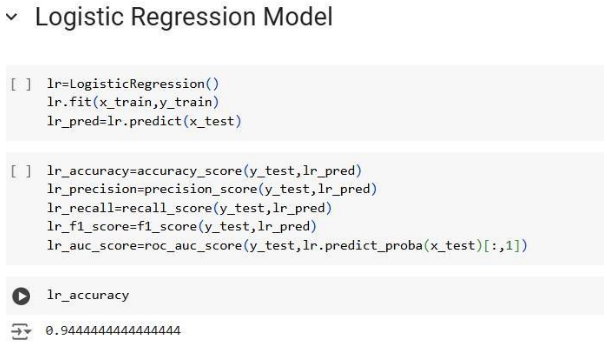
Model Development Phase Template

Date	15 July 2024
Team ID	739760
Project Title	Space X Falcon 9 First Stage Landing Success Predictor
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:



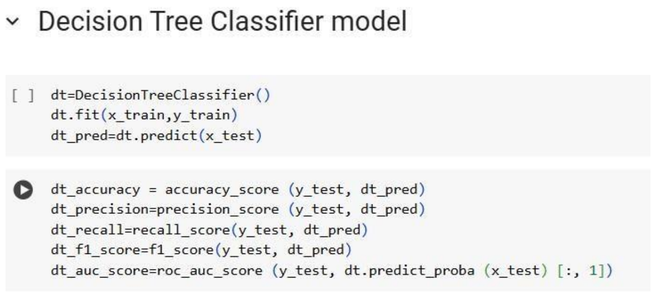
Logistic Regression Model

```
lr=LogisticRegression()
lr.fit(x_train,y_train)
lr_pred=lr.predict(x_test)
```

```
lr_accuracy=accuracy_score(y_test,lr_pred)
lr_precision=precision_score(y_test,lr_pred)
lr_recall=recall_score(y_test,lr_pred)
lr_f1_score=f1_score(y_test,lr_pred)
lr_auc_score=roc_auc_score(y_test,lr.predict_proba(x_test)[:,1])
```

```
lr_accuracy
```

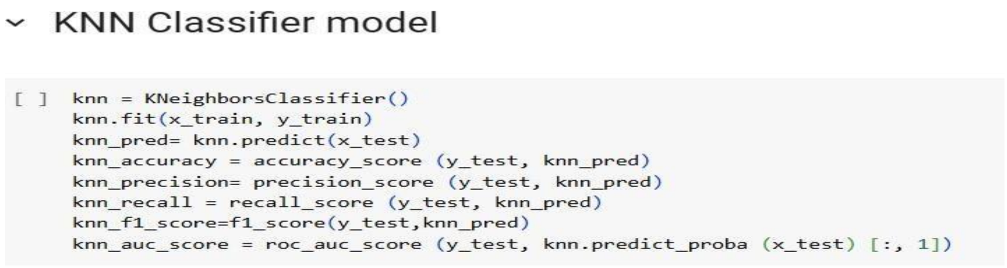
```
0.9444444444444444
```



Decision Tree Classifier model

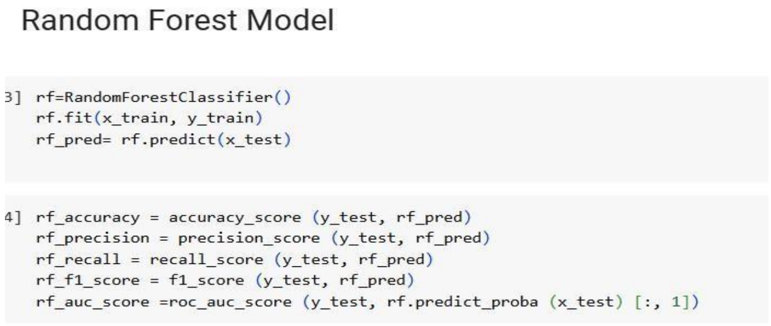
```
dt=DecisionTreeClassifier()
dt.fit(x_train,y_train)
dt_pred=dt.predict(x_test)
```

```
dt_accuracy = accuracy_score (y_test, dt_pred)
dt_precision=precision_score (y_test, dt_pred)
dt_recall=recall_score(y_test, dt_pred)
dt_f1_score=f1_score(y_test, dt_pred)
dt_auc_score=roc_auc_score (y_test, dt.predict_proba (x_test) [:, 1])
```



