Model Development Phase Template

Date	15th July 2024
Team ID	739924
Project Title	Auto Foresight : A Predictive Model for Streamlining Car Loan Repayment Planning
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report:

Theinitialmodeltrainingcodewillbeshowcasedinthefuturethroughascreenshot.Themodel validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

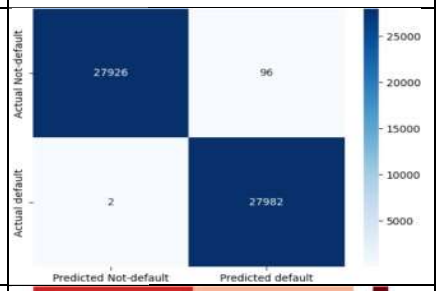
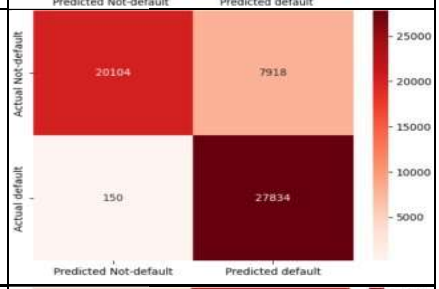
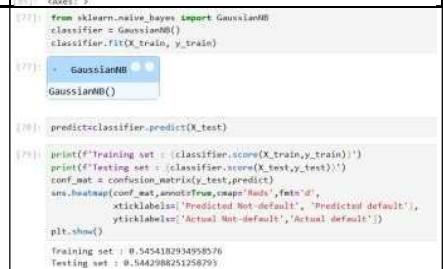
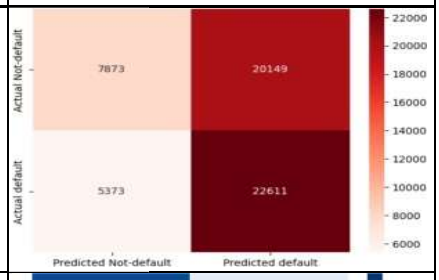
Initial Model Training Code:

Paste the screenshot of the model training code

```
[72]: X_train,X_test,y_train,y_test=train_test_split(X,y,random_state=0,test_size=.25)
      print(X_train.shape)
      print(X_test.shape)
      print(y_train.shape)
      print(y_test.shape)

      (168016, 14)
      (56006, 14)
      (168016,)
      (56006,)

[73]: from sklearn.tree import DecisionTreeClassifier
      classifier = DecisionTreeClassifier(criterion = 'entropy',random_state = 0)
      classifier.fit(X_train, y_train)

[73]: DecisionTreeClassifier
      DecisionTreeClassifier(criterion='entropy', random_state=0)

[74]: prediction = classifier.predict(X_test)

[75]: print("accuracy on training set: %f" % classifier.score(X_train, y_train))
      print("accuracy on test set: %f" % classifier.score(X_test, y_test))
      conf_mat = confusion_matrix(y_test, prediction)
      sns.heatmap(conf_mat, annot=True, cmap='Blues', fmt='d',
                  xticklabels=['Predicted Not-default', 'Predicted default'],
                  yticklabels=['Actual Not-default','Actual default'])
      plt.show()
```

```
[77]: from sklearn.naive_bayes import GaussianNB
      classifier = GaussianNB()
      classifier.fit(X_train, y_train)

[77]: GaussianNB()

[78]: predict=classifier.predict(X_test)

[79]: print(f'Training set : {classifier.score(X_train,y_train)}')
      print(f'Testing set : {classifier.score(X_test,y_test)}')
      conf_mat = confusion_matrix(y_test,predict)
      sns.heatmap(conf_mat,annot=True,cmap='Reds',fmt='d',
                  xticklabels=['Predicted Not-default', 'Predicted default'],
                  yticklabels=['Actual Not-default','Actual default'])
      plt.show()

      Training set : 0.54541829349585 76
      Testing set : 0.5442988251258793
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
Random Forest		99.8%	
K Nearest Neighbