

# Decision Tree Regressor

February 17, 2022

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[6]: import pandas as pd
import numpy as np
from sklearn import datasets
from sklearn.model_selection import cross_val_score
from sklearn.tree import DecisionTreeRegressor
```

```
[16]: Boston = datasets.load_boston()
f = pd.DataFrame(Boston.data)
li_ftrs = list(Boston.feature_names)
f.columns = Boston.feature_names
f["PRICES"] = Boston.target
f.head()
```

```
[16]:
```

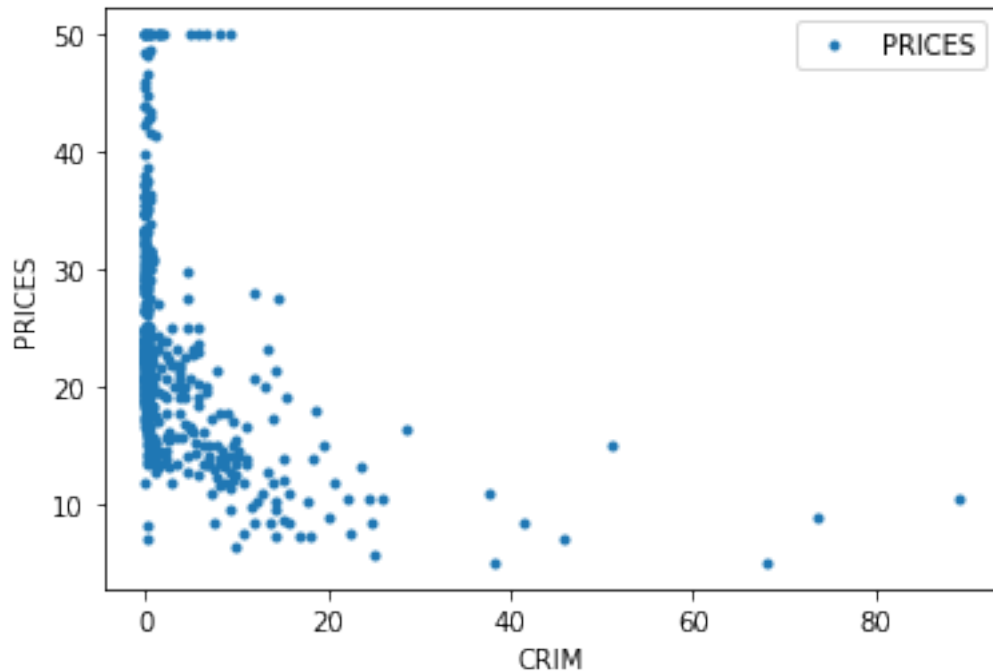
	CRIM	ZN	INDUS	CHAS	NOX	RM	AGE	DIS	RAD	TAX	\
0	0.00632	18.0	2.31	0.0	0.538	6.575	65.2	4.0900	1.0	296.0	
1	0.02731	0.0	7.07	0.0	0.469	6.421	78.9	4.9671	2.0	242.0	
2	0.02729	0.0	7.07	0.0	0.469	7.185	61.1	4.9671	2.0	242.0	
3	0.03237	0.0	2.18	0.0	0.458	6.998	45.8	6.0622	3.0	222.0	
4	0.06905	0.0	2.18	0.0	0.458	7.147	54.2	6.0622	3.0	222.0	

	PTRATIO	B	LSTAT	PRICES
0	15.3	396.90	4.98	24.0
1	17.8	396.90	9.14	21.6
2	17.8	392.83	4.03	34.7
3	18.7	394.63	2.94	33.4
4	18.7	396.90	5.33	36.2

```
[20]: import matplotlib.pyplot as plt    #-- "Matplotlib" for Plotting

f.plot(x="CRIM", y="PRICES", style=".")
plt.ylabel("PRICES")
plt.show()
```



```
[14]: seed = 1363653754754
      rng = np.random.default_rng(seed)
      idx_feat = (np.floor(13*rng.uniform(size=4))).astype(int)
      idx_feat
```

```
[14]: array([9, 2, 3, 9])
```

```
[27]: def tree_reg(x):
      rng = np.random.default_rng(x)
      idx_feat = (np.floor(13*rng.uniform(size=4))).astype(int)
      X = Boston["data"][:,idx_feat]
      label = Boston["feature_names"][idx_feat]
      Y = Boston["target"]
      model = DecisionTreeRegressor(max_depth=10).fit(X,Y)
      selected_features = [li_ftrs[index] for index in idx_feat]
      print(selected_features)
      score = model.score(X, Y)
      print(score)
```

```
[29]: lst = []
      n = int(input("Enter number of elements : "))
      for i in range(0, n):
          ele = int(input())

          lst.append(ele)
```

```
print(lst)
for i in range(len(lst)):
    tree_reg(i)
```

Enter number of elements : 4

123

19009

1234

12334

[123, 19009, 1234, 12334]

['RAD', 'CHAS', 'CRIM', 'CRIM']

0.8479160752420845

['AGE', 'LSTAT', 'ZN', 'LSTAT']

0.965272327514767

['CHAS', 'CHAS', 'PTRATIO', 'ZN']

0.5636683483236726

['ZN', 'CHAS', 'PTRATIO', 'DIS']

0.8738190682803836

[ ]: