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ML practice

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Files

sample\_data

HR\_comma\_sep.csv

heart\_disease.csv

+ Code + Text

[51] y.score(x\_test,y\_test)

0.9777777777777777

s=y.predict(x\_test)

s

array([0, 1, 1, 1, 1, 1, 0, 2, 0, 0, 0, 1, 2, 0, 0, 1, 1, 2, 0, 1, 0, 1, 2, 1, 2, 0, 2, 1, 0, 2, 0, 2, 2, 0, 0, 2, 2, 0, 1, 2, 1, 2, 1, 1, 2])

[56] from sklearn.metrics import confusion\_matrix

r=confusion\_matrix(y\_test,s)

r

array([[15, 0, 0],  
[ 0, 15, 0],  
[ 0, 1, 14]])

[57] import seaborn as sns

f=sns.heatmap(r,annot=True)

f

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```
import pandas as pd
r = pd.DataFrame([ 0, 15, 0],
                 [ 0, 1, 14])

import seaborn as sns
f=sns.heatmap(r,annot=True)
f
```

<Axes: >

	0	1	14
0	15	0	0
1	0	15	0

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Files

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- HR\_comma\_sep.csv
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```
import pandas as pd
a=pd.read_csv('heart_disease.csv')
a
```

rtSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalentHyp	diabetes	totChol	sysBP	diaBP	BMI	heartRate	glucose	Heart_stroke
0	0.0	0.0	no	0	0	195.0	106.0	70.0	26.97	80.0	77.0	No
0	0.0	0.0	no	0	0	250.0	121.0	81.0	28.73	95.0	76.0	No
1	20.0	0.0	no	0	0	245.0	127.5	80.0	25.34	75.0	70.0	No
1	30.0	0.0	no	1	0	225.0	150.0	95.0	28.58	65.0	103.0	yes
1	23.0	0.0	no	0	0	285.0	130.0	84.0	23.10	85.0	85.0	No
...	...	...	...	...	...	...	...	...	...	...	...	...
1	1.0	0.0	no	1	0	313.0	179.0	92.0	25.97	66.0	86.0	yes
1	43.0	0.0	no	0	0	207.0	126.5	80.0	19.71	65.0	68.0	No
1	20.0	NaN	no	0	0	248.0	131.0	72.0	22.00	84.0	86.0	No
1	15.0	0.0	no	0	0	210.0	126.5	87.0	19.16	86.0	NaN	No

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b=a.drop(['Gender','age','education','prevalentStroke','Heart\_stroke','heartRate'],axis=1)  
b

	currentSmoker	cigsPerDay	BPMeds	prevalentHyp	diabetes	totChol	sysBP	diaBP	BMI	glucose
0	0	0.0	0.0	0	0	195.0	106.0	70.0	26.97	77.0
1	0	0.0	0.0	0	0	250.0	121.0	81.0	28.73	76.0
2	1	20.0	0.0	0	0	245.0	127.5	80.0	25.34	70.0
3	1	30.0	0.0	1	0	225.0	150.0	95.0	28.58	103.0
4	1	23.0	0.0	0	0	285.0	130.0	84.0	23.10	85.0
...	...	...	...	...	...	...	...	...	...	...
4233	1	1.0	0.0	1	0	313.0	179.0	92.0	25.97	86.0
4234	1	43.0	0.0	0	0	207.0	126.5	80.0	19.71	68.0
4235	1	20.0	NaN	0	0	248.0	131.0	72.0	22.00	86.0
4236	1	15.0	0.0	0	0	240.0	128.5	87.0	19.18	NaN

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b.isnull().sum()

currentSmoker	0
cigsPerDay	29
BPMeds	53
prevalentHyp	0
diabetes	0
totChol	50
sysBP	0
diaBP	0
BMI	19
glucose	388

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Code

```
glucose 388
```

```
dtype: int64
```

```
b.fillna(b.mean(),inplace=True)
```

```
b
```

	currentSmoker	cigsPerDay	BPMeds	prevalentHyp	diabetes	totChol	sysBP	diaBP	BMI	glucose
0	0	0.0	0.00000	0	0	195.0	106.0	70.0	26.97	77.000000
1	0	0.0	0.00000	0	0	250.0	121.0	81.0	28.73	76.000000
2	1	20.0	0.00000	0	0	245.0	127.5	80.0	25.34	70.000000
3	1	30.0	0.00000	1	0	225.0	150.0	95.0	28.58	103.000000
4	1	23.0	0.00000	0	0	285.0	130.0	84.0	23.10	85.000000
...	...	...	...	...	...	...	...	...	...	...
4233	1	1.0	0.00000	1	0	313.0	179.0	92.0	25.97	86.000000
4234	1	43.0	0.00000	0	0	207.0	126.5	80.0	19.71	68.000000
4235	1	20.0	0.02963	0	0	248.0	131.0	72.0	22.00	86.000000
4236	1	15.0	0.00000	0	0	210.0	126.5	87.0	19.16	81.966753

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```
c=a['heartRate']
```

heartRate	
0	80.0
1	95.0
2	75.0
3	65.0
4	85.0
...	...
4233	68.0
4234	65.0
4235	84.0
4236	86.0

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dtype: float64

[70] c.isnull().sum()

1

c.fillna(c.mean(),inplace=True)

c

heartRate

0	80.0
1	95.0
2	75.0
3	65.0
4	85.0
...	...
4233	66.0
4234	65.0
...	...

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Files

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4238 rows × 1 columns

dtype: float64

```
[81] from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(b,c,test_size=0.2)
```

```
from sklearn.preprocessing import StandardScaler
z=StandardScaler()
y=z.fit_transform(b,c)
y
```

```
array([[ -9.88270765e-01, -7.57974282e-01, -1.75843813e-01, ...,
        -1.08262515e+00,  2.86942730e-01, -2.17516559e-01],
       [-9.88270765e-01, -7.57974282e-01, -1.75843813e-01, ...,
        -1.58988434e-01,  7.19324994e-01, -2.61311076e-01],
       [ 1.01186844e+00,  9.25835162e-01, -1.75843813e-01, ...,
        -2.42955408e-01, -1.13502208e-01, -5.24078177e-01],
       ...,
       [ 1.01186844e+00,  9.25835162e-01, -2.05902264e-17, ...,
        -9.14691202e-01, -9.34045823e-01,  1.76634093e-01],
       [ 1.01186844e+00,  5.04882801e-01, -1.75843813e-01, ...,
        3.44813411e-01, -1.63175357e+00,  0.00000000e+00],
       [-9.88270765e-01, -7.57974282e-01, -1.75843813e-01, ...,
        0.00000000e+00,  0.00000000e+00,  0.00000000e+00]])
```

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3.44813411e-01, -1.63175357e+00, 0.00000000e+00],  
[-9.88270765e-01, -7.57974282e-01, -1.75843813e-01, ...,  
8.94551412e-03, -1.06425185e+00, 1.09631895e+00]])

[84] from sklearn.linear\_model import LogisticRegression  
g=LogisticRegression()  
h=g.fit(x\_train,y\_train)  
h

/usr/local/lib/python3.10/dist-packages/sklearn/linear\_model/\_logistic.py:469: ConvergenceWarning: lbfgs failed to converge (status  
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.  
  
Increase the number of iterations (max\_iter) or scale the data as shown in:  
<https://scikit-learn.org/stable/modules/preprocessing.html>  
Please also refer to the documentation for alternative solver options:  
[https://scikit-learn.org/stable/modules/linear\\_model.html#logistic-regression](https://scikit-learn.org/stable/modules/linear_model.html#logistic-regression)  
n\_iter\_i = check\_optimize\_result(  
+ LogisticRegression  
LogisticRegression())

[90] h.score(x\_test,y\_test)

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```
LogisticRegression
LogisticRegression()

h.score(x_test,y_test)

-----
ValueError                                Traceback (most recent call last)
<ipython-input-90-ee47fb5b786a> in <cell line: 1>()
----> 1 h.score(x_test,y_test)

3 frames
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py in _check_targets(y_true, y_pred)
    110
    111     if len(y_type) > 1:
--> 112         raise ValueError(
    113             "Classification metrics can't handle a mix of {0} and {1} targets".format(
    114                 type_true, type_pred

ValueError: Classification metrics can't handle a mix of continuous and multiclass targets

[87] j-h.predict(x_test)
1
```

