DEVELOPING A FLIGHT DELAY PREDICTION MODEL USING MACHINE LEARNING

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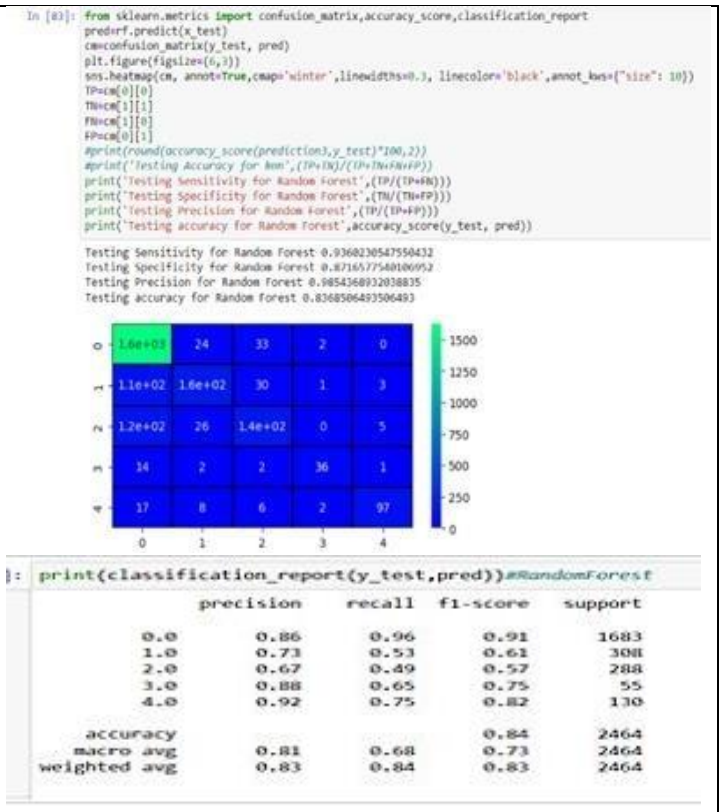
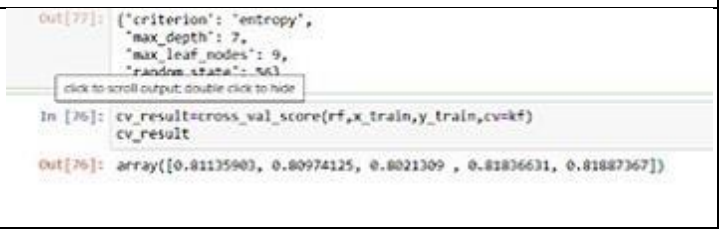
SPRINT-1

Model Performance Testing:

S.No.	Parameter	Values	Screenshot

1.	Metrics	Confusion Matrix, Accuray Score & Classificatio n report	
2.	Tune the model	Hyper parameter tuning	

```
In [83]: from sklearn.metrics import confusion_matrix,accuracy_score,classification_report
pred=rf.predict(x_test)
cm=confusion_matrix(y_test, pred)
plt.figure(figsize=(6,3))
sns.heatmap(cm, annot=True,cmap='winter',linewidths=0.3, linecolor='black',annot_kws={"size": 10})
TP=cm[0][0]
TN=cm[1][1]
FN=cm[1][0]
FP=cm[0][1]
#print(round(accuracy_score(prediction3,y_test)*100,2))
#print('Testing Accuracy for knn',(TP+TN)/(TP+TN+FN+FP))
print('Testing Sensitivity for Random Forest',(TP/(TP+FN)))
print('Testing Specificity for Random Forest',(TN/(TN+FP)))
print('Testing Precision for Random Forest',(TP/(TP+FP)))
print('Testing accuracy for Random Forest',accuracy_score(y_test, pred))

Testing Sensitivity for Random Forest 0.9360230547550432
Testing Specificity for Random Forest 0.8716577540106952
Testing Precision for Random Forest 0.9854368932038835
Testing accuracy for Random Forest 0.8368506493506493
```



```
In [ ]: print(classification_report(y_test,pred))#RandomForest
```

	precision	recall	f1-score	support
0.0	0.86	0.96	0.91	1683
1.0	0.71	0.53	0.61	308
2.0	0.67	0.49	0.57	288
3.0	0.88	0.65	0.75	55
4.0	0.92	0.75	0.82	130
accuracy			0.84	2464
macro avg	0.81	0.68	0.73	2464
weighted avg	0.83	0.84	0.83	2464

```
Out[77]: {'criterion': 'entropy',
          'max_depth': 7,
          'max_leaf_nodes': 9,
          'random_state': 563}
```

click to scroll output; double click to hide

```
In [76]: cv_result=cross_val_score(rf,x_train,y_train,cv=kf)
         cv_result

Out[76]: array([0.81135903, 0.80974125, 0.8021309 , 0.81836631, 0.81887367])
```