In [ ]:
```
#5. Data Analytics I:
#Create a Linear Regression Model using Python/R to predict home prices using
#(https://www.kaggle.com/c/boston-housing). The Boston Housing dataset contair
#Boston through different parameters. There are 506 samples and 14 feature var
#The objective is to predict the value of prices of the house using the given

#if 1st not wprk then 2nd try..boston.csv nnnnn
#mam ke pdf wala
```

In [8]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

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

```
C:\ProgramData\Anaconda3\lib\site-packages\sklearn\utils\deprecation.py:87:
FutureWarning: Function load_boston is deprecated; `load_boston` is deprecat
ed in 1.0 and will be removed in 1.2.

    The Boston housing prices dataset has an ethical problem. You can refer
to
    the documentation of this function for further details.

    The scikit-learn maintainers therefore strongly discourage the use of th
is
    dataset unless the purpose of the code is to study and educate about
    ethical issues in data science and machine learning.

    In this special case, you can fetch the dataset from the original
    source::

        import pandas as pd
        import numpy as np


        data_url = "http://lib.stat.cmu.edu/datasets/boston"
        raw_df = pd.read_csv(data_url, sep="\s+", skiprows=22, header=None)
        data = np.hstack([raw_df.values[::2, :], raw_df.values[1::2, :2]])
        target = raw_df.values[1::2, 2]

    Alternative datasets include the California housing dataset (i.e.
    :func:`~sklearn.datasets.fetch_california_housing`) and the Ames housing
    dataset. You can load the datasets as follows::

        from sklearn.datasets import fetch_california_housing
        housing = fetch_california_housing()

    for the California housing dataset and::

        from sklearn.datasets import fetch_openml
        housing = fetch_openml(name="house_prices", as_frame=True)

    for the Ames housing dataset.

  warnings.warn(msg, category=FutureWarning)
```

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	LST
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	4.
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	9.
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	4.
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	2.
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	5.

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,random_state = 0)
```

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)
```

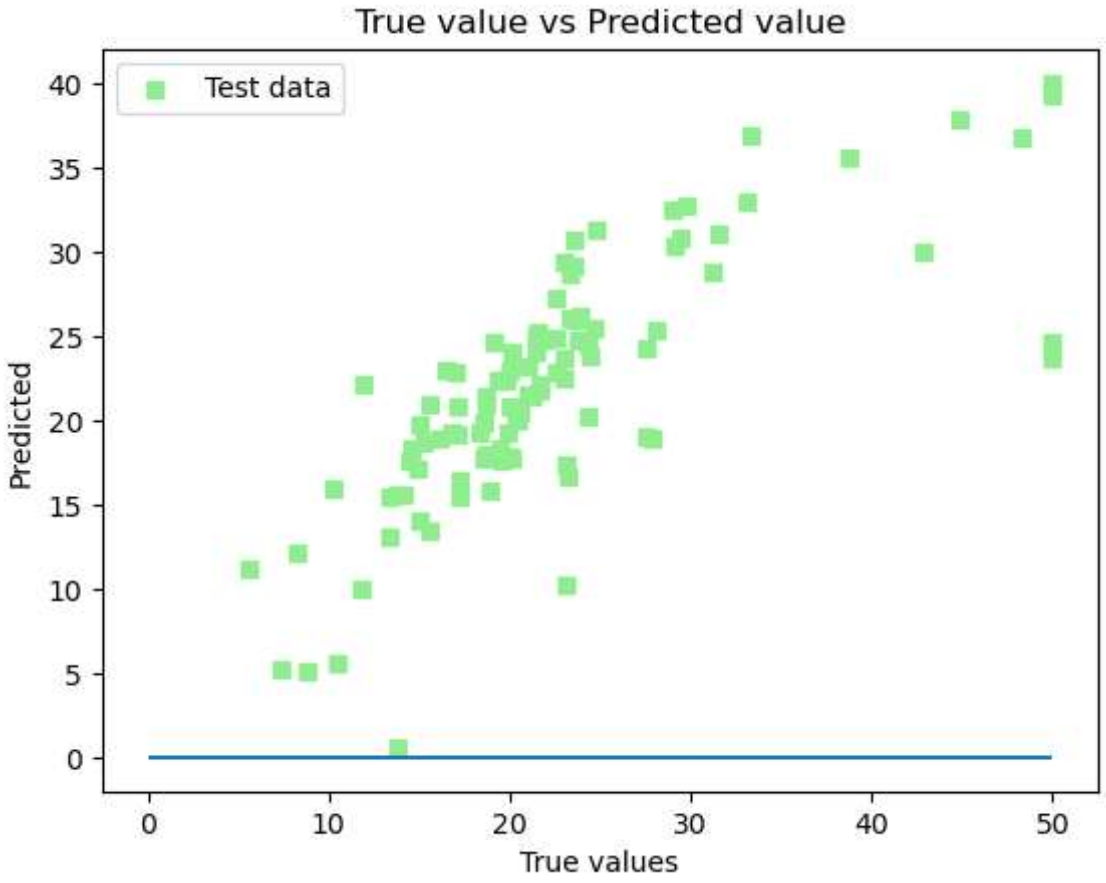
In [19]:
```
from sklearn.metrics import mean_squared_error, r2_score
mse = mean_squared_error(ytest, ytest_pred)
print(mse)
mse = mean_squared_error(ytrain_pred,ytrain)
print(mse)
```

```
33.44897999767653
19.326470203585725
```

In [20]:
```
mse = mean_squared_error(ytest, ytest_pred)
print(mse)
```

```
33.44897999767653
```

In [21]:
```
#lt.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.hlines(y=0,xmin=0,xmax=50)
plt.plot()
plt.show()
```



In [ ]:
```

```