Question8

June 6, 2021

[3]:
```
import pandas as pd
from sklearn.model_selection import train_test_split
import numpy as np
from sklearn.linear_model import LogisticRegression

# read dataset
df = pd.read_csv('wine.data')
print(df.shape)
x = df.iloc[:,1:].to_numpy()
y = df.iloc[:,0].to_numpy()

# split train and test dataset
X_train, X_test, y_train, y_test = train_test_split(x, y, test_size=0.3,␣
 ↪random_state=42)
```

```
(177, 14)
```

[13]:
```
# sum of accuracy
sum_acc1 = 0.0
# build logistic-- no convergence problem: newton-cg, liblinear | have problem:␣
 ↪sage,sag,lbfgs
lr = LogisticRegression(solver='liblinear')
for _ in range(10):
    # train model
    lr.fit(X_train, y_train)
    # cal score of model (accuracy)
    score = lr.score(X_test, y_test)
    sum_acc1=sum_acc1+score
# average of acc
avg_acc = sum_acc1/10
print('average of accuracy using liblinear',avg_acc)
```

```
average of accuracy using liblinear 0.9444444444444444
```

[14]:
```
# sum of accuracy
sum_acc2 = 0.0
lr = LogisticRegression(solver='newton-cg')
for _ in range(10):
```

```
    # train model
    lr.fit(X_train, y_train)
    # cal score of model (accuracy)
    score = lr.score(X_test, y_test)
    sum_acc2=sum_acc2+score
# average of acc
avg_acc = sum_acc2/10
print('average of accuracy using newton-cg',avg_acc)
```

```
average of accuracy using newton-cg 0.9444444444444444
```