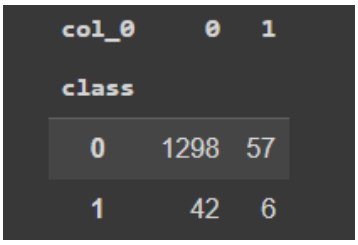
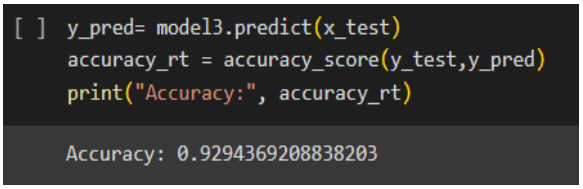
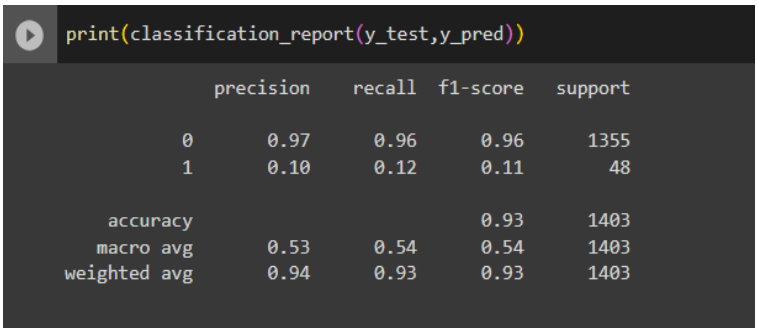
Project Development Phase
Model Performance Test

Date	7 November 2023
Team ID	PNT2022TMID592760
Project Name	Project - Anticipating Business Bankruptcy
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in the model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Metrics	**Classification Model:** Confusion Matrix - , Accuray Score- & Classification Report	**Model Implemented-** Random Forest Classifier **Confusion Matrix**  col_0 0 1 class 0 1298 57 1 42 6 **Accuracy Score**  [ ] y_pred= model3.predict(x_test) accuracy_rt = accuracy_score(y_test,y_pred) print("Accuracy:", accuracy_rt) Accuracy: 0.9294369208838203 **Classification Report**  print(classification_report(y_test,y_pred)) precision recall f1-score support 0 0.97 0.96 0.96 1355 1 0.10 0.12 0.11 48 accuracy 0.93 1403 macro avg 0.53 0.54 0.54 1403 weighted avg 0.94 0.93 0.93 1403

2.	Tune the Model	Hyperparameter Tuning - GridSearchCV	

```
[ ]  clf = GridSearchCV(model3,param_grid = parameters,verbose =2)
     clf.fit(x_train_smote,y_train_smote)

     Fitting 5 folds for each of 48 candidates, totalling 240 fits
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=100; total time=   2.4s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=100; total time=   2.7s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=300; total time=   6.7s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=300; total time=   6.3s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=300; total time=   6.7s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=300; total time=   6.6s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=5, n_estimators=300; total time=   6.3s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=100; total time=   2.5s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=300; total time=   6.6s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=300; total time=   6.2s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=300; total time=   6.7s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=300; total time=   6.2s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=1, min_samples_split=10, n_estimators=300; total time=   6.6s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.0s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.3s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.3s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   6.1s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   6.6s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   6.2s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   6.6s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   6.2s
     [CV] END max_depth=10, max_features=sqrt, min_samples_leaf=2, min_samples_split=10, n_estimators=100; total time=   2.5s
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[CV] END max_depth=30, max_features=log2, min_samples_leaf=1, min_samples_split=10, n_estimators=300; total time=   8.1s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.5s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   3.0s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.5s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.6s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=100; total time=   2.6s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   8.0s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   8.1s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   7.6s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   8.1s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=5, n_estimators=300; total time=   8.1s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=100; total time=   2.5s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=100; total time=   2.5s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=100; total time=   2.5s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=100; total time=   2.9s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=100; total time=   2.6s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=300; total time=   7.5s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=300; total time=   8.0s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=300; total time=   8.0s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=300; total time=   7.6s
[CV] END max_depth=30, max_features=log2, min_samples_leaf=2, min_samples_split=10, n_estimators=300; total time=   8.0s
```

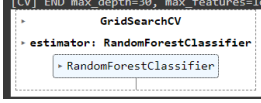


```
[ ]  clf.best_score_

     0.9565823007181175
```

```
[ ]  clf.best_params_

     {'max_depth': 30,
      'max_features': 'sqrt',
      'min_samples_leaf': 1,
      'min_samples_split': 5,
      'n_estimators': 300}
```