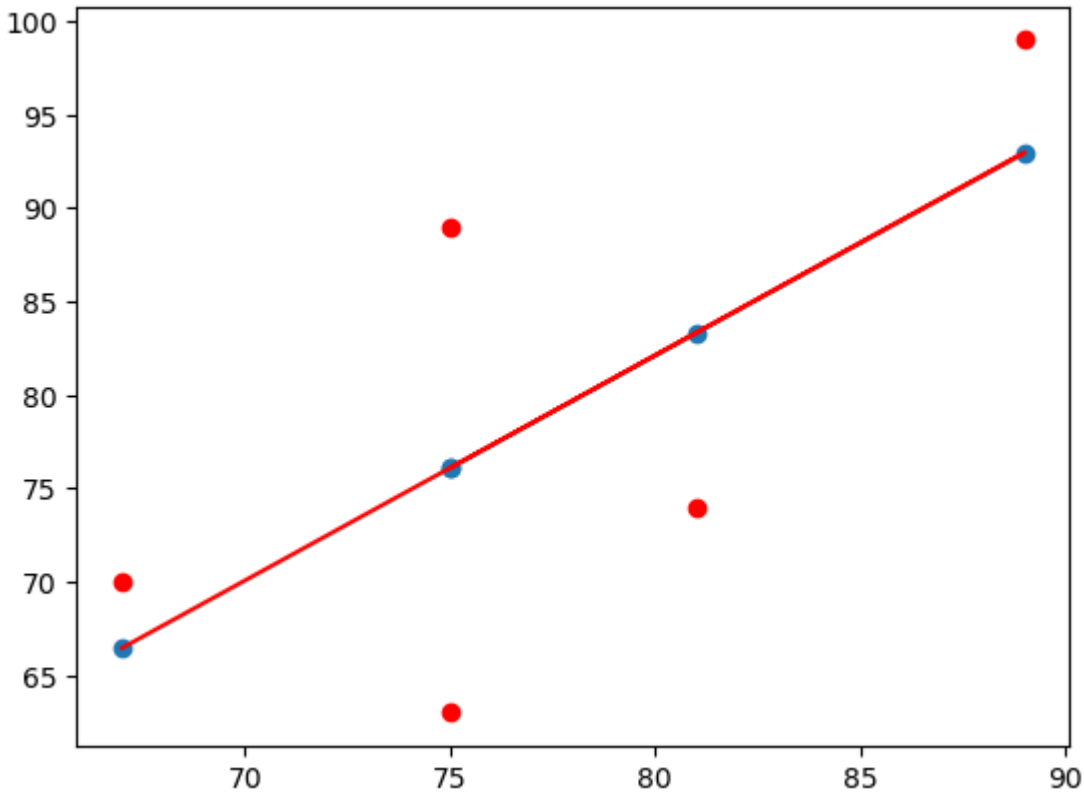
Out[10]:
```
array([76.10778443, 92.97904192, 83.33832335, 76.10778443, 66.46706587])
```

In [11]:
```
from sklearn.metrics import r2_score
r2_score(y,y_pred)
```

Out[11]:
```
0.4501611625936063
```

In [12]:
```
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[12]: <matplotlib.collections.PathCollection at 0x2d61795b0d0>



In [17]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.datasets import fetch_openml
from sklearn.model_selection import train_test_split
from sklearn.impute import SimpleImputer
from sklearn.linear_model import LinearRegression
```

In [18]:
```
# Importing Data
boston = fetch_openml(data_id=531, parser='auto')
data = pd.DataFrame(boston.data)
data.columns = boston.feature_names
data['PRICE'] = boston.target
```

In [19]:
```
# Handling Missing Values
imputer = SimpleImputer(missing_values=np.nan, strategy='mean')
x = pd.DataFrame(imputer.fit_transform(data.drop(['PRICE'], axis=1)),
columns=data.drop(['PRICE'], axis=1).columns)
y = data['PRICE']
data = data.dropna()
x = x.loc[data.index]
```

In [28]:
```
# Splitting Data
xtrain, xtest, ytrain, ytest = train_test_split(x, y, test_size=0.2,
random_state=0)
```

In [21]:
```
#Model Training
lm = LinearRegression()
model=lm.fit(xtrain, ytrain)
```

