dsbda-l4

March 5, 2025

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

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

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

[ ]:
```
model
```

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

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

[ ]:
```
68.63013698630135
```

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

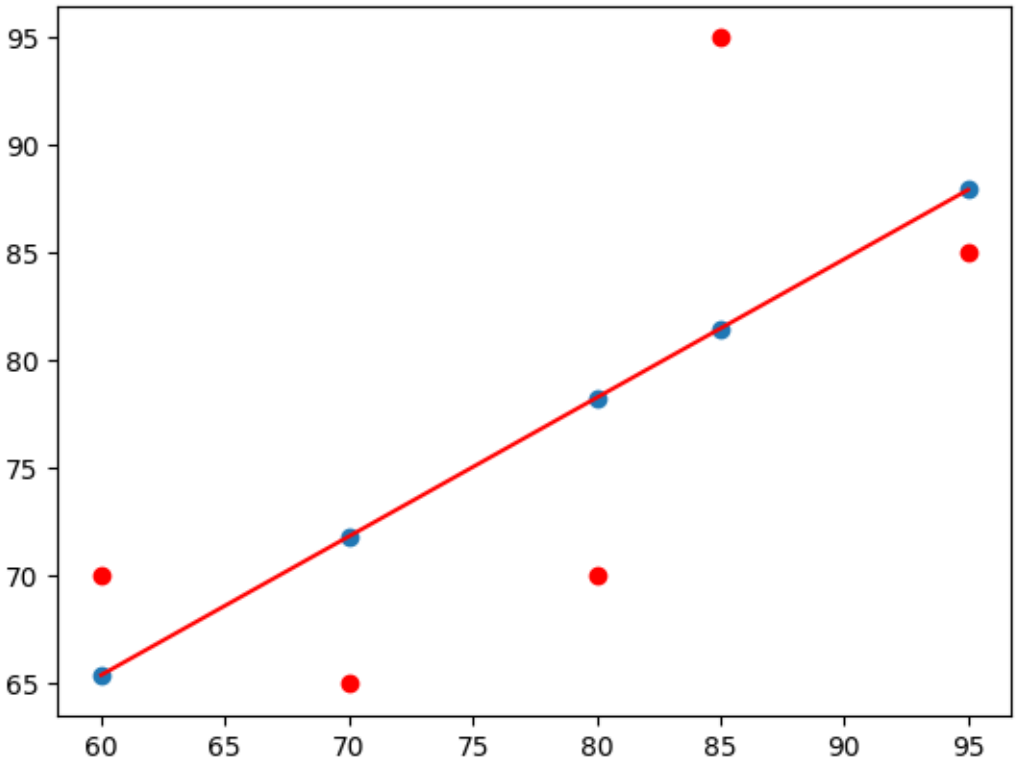
[ ]:
```
array([87.94520548, 81.50684932, 78.28767123, 71.84931507, 65.4109589 ])
```

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

[ ]:
```
0.4803218090889323
```

[ ]:
```
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')
```

[ ]:
```
<matplotlib.collections.PathCollection at 0x7b6c7f063010>
```



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

[ ]:
```
from sklearn.datasets import fetch_california_housing
housing = fetch_california_housing()
```

[ ]:
```
data = pd.DataFrame(housing.data)
```

[ ]:
```
data.columns = housing.feature_names
data.head()
```

[ ]:

	MedInc	HouseAge	AveRooms	AveBedrms	Population	AveOccup	Latitude	Longitude
0	8.3252	41.0	6.984127	1.023810	322.0	2.555556	37.88	-122.23
1	8.3014	21.0	6.238137	0.971880	2401.0	2.109842	37.86	-122.22
2	7.2574	52.0	8.288136	1.073446	496.0	2.802260	37.85	
3	5.6431	52.0	5.817352	1.073059	558.0	2.547945	37.85	
4	3.8462	52.0	6.281853	1.081081	565.0	2.181467	37.85	

```
2    -122.24
3    -122.25
4    -122.25
```

