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Assigment Day 2 : KKN Pipelines Date 12/12/2022

https://github.com/ijazkhan101/Machine-Learning-with-Python

```
import matplotlib.pylab as plt
from sklearn.metrics import mean_squared_error
from sklearn.datasets import load_boston
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.neighbors import KNeighborsRegressor

X,y = load_boston(return_X_y=True)
```

KNN

```
pipe =Pipeline([("scaler:",StandardScaler()),
("Algo",KNeighborsRegressor())])

pipe
```

```
Pipeline(steps=[('scaler:', StandardScaler()), ('Algo',
KNeighborsRegressor())])
```

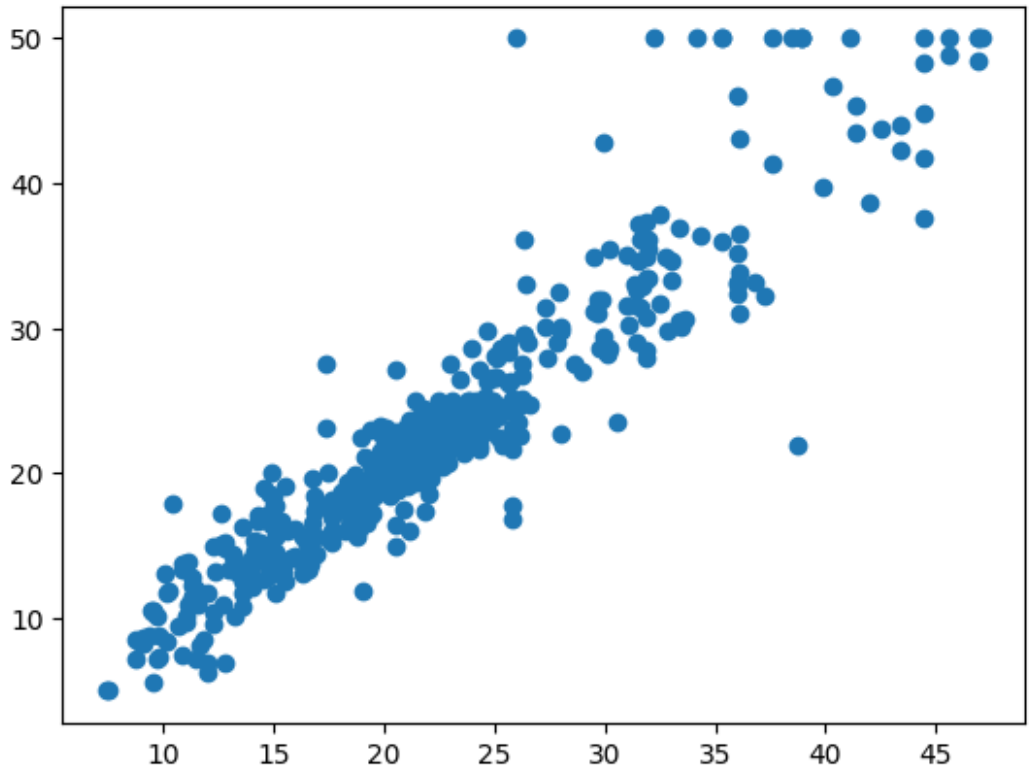
```
pipe.fit(X,y)
```

```
Pipeline(steps=[('scaler:', StandardScaler()), ('Algo',
KNeighborsRegressor())])
```

```
predicted_y=pipe.predict(X)

plt.scatter(predicted_y,y)
```

```
<matplotlib.collections.PathCollection at 0x212bfde8160>
```