KNN Classifier model

```
knn = KNeighborsClassifier()
knn.fit(x_train, y_train)
knn_pred= knn.predict(x_test)
knn_accuracy = accuracy_score (y_test, knn_pred)
knn_precision= precision_score (y_test, knn_pred)
knn_recall = recall_score (y_test, knn_pred)
knn_f1_score=f1_score(y_test,knn_pred)
knn_auc_score = roc_auc_score (y_test, knn.predict_proba (x_test) [:, 1])
```

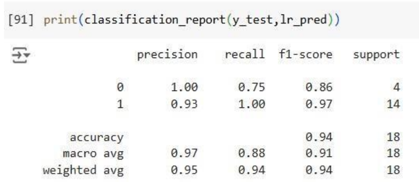
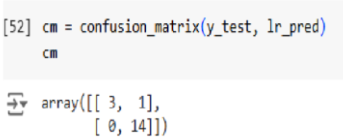
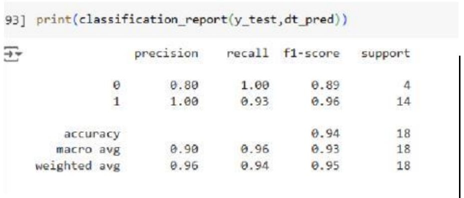
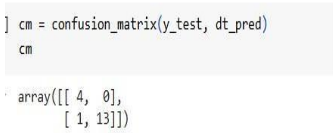


Random Forest Model

```
rf=RandomForestClassifier()
rf.fit(x_train, y_train)
rf_pred= rf.predict(x_test)
```

```
rf_accuracy = accuracy_score (y_test, rf_pred)
rf_precision = precision_score (y_test, rf_pred)
rf_recall = recall_score (y_test, rf_pred)
rf_f1_score = f1_score (y_test, rf_pred)
rf_auc_score =roc_auc_score (y_test, rf.predict_proba (x_test) [:, 1])
```

Model Validation and Evaluation Report:

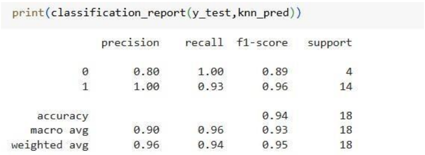
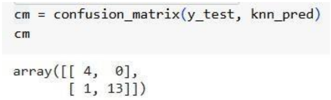
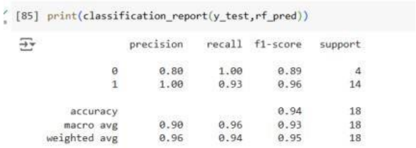
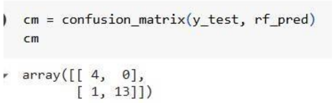
Model	Classification Report	F1 Score	Confusion Matrix
Logistic Regression		96%	
Decision Tree		96%	

```
[91] print(classification_report(y_test,lr_pred))

              precision    recall  f1-score   support

           0       1.00      0.75      0.86         4
           1       0.93      1.00      0.97        14

    accuracy                           0.94        18
   macro avg       0.97      0.88      0.91        18
weighted avg       0.95      0.94      0.94        18
```

```
[52] cm = confusion_matrix(y_test, lr_pred)
     cm

array([[ 3,  1],
       [ 0, 14]])
```

```
93] print(classification_report(y_test,dt_pred))

              precision    recall  f1-score   support

           0       0.80      1.00      0.89         4
           1       1.00      0.93      0.96        14

    accuracy                           0.94        18
   macro avg       0.90      0.96      0.93        18
weighted avg       0.96      0.94      0.95        18
```

```
] cm = confusion_matrix(y_test, dt_pred)
  cm

array([[ 4,  0],
       [ 1, 13]])
```

KNN	 print(classification_report(y_test,knn_pred)) precision recall f1-score support 0 0.80 1.00 0.89 4 1 1.00 0.93 0.96 14 accuracy 0.94 18 macro avg 0.90 0.96 0.93 18 weighted avg 0.96 0.94 0.95 18	96%	 cm = confusion_matrix(y_test, knn_pred) cm array([[4, 0], [1, 13]])
Random Forest	 [85] print(classification_report(y_test,rf_pred)) precision recall f1-score support 0 0.80 1.00 0.89 4 1 1.00 0.93 0.96 14 accuracy 0.94 18 macro avg 0.90 0.96 0.93 18 weighted avg 0.96 0.94 0.95 18	96%	 cm = confusion_matrix(y_test, rf_pred) cm array([[4, 0], [1, 13]])