Assignment - 5

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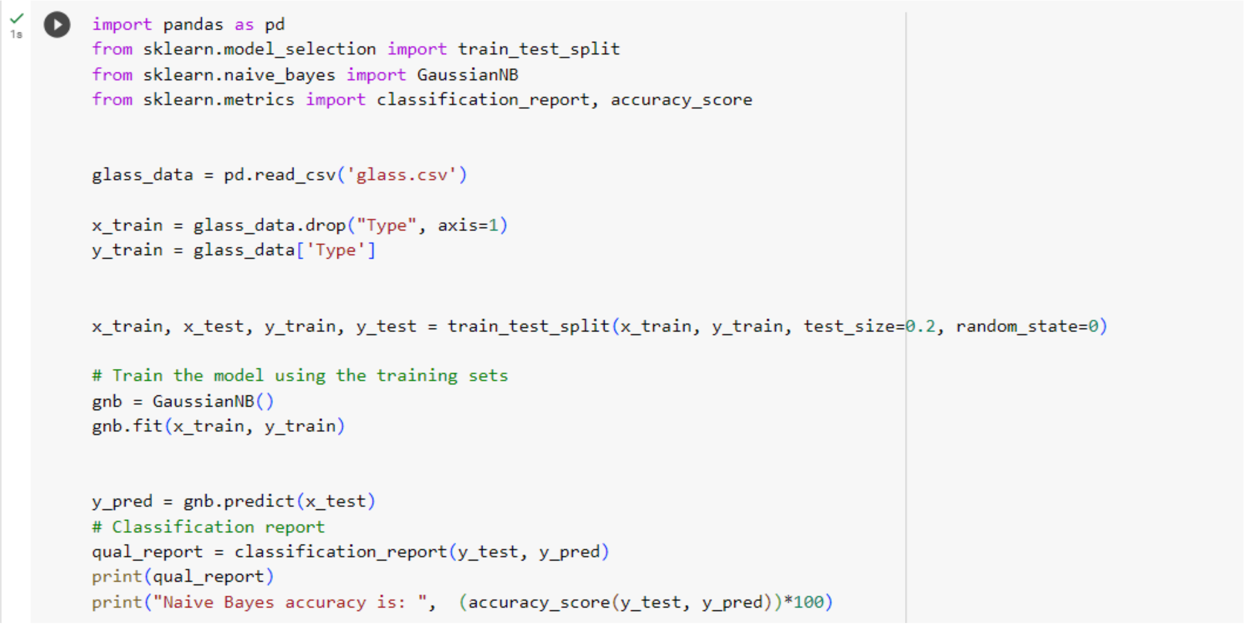
Video link : https://drive.google.com/drive/my-drive

GitHub link : https://github.com/NavyaBonthu/ICP5

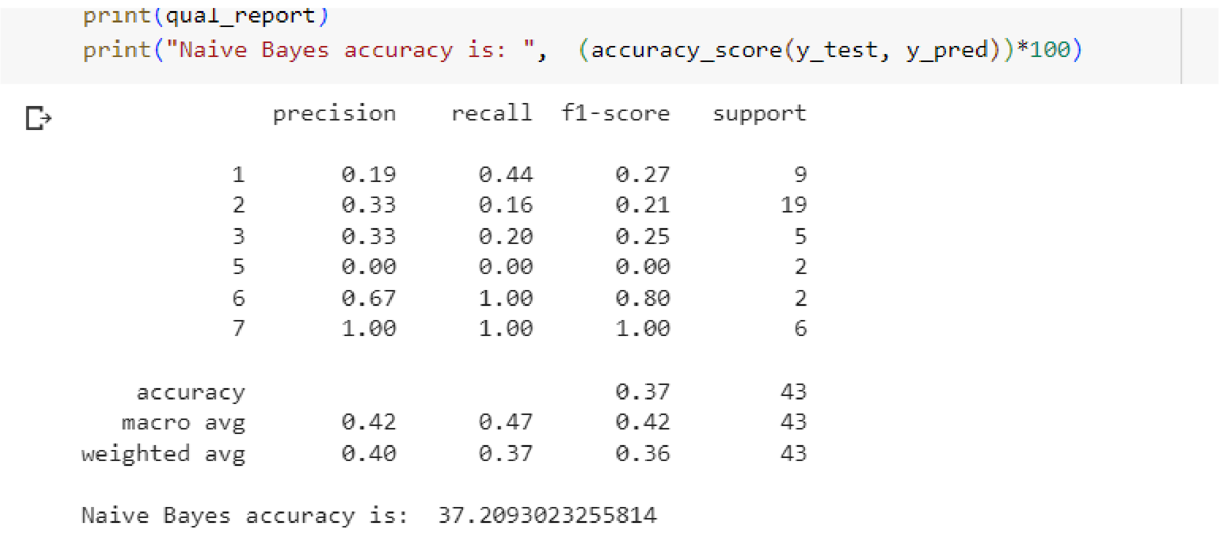
1. Implement Naïve Bayes method using scikit-learn library
   Use dataset available with name glass
   Use train_test_split to create training and testing part
   Evaluate the model on test part using score and classification_report(y_true, y_pred)

Code:



```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import GaussianNB
from sklearn.metrics import classification_report, accuracy_score


glass_data = pd.read_csv('glass.csv')

x_train = glass_data.drop("Type", axis=1)
y_train = glass_data['Type']


x_train, x_test, y_train, y_test = train_test_split(x_train, y_train, test_size=0.2, random_state=0)

# Train the model using the training sets
gnb = GaussianNB()
gnb.fit(x_train, y_train)


y_pred = gnb.predict(x_test)
# Classification report
qual_report = classification_report(y_test, y_pred)
print(qual_report)
print("Naive Bayes accuracy is: ",  (accuracy_score(y_test, y_pred))*100)
```

Output:



```
print(qual_report)
print("Naive Bayes accuracy is: ",  (accuracy_score(y_test, y_pred))*100)
```

```
              precision    recall  f1-score   support

           1       0.19      0.44      0.27         9
           2       0.33      0.16      0.21        19
           3       0.33      0.20      0.25         5
           5       0.00      0.00      0.00         2
           6       0.67      1.00      0.80         2
           7       1.00      1.00      1.00         6

    accuracy                           0.37        43
   macro avg       0.42      0.47      0.42        43
weighted avg       0.40      0.37      0.36        43

Naive Bayes accuracy is:   37.2093023255814
```