2nd Assigment RandomizedSearchCV

```
import matplotlib.pylab as plt
from sklearn.linear_model import LinearRegression
from sklearn.datasets import load_boston
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.model_selection import RandomizedSearchCV
from sklearn.neighbors import KNeighborsRegressor
from scipy.stats import uniform
import warnings
warnings.filterwarnings('ignore')

X,y = load_boston(return_X_y=True)

pipe =Pipeline([
    ('scaler',StandardScaler()),
    ("algo",KNeighborsRegressor())]
)

pipe.get_params()

{'memory': None,
 'steps': [('scaler', StandardScaler()), ('algo',
KNeighborsRegressor())],
 'verbose': False,
 'scaler': StandardScaler(),
 'algo': KNeighborsRegressor(),
```

```
 'scaler__copy': True,
 'scaler__with_mean': True,
 'scaler__with_std': True,
 'algo__algorithm': 'auto',
 'algo__leaf_size': 30,
 'algo__metric': 'minkowski',
 'algo__metric_params': None,
 'algo__n_jobs': None,
 'algo__n_neighbors': 5,
 'algo__p': 2,
 'algo__weights': 'uniform'}
```

```
# using RandomizedSearchCV
model =RandomizedSearchCV(
    estimator=pipe,
    param_distributions ={'algo__n_neighbors':
[1,2,3,4,5,6,7,8,9,10]},
    cv=5
)

model
```

```
RandomizedSearchCV(cv=5,
                   estimator=Pipeline(steps=[('scaler',
StandardScaler()),
                                             ('algo',
KNeighborsRegressor())]),
                   param_distributions={'algo__n_neighbors': [1, 2, 3,
4, 5, 6,
                                                              7, 8, 9,
10]})
```

```
model.fit(X, y)
```

```
RandomizedSearchCV(cv=5,
                   estimator=Pipeline(steps=[('scaler',
StandardScaler()),
                                             ('algo',
KNeighborsRegressor())]),
                   param_distributions={'algo__n_neighbors': [1, 2, 3,
4, 5, 6,
                                                              7, 8, 9,
10]})
```

```
model.predict(X)
```

```
array([25.96666667, 23.02222222, 32.57777778, 28.26666667,
30.42222222,
       26.51111111, 21.63333333, 19.31111111, 18.63333333,
20.16666667,
       19.31111111, 20.6       , 20.85555556, 19.2       ,
18.26666667,
```

```
       19.74444444, 21.86666667, 17.08888889, 20.24444444,
18.76666667,
       14.96666667, 17.21111111, 15.47777778, 15.37777778,
15.57777778,
       15.26666667, 16.08888889, 14.96666667, 17.4       ,
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13.83333333,
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30.47777778,
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20.05555556,
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22.8       ,
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29.43333333,
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19.2       ,
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19.62222222,
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19.52222222,
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18.84444444,
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16.38888889,
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16.56666667,
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16.73333333,
```

```
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24.91111111,
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28.02222222,
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40.57777778,
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26.1       ,
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24.44444444,
       23.22222222, 21.66666667, 21.84444444, 24.87777778,
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37.05555556,
       37.18888889, 37.77777778, 41.41111111, 37.77777778,
37.05555556,
```

```
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31.35555556,
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29.27777778,
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26.25555556,
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21.24444444,
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10.36666667,
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13.01111111,
```

```
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13.33333333,
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11.06666667,
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9.46666667,
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10.35555556,
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11.13333333,
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11.81111111,
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13.        ,
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13.16666667,
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13.47777778,
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14.94444444,
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11.32222222,
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18.21111111,
       15.7       , 18.68888889, 17.87777778, 19.42222222,
20.28888889,
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20.57777778,
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21.55555556,
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20.85555556,
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13.53333333,
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20.93333333,
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19.42222222,
       18.98888889, 21.94444444, 19.23333333, 21.93333333,
21.73333333,
       19.14444444])

import pandas as pd
pd.DataFrame(model.cv_results_)
```

```
   mean_fit_time  std_fit_time  mean_score_time  std_score_time  \
0       0.004998      0.002531         0.004200        0.001166
1       0.007800      0.004400         0.011601        0.010052
2       0.007598      0.005315         0.011001        0.010899
3       0.004597      0.001622         0.010401        0.008593
4       0.023999      0.022564         0.007799        0.002786
5       0.009199      0.003430         0.008600        0.007735
6       0.007000      0.004427         0.012601        0.009457
7       0.007597      0.002155         0.016400        0.005678
8       0.006799      0.002317         0.007404        0.002503
9       0.004399      0.001198         0.004599        0.001498

  param_algo__n_neighbors                    params
split0_test_score  \
0                       1   {'algo__n_neighbors': 1}
0.339313
1                       2   {'algo__n_neighbors': 2}
0.441649
2                       3   {'algo__n_neighbors': 3}
0.520304
3                       4   {'algo__n_neighbors': 4}
0.547088
4                       5   {'algo__n_neighbors': 5}
0.560895
5                       6   {'algo__n_neighbors': 6}
0.582450
6                       7   {'algo__n_neighbors': 7}
0.602434
7                       8   {'algo__n_neighbors': 8}
0.615090
8                       9   {'algo__n_neighbors': 9}
0.625314
9                      10  {'algo__n_neighbors': 10}
0.614446

   split1_test_score  split2_test_score  split3_test_score
split4_test_score  \
0           0.423779           0.534566           0.486373          -
1.623928
1           0.547962           0.474980           0.496794          -
0.548699
2           0.593339           0.547746           0.513891
0.002980
3           0.606925           0.509770           0.490452
0.211278
4           0.619174           0.486619           0.469869
0.231330
5           0.621194           0.509111           0.446859
0.250417
6           0.636185           0.516102           0.442088
```

0.245749
7 0.631185 0.551340 0.440117
0.239072
8 0.630621 0.564464 0.429107
0.279376
9 0.652489 0.555555 0.420648
0.261128

	mean_test_score	std_test_score	rank_test_score
0	0.032020	0.830549	10
1	0.282537	0.417052	9
2	0.435652	0.218139	8
3	0.473103	0.136807	7
4	0.473577	0.132431	6
5	0.482006	0.130434	5
6	0.488512	0.139022	4
7	0.495361	0.144674	3
8	0.505776	0.134503	1
9	0.500853	0.143381	2