Vijay 02-09-2023

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

In [153]:
```
from sklearn.linear_model import LogisticRegression
a=pd.read_csv(r"C:\USERS\user\Downloads\C4_framingham.csv")
a
```

0	1	39	4.0	0	0.0	0.0	0
1	0	46	2.0	0	0.0	0.0	0
2	1	48	1.0	1	20.0	0.0	0
3	0	61	3.0	1	30.0	0.0	0
4	0	46	3.0	1	23.0	0.0	0
...	...	...	...	...	...	...	...
4233	1	50	1.0	1	1.0	0.0	0
4234	1	51	3.0	1	43.0	0.0	0
4235	0	48	2.0	1	20.0	NaN	0
4236	0	44	1.0	1	15.0	0.0	0
4237	0	52	2.0	0	0.0	0.0	0

4238 rows × 16 columns

In [154]:
```
from sklearn.linear_model import LogisticRegression
```

In [200]:
```
a=a.head(100)
a
```

Out[200]:

	male	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalentHyp	di
0	1	39	4.0	0	0.0	0.0	0	0	
1	0	46	2.0	0	0.0	0.0	0	0	
2	1	48	1.0	1	20.0	0.0	0	0	
3	0	61	3.0	1	30.0	0.0	0	1	
4	0	46	3.0	1	23.0	0.0	0	0	
5	0	43	2.0	0	0.0	0.0	0	1	
6	0	63	1.0	0	0.0	0.0	0	0	
7	0	45	2.0	1	20.0	0.0	0	0	
8	1	52	1.0	0	0.0	0.0	0	1	
9	1	43	1.0	1	30.0	0.0	0	1	

In [201]:
```
a.columns
```

Out[201]:
```
Index(['male', 'age', 'education', 'currentSmoker', 'cigsPerDay', 'BPMeds',
       'prevalentStroke', 'prevalentHyp', 'diabetes', 'totChol', 'sysBP',
       'diaBP', 'BMI', 'heartRate', 'glucose', 'TenYearCHD'],
      dtype='object')
```

In [202]:
```
b=a[['male', 'age', 'education', 'currentSmoker', 'cigsPerDay', 'BPMeds',
       'prevalentStroke', 'prevalentHyp', 'diabetes', 'totChol', 'sysBP',
       'diaBP', 'BMI', 'heartRate', 'glucose', 'TenYearCHD']]
b
```

Out[202]:

	male	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalentHyp	di
0	1	39	4.0	0	0.0	0.0	0	0	
1	0	46	2.0	0	0.0	0.0	0	0	
2	1	48	1.0	1	20.0	0.0	0	0	
3	0	61	3.0	1	30.0	0.0	0	1	
4	0	46	3.0	1	23.0	0.0	0	0	
5	0	43	2.0	0	0.0	0.0	0	1	
6	0	63	1.0	0	0.0	0.0	0	0	
7	0	45	2.0	1	20.0	0.0	0	0	
8	1	52	1.0	0	0.0	0.0	0	1	
9	1	43	1.0	1	30.0	0.0	0	1	

In [203]:
```
c=b.iloc[:,0:15]
d=b.iloc[:,-1]
```

In [204]:
```
c.shape
```

Out[204]: (10, 15)

In [205]:
```
d.shape
```

Out[205]: (10,)

In [ ]:
```

```

In [206]:
```
from sklearn.preprocessing import StandardScaler
fs=StandardScaler().fit_transform(c)
fs
```

Out[206]:
```
array([[ 1.22474487, -1.28931674,  2.        , -1.        , -0.96754461,
         0.        ,  0.        , -0.81649658,  0.        , -1.41062997,
        -1.27734618, -1.15306967,  0.05752806,  0.14484136, -0.70928138],
       [-0.81649658, -0.34918995,  0.        , -1.        , -0.96754461,
         0.        ,  0.        , -0.81649658,  0.        ,  0.20235648,
        -0.63004237, -0.35029965,  0.58486866,  1.59325501, -0.8106073 ],
       [ 1.22474487, -0.0805823 , -1.        ,  1.        ,  0.60569866,
         0.        ,  0.        , -0.81649658,  0.        ,  0.05572135,
        -0.34954405, -0.42327874, -0.43086123, -0.33796318, -1.41856277],
       [-0.81649658,  1.66536746,  1.        ,  1.        ,  1.39232029,
         0.        ,  0.        ,  1.22474487,  0.        , -0.53081918,
         0.62141165,  0.67140766,  0.53992486, -1.30357228,  1.92519233],
       [-0.81649658, -0.34918995,  1.        ,  1.        ,  0.84168515,
         0.        ,  0.        , -0.81649658,  0.        ,  1.22880241,
        -0.24166009, -0.13136237, -1.10202199,  0.62764591,  0.10132591],
       [-0.81649658, -0.75210143,  0.        , -1.        , -0.96754461,
         0.        ,  0.        ,  1.22474487,  0.        , -0.4428381 ,
         1.91601926,  1.76609405,  1.05528044, -0.14484136,  1.51988868],
       [-0.81649658,  1.93397511, -1.        , -1.        , -0.96754461,
         0.        ,  0.        , -0.81649658,  0.        , -1.11735971,
         0.10356861, -1.08009058,  1.89722763, -1.78637683,  0.10132591],
       [-0.81649658, -0.48349378,  0.        ,  1.        ,  0.60569866,
         0.        ,  0.        , -0.81649658,  0.        ,  2.04995915,
        -1.5362677 , -1.08009058, -1.52748997,  0.04828045, -0.60795547],
       [ 1.22474487,  0.45663301, -1.        , -1.        , -0.96754461,
         0.        ,  0.        ,  1.22474487,  0.        ,  0.49562675,
         0.25460616,  0.2335331 , -0.12524339, -0.24140227, -0.50662956],
       [ 1.22474487, -0.75210143, -1.        ,  1.        ,  1.39232029,
         0.        ,  0.        ,  1.22474487,  0.        , -0.53081918,
         1.1392547 ,  1.54715677, -0.94921307,  1.40013319,  0.40530365]])
```

In [207]:
```
logr=LogisticRegression()
logr.fit(fs,d)
```

Out[207]: LogisticRegression()

In [208]:
```
e=[[2,5,77,8,5,2.3,5.2,1,1.2,16,56,52,45,25,65]]
```

In [209]:
```
prediction=logr.predict(e)
prediction
```

Out[209]:
```
array([1], dtype=int64)
```

In [210]:
```
logr.classes_
```

Out[210]:
```
array([0, 1], dtype=int64)
```

In [211]:
```
logr.predict_proba(e)[0][0]
```

Out[211]:
```
1.9817379515174594e-08
```

In [212]:
```
import re
from sklearn.datasets import load_digits
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [213]:
```
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
```

In [214]:
```
digits=load_digits()
digits
```

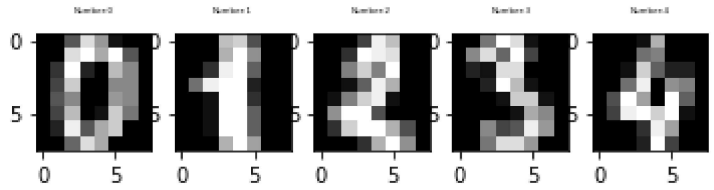
```
'pixel_4_3',
'pixel_4_4',
'pixel_4_5',
'pixel_4_6',
'pixel_4_7',
'pixel_5_0',
'pixel_5_1',
'pixel_5_2',
'pixel_5_3',
'pixel_5_4',
'pixel_5_5',
'pixel_5_6',
'pixel_5_7',
'pixel_6_0',
'pixel_6_1',
'pixel_6_2',
'pixel_6_3',
'pixel_6_4',
'pixel_6_5',
'pixel_6_6',
```

In [215]:
```
plt.figure(figsize=(20,4))
```

Out[215]:
```
<Figure size 1440x288 with 0 Axes>

<Figure size 1440x288 with 0 Axes>
```

In [216]:
```
for index,(image,label) in enumerate(zip(digits.data[0:5],digits.target[0:
    plt.subplot(1,5,index+1)
    plt.imshow(np.reshape(image,(8
                                 ,8)),cmap=plt.cm.gray)
    plt.title('Number:%i\n'%label,fontsize=4)
```



In [217]:
```
x_train,x_test,y_train,y_test=train_test_split(digits.data,digits.target,t
```

In [218]:
```
print(x_train.shape)
print(x_test.shape)
print(y_train.shape)
print(y_test.shape)
```

```
(1257, 64)
(540, 64)
(1257,)
(540,)
```

In [219]:
```
logre=LogisticRegression(max_iter=10000)
logre.fit(x_train,y_train)

```

Out[219]:
```
LogisticRegression(max_iter=10000)
```

In [220]:
```
print(logre.predict(x_test))
```

```
[6 6 9 4 3 3 9 1 3 6 0 6 5 9 8 7 0 8 3 7 1 0 6 4 4 8 4 1 9 4 1 6 9 8 3 4 9
 1 4 3 1 9 0 1 6 2 6 5 3 0 0 1 5 2 7 4 3 1 2 7 0 1 4 0 1 5 5 7 1 9 7 9 2 9
 2 6 7 4 2 5 8 9 1 5 5 2 1 3 1 3 7 2 7 5 3 9 0 9 3 0 4 0 1 2 5 9 6 9 6 7 8
 4 5 6 9 8 9 9 2 5 7 1 2 4 8 8 3 2 9 5 1 2 4 5 1 9 3 2 2 9 9 1 3 5 0 7 3 4
 9 7 8 3 5 9 4 4 8 5 5 0 0 7 9 9 2 8 5 5 2 7 1 3 7 5 7 6 5 0 6 6 8 9 5 5 6
 5 1 8 4 2 3 6 3 4 1 7 4 2 3 3 6 2 2 4 3 6 1 7 2 1 9 8 6 6 5 0 1 0 5 6 2 1
 4 1 6 1 8 3 6 5 9 4 3 3 9 3 1 5 1 4 8 9 6 1 3 9 9 7 0 9 8 6 9 5 8 9 7 7 2
 3 4 1 9 8 6 9 1 3 6 4 1 4 4 9 1 2 7 6 7 3 8 8 9 2 7 6 7 9 9 1 0 7 3 0 2 6
 7 0 5 1 5 3 2 0 3 7 3 5 3 0 4 8 2 8 8 1 2 9 6 3 3 0 7 5 8 5 2 0 8 3 1 5 4
 3 6 0 7 7 4 4 1 5 3 7 1 8 7 7 7 6 4 1 5 1 8 0 9 8 8 2 1 6 1 9 2 2 1 9 1 7
 7 6 4 7 9 2 9 4 0 3 2 4 9 2 4 7 5 9 4 2 3 8 2 1 0 3 3 8 6 5 5 1 7 8 2 4 9
 8 3 4 1 8 0 1 7 7 1 5 8 1 5 4 1 1 8 7 9 6 6 0 2 8 5 2 0 3 7 2 4 8 4 3 2 9
 0 6 6 3 8 1 2 0 1 4 9 9 0 6 1 4 0 7 7 5 6 3 2 9 7 2 9 1 9 1 5 0 9 1 2 6 8
 5 6 0 7 0 7 8 7 2 4 3 7 7 9 1 7 7 5 6 4 2 9 0 5 5 7 7 0 6 4 3 0 4 4 5 0 9
 5 0 4 6 5 0 2 9 8 9 8 5 5 0 7 0 1 5 0 0 2 8]
```

In [221]:
```
1 import numpy as np
2 import pandas as pd
3 import matplotlib.pyplot as plt
4 import seaborn as sns
```

In [222]:
```
1 a=pd.read_csv(r"C:\USERS\user\Downloads\C3_bot_detection_data (1).csv")
```

In [223]:
```
1 a['male'].value_counts()
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\indexes\base.py in get
_loc(self, key, method, tolerance)
   3079             try:
-> 3080                 return self._engine.get_loc(casted_key)
   3081             except KeyError as err:

pandas\_libs\index.pyx in pandas._libs.index.IndexEngine.get_loc()

pandas\_libs\index.pyx in pandas._libs.index.IndexEngine.get_loc()

pandas\_libs\hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHas
hTable.get_item()

pandas\_libs\hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHas
hTable.get_item()

KeyError: 'male'

The above exception was the direct cause of the following exception:

KeyError                                  Traceback (most recent call last)
<ipython-input-223-402aa8144da8> in <module>
----> 1 a['male'].value_counts()

C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\frame.py in __getitem_
_(self, key)
   3022             if self.columns.nlevels > 1:
   3023                 return self._getitem_multilevel(key)
-> 3024             indexer = self.columns.get_loc(key)
   3025             if is_integer(indexer):
   3026                 indexer = [indexer]

C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\indexes\base.py in get
_loc(self, key, method, tolerance)
   3080                 return self._engine.get_loc(casted_key)
   3081             except KeyError as err:
-> 3082                 raise KeyError(key) from err
   3083
   3084         if tolerance is not None:

KeyError: 'male'
```

In [224]:
```
x=b.drop('male',axis=1)
y=b['male']
print(b)
```

```
   male  age  education  currentSmoker  cigsPerDay  BPMeds  prevalentStroke
\
0     1   39        4.0              0         0.0     0.0                0
1     0   46        2.0              0         0.0     0.0                0
2     1   48        1.0              1        20.0     0.0                0
3     0   61        3.0              1        30.0     0.0                0
4     0   46        3.0              1        23.0     0.0                0
5     0   43        2.0              0         0.0     0.0                0
6     0   63        1.0              0         0.0     0.0                0
7     0   45        2.0              1        20.0     0.0                0
8     1   52        1.0              0         0.0     0.0                0
9     1   43        1.0              1        30.0     0.0                0

   prevalentHyp  diabetes  totChol  sysBP  diaBP    BMI  heartRate  glucose
\
0             0         0    195.0  106.0   70.0  26.97       80.0     77.0
1             0         0    250.0  121.0   81.0  28.73       95.0     76.0
2             0         0    245.0  127.5   80.0  25.34       75.0     70.0
3             1         0    225.0  150.0   95.0  28.58       65.0    103.0
4             0         0    285.0  130.0   84.0  23.10       85.0     85.0
5             1         0    228.0  180.0  110.0  30.30       77.0     99.0
6             0         0    205.0  138.0   71.0  33.11       60.0     85.0
7             0         0    313.0  100.0   71.0  21.68       79.0     78.0
8             1         0    260.0  141.5   89.0  26.36       76.0     79.0
9             1         0    225.0  162.0  107.0  23.61       93.0     88.0

   TenYearCHD
0           0
1           0
2           0
3           1
4           0
5           0
6           1
7           0
8           0
9           0
```

In [225]:

```
g1={"Mention Count":{'Mention Count':1,'b':2}}
df=df.replace(g1)
print(df)
```

```
       User ID         Username  \
0       132131            flong
1       289683   hinesstephanie
2       779715       roberttran
3       696168            pmason
4       704441            noah87
...        ...               ...
49995   491196            uberg
49996   739297      jessicamunoz
49997   674475    lynncunningham
49998   167081  richardthompson
49999   311204         daniel29

                                                   Tweet  Retweet Count  \
0      Station activity person against natural majori...             85
1      Authority research natural life material staff...             55
2      Manage whose quickly especially foot none to g...              6
3      Just cover eight opportunity strong policy which.             54
4                          Animal sign six data good or.             26
...                                                  ...            ...
49995  Want but put card direction know miss former h...             64
49996  Provide whole maybe agree church respond most ...             18
49997  Bring different everyone international capital...             43
49998  Than about single generation itself seek sell ...             45
49999  Here morning class various room human true bec...             91

       Mention Count  Follower Count  Verified  Bot Label            Location
\
0                  1            2353     False          1           Adkinston
1                  5            9617      True          0          Sanderston
2                  2            4363      True          0        Harrisonfurt
3                  5            2242      True          1        Martinezberg
4                  3            8438     False          1        Camachoville
...              ...             ...       ...        ...                 ...
49995              0            9911      True          1  Lake Kimberlyburgh
49996              5            9900     False          1           Greenbury
49997              3            6313      True          1         Deborahfort
49998              1            6343     False          0         Stephenside
49999              4            4006     False          0           Novakberg

                Created At                          Hashtags
0      2020-05-11 15:29:50                               NaN
1      2022-11-26 05:18:10                         both live
2      2022-08-08 03:16:54                       phone ahead
3      2021-08-14 22:27:05                ever quickly new I
4      2020-04-13 21:24:21                   foreign mention
...                    ...                               ...
49995  2023-04-20 11:06:26  teach quality ten education any
49996  2022-10-18 03:57:35            add walk among believe
49997  2020-07-08 03:54:08          onto admit artist first
49998  2022-03-22 12:13:44                             star
49999  2022-12-03 06:11:07                             home

[50000 rows x 11 columns]
```

In [226]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,train_size=0.70)
```

In [227]:
```
from sklearn.ensemble import RandomForestClassifier
```

In [228]:
```
rfc=RandomForestClassifier()
rfc.fit(x_train,y_train)
```

Out[228]:
```
RandomForestClassifier()
```

In [229]:
```
parameters={'max_depth':[1,2,3,4,5],
            'min_samples_leaf':[5,10,15,20,25],
            'n_estimators':[10,20,30,40,50]}
```

In [230]:
```
from sklearn.model_selection import GridSearchCV
```

In [231]:
```
grid_search=GridSearchCV(estimator=rfc,param_grid=parameters,cv=2,scoring=
grid_search.fit(x_train,y_train)
```

Out[231]:
```
GridSearchCV(cv=2, estimator=RandomForestClassifier(),
             param_grid={'max_depth': [1, 2, 3, 4, 5],
                         'min_samples_leaf': [5, 10, 15, 20, 25],
                         'n_estimators': [10, 20, 30, 40, 50]},
             scoring='accuracy')
```

In [232]:
```
grid_search.best_score_
```

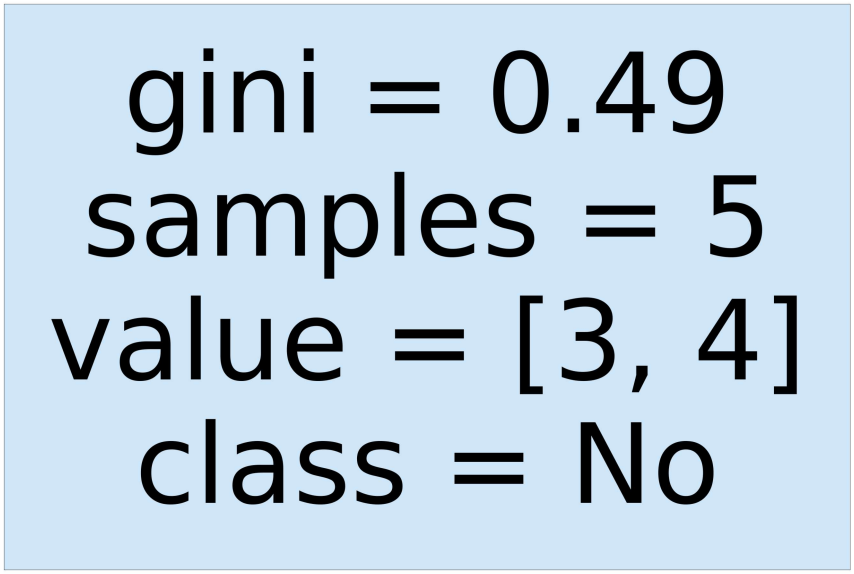
Out[232]:
```
0.5833333333333333
```

In [233]:
```
rfc_best=grid_search.best_estimator_
```

In [234]:
```
from sklearn.tree import plot_tree
```

In [237]:
```
1 plt.figure(figsize=(80,40))
2 plot_tree(rfc_best.estimators_[5],feature_names=x.columns,class_names=['Ye
3
```

Out[237]:
```
[Text(2232.0, 1087.2, 'gini = 0.49\nsamples = 5\nvalue = [3, 4]\nclass = N
o')]
```



In [ ]:
```
1
```