2. Implement linear SVM method using scikit library

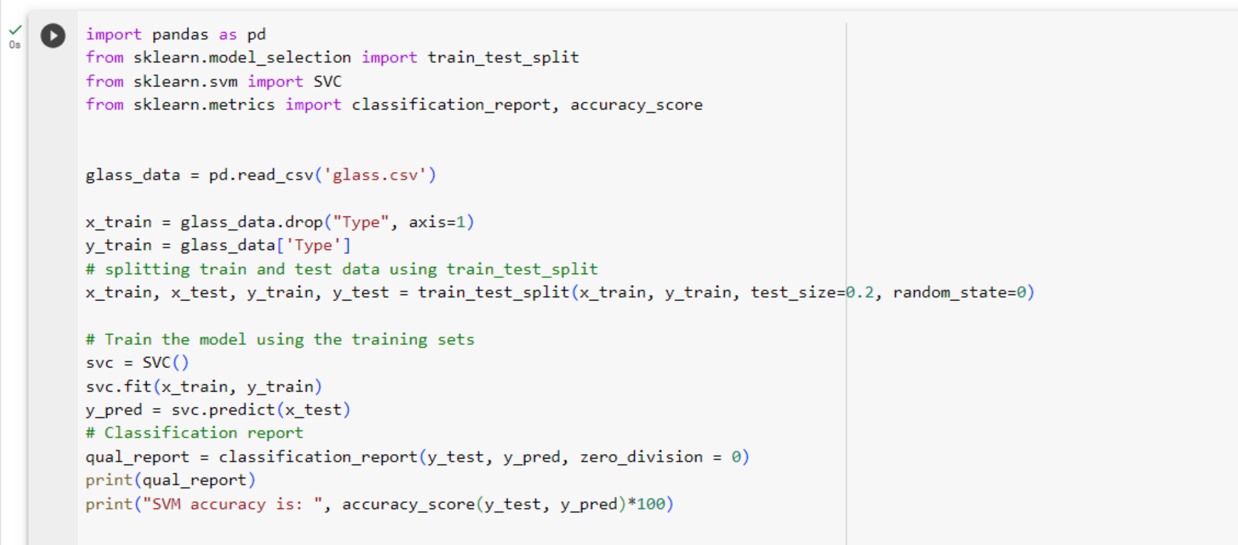
Use the same dataset above

Use train_test_split to create training and testing part

Evaluate the model on test part using score and classification_report(y_true, y_pred)

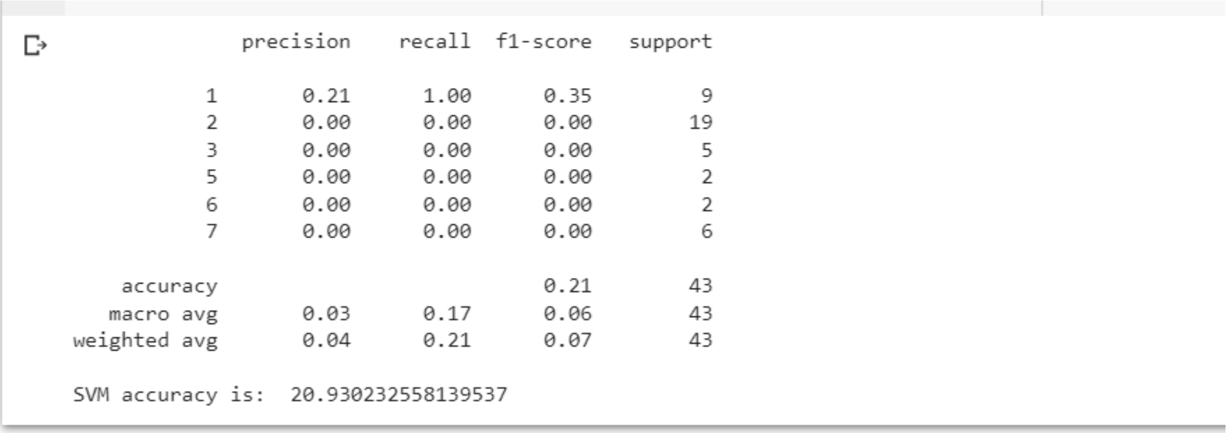
Which algorithm you got better accuracy? Can you justify why?

Code:



```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.metrics import classification_report, accuracy_score


glass_data = pd.read_csv('glass.csv')

x_train = glass_data.drop("Type", axis=1)
y_train = glass_data['Type']
# splitting train and test data using train_test_split
x_train, x_test, y_train, y_test = train_test_split(x_train, y_train, test_size=0.2, random_state=0)

# Train the model using the training sets
svc = SVC()
svc.fit(x_train, y_train)
y_pred = svc.predict(x_test)
# Classification report
qual_report = classification_report(y_test, y_pred, zero_division = 0)
print(qual_report)
print("SVM accuracy is: ", accuracy_score(y_test, y_pred)*100)
```

Output:



```
              precision    recall  f1-score   support

           1       0.21      1.00      0.35         9
           2       0.00      0.00      0.00        19
           3       0.00      0.00      0.00         5
           5       0.00      0.00      0.00         2
           6       0.00      0.00      0.00         2
           7       0.00      0.00      0.00         6

    accuracy                           0.21        43
   macro avg       0.03      0.17      0.06        43
weighted avg       0.04      0.21      0.07        43

SVM accuracy is:  20.930232558139537
```