In [22]:
```
# PredictionsP
ytrain_pred = lm.predict(xtrain)
ytest_pred = lm.predict(xtest)
df=pd.DataFrame(ytrain_pred,ytrain)
df=pd.DataFrame(ytest_pred,ytest)
```

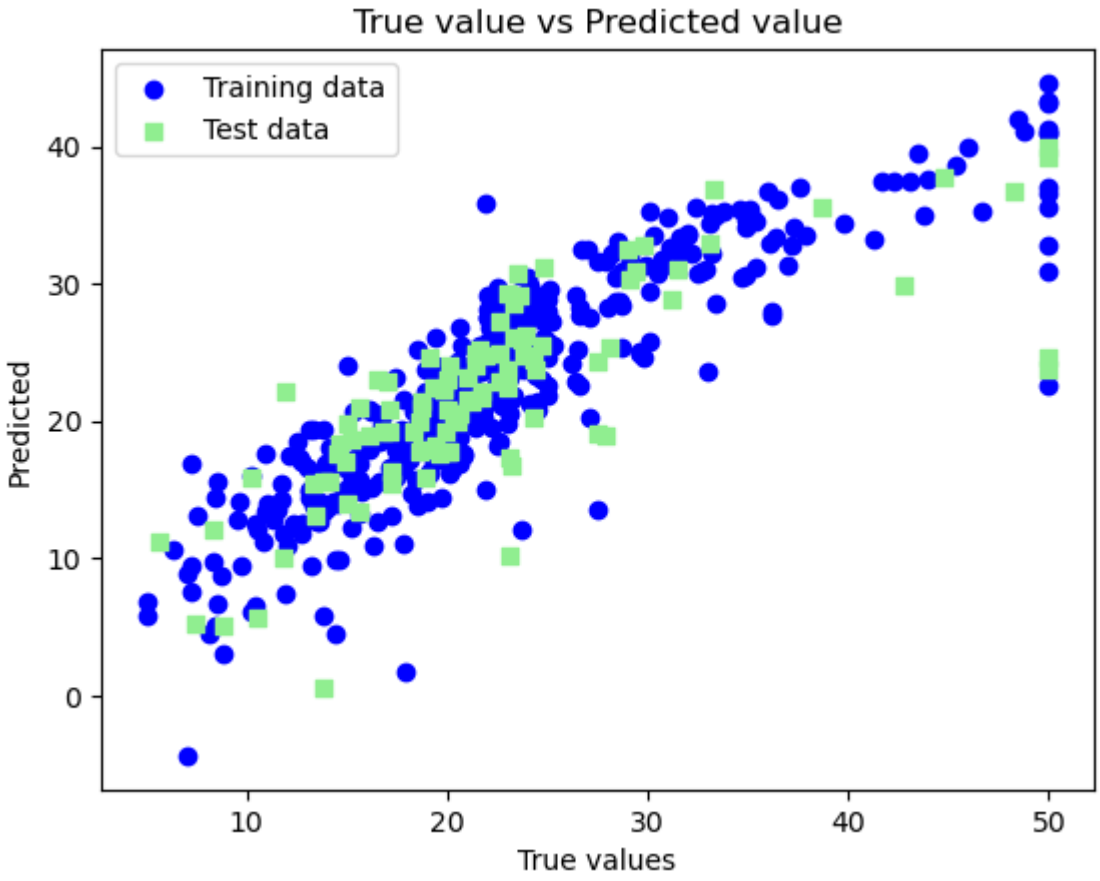
In [23]:
```
from sklearn.metrics import mean_squared_error, r2_score
mse = mean_squared_error(ytest, ytest_pred)
print(mse)
mse = mean_squared_error(ytrain_pred,ytrain)
print(mse)
```

```
33.44897999767632
19.326470203585725
```

In [24]:
```
mse = mean_squared_error(ytest, ytest_pred)
print(mse)
```

```
33.44897999767632
```

In [27]:
```
plt.scatter(ytrain ,ytrain_pred,c='blue',marker='o',label='Training dat
plt.scatter(ytest,ytest_pred ,c='lightgreen',marker='s',label='Test dat
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()
```



In [ ]:
```

```