[ ]:
```
data['PRICE'] = housing.target
```

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

[ ]:
```
MedInc        0
HouseAge      0
AveRooms      0
AveBedrms     0
Population    0
AveOccup      0
Latitude      0
Longitude     0
PRICE         0
dtype: int64
```

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

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

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

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

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

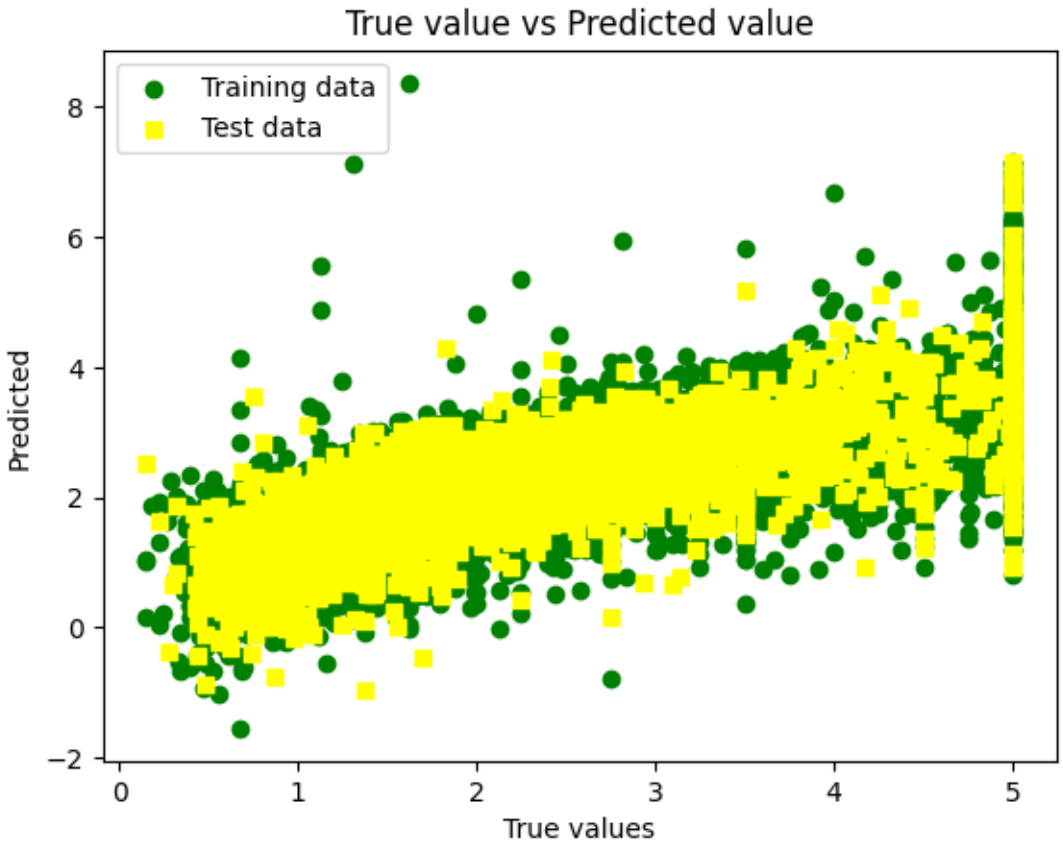
[ ]:
```
from sklearn.metrics import mean_squared_error, r2_score
mse = mean_squared_error(ytest, ytest_pred)
print(mse)
mse = mean_squared_error(ytrain_pred,ytrain)
print(mse)
```

```
0.5289841670367209
0.5234413607125448
```

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

```
0.5289841670367209
```

[ ]:
```
plt.scatter(ytrain ,ytrain_pred,c='green',marker='o',label='Training data')
plt.scatter(ytest,ytest_pred ,c='yellow',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()
```



[ ]:
```

```