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```
15., 15., 15., 15., 15., 15., 15., 15., 15., 80., 15., 15., 15.,
75., 75., 75., 75., 75., 75., 75., 75., 75., 75., 75., 75.,
75., 75., 75., 75., 75., 75., 75., 75., 75., 75., 75., 75.,
75., 75., 75.]

from sklearn.metrics import confusion_matrix
k=confusion_matrix(y_test,j)
k

-----
ValueError                                Traceback (most recent call last)
<ipython-input-89-4b9b218f1a67> in <cell line: 2>()
      1 from sklearn.metrics import confusion_matrix
----> 2 k=confusion_matrix(y_test,j)
      3 k

----- 2 frames -----
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py in _check_targets(y_true, y_pred)
    110
    111     if len(y_type) > 1:
--> 112         raise ValueError(
    113             "Classification metrics can't handle a mix of {0} and {1} targets".format(
    114                 type_true, type_pred
            )
        )

ValueError: Classification metrics can't handle a mix of continuous and multiclass targets
```

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Code

```
ValueError: Classification metrics can't handle a mix of continuous and multiclass targets
```

```
from sklearn.datasets import load_digits
digits=load_digits()
digits
```

```
{'data': array([[ 0.,  0.,  5., ...,  0.,  0.,  0.],
 [ 0.,  0.,  0., ..., 10.,  0.,  0.],
 [ 0.,  0.,  0., ..., 16.,  9.,  0.],
 ...,
 [ 0.,  0.,  1., ...,  6.,  0.,  0.],
 [ 0.,  0.,  2., ..., 12.,  0.,  0.],
 [ 0.,  0., 10., ..., 12.,  1.,  0.]])
, 'target': array([0, 1, 2, ..., 8, 9, 8])
, 'Frame': None
, 'feature_names': ['pixel_0_0',
 'pixel_0_1',
 'pixel_0_2',
 'pixel_0_3',
 'pixel_0_4',
 'pixel_0_5',
 'pixel_0_6',
 'pixel_0_7',
 'pixel_1_0',
 'pixel_1_1',
 ...]}
```

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Code

```
[ 0.,  0., 13., ..., 15.,  5.,  0.],  
[ 0.,  3., 15., ..., 11.,  8.,  0.],
```

```
[95] a=digits.data  
      b=digits.target
```

```
[96] from sklearn.model_selection import train_test_split  
      x_train,x_test,y_train,y_test=train_test_split(a,b,test_size=0.2)
```

```
[98] from sklearn.svm import SVC  
      z=SVC()  
      y=z.fit(x_train,y_train)  
      y
```

SVC

```
[99] y.score(x_test,y_test)
```

0.9916666666666667

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```
[101] z=SVC(kernel='rbf')
      y=z.fit(x_train,y_train)
      y
      y.score(x_test,y_test)
      0.9916666666666667

[102] z=SVC(kernel='linear')
      y=z.fit(x_train,y_train)
      y
      y.score(x_test,y_test)
      0.9638888888888889

[ ] z=SVC(kernel='rbf')
    y=z.fit(x_train,y_train)
    y
    y.score(x_test,y_test)

[103] z=SVC(gamma=1)
      y=z.fit(x_train,y_train)
```

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```
y
y.score(x_test,y_test)
0.9638888888888889

f=SVC(gamma=1)
y=z.fit(x_train,y_train)
y
y.score(x_test,y_test)
0.08888888888888889

z=SVC(gamma=10)
y=z.fit(x_train,y_train)
y
y.score(x_test,y_test)
0.08888888888888889
```

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