Model Development Phase Template

Date	12 JULY 2024
ID	740022
Project Title	Lymphography Classification Using ML
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

Initial Model Training Code:

```
[ ]  clf.fit(x_train, y_train)

     # Make predictions on the testing data
     y_pred = clf.predict(x_test)

     # Evaluate the classifier
     report = classification_report(y_test, y_pred)
     print("Classification Report:\n", report)
```

```
Classification Report:
                precision    recall  f1-score   support

           2.0       0.74      1.00      0.85        14
           3.0       1.00      0.64      0.78        14
           4.0       1.00      1.00      1.00         2

      accuracy                           0.83        30
     macro avg       0.91      0.88      0.88        30
  weighted avg       0.88      0.83      0.83        30
```

```
[ ]  1 from sklearn.linear_model import LogisticRegression
     2 from sklearn.metrics import accuracy_score,classification_report,confusion_matrix
```

```
 1 model_lr = LogisticRegression()
 2 model_lr.fit(x_train,y_train)
 3 lr_pred_test=model_lr.predict(x_test)
 4 lr_pred_train=model_lr.predict(x_train)
 5 test_acc_lr=accuracy_score(y_test,lr_pred_test)
 6 train_acc_lr=accuracy_score(y_train,lr_pred_train)
 7 print('Logistic Regression test accuracy: ',test_acc_lr)
 8 print(classification_report(y_test,lr_pred_test))
```

```
Logistic Regression test accuracy:  0.8
              precision    recall  f1-score   support

         2.0       0.71      1.00      0.83        12
         3.0       1.00      0.71      0.83        17
         4.0       0.00      0.00      0.00         1

    accuracy                           0.80        30
   macro avg       0.57      0.57      0.55        30
weighted avg       0.85      0.80      0.80        30
```

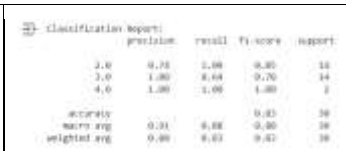
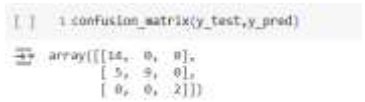
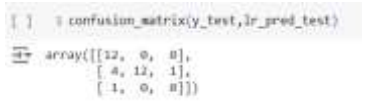
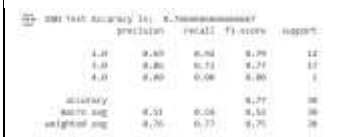
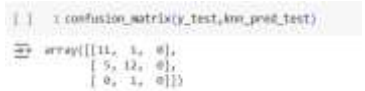
KNN

```
 1 knn_score1 = metrics.accuracy_score(y_train, knn_pred1) * 100
 2 print(knn_score1)
 3 knn_score = metrics.accuracy_score(y_test, knn_pred) * 100
 4
 5 ### Print classification report for regular
 6 print(" ----- Regular Training Set Used ----- ")
 7 print("Classification report for {}:\n{}". format(knn, metrics.classification_report(y_test, knn_pred)))
 8 print("Accuracy score:", knn_score)
```

```
81.35593220338984
 ----- Regular Training Set Used -----
Classification report for KNeighborsClassifier():
              precision    recall  f1-score   support

         2.0       0.87      0.93      0.90        14
         3.0       0.80      0.86      0.83        14
         4.0       0.00      0.00      0.00         2

    accuracy                           0.83        30
   macro avg       0.56      0.60      0.57        30
weighted avg       0.78      0.83      0.80        30

Accuracy score: 83.33333333333334
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix

Decision tree classifier		0.8	
Logistic Regression		0.8	
K-Nearest Neighbors		0.83	
Gradient Boosting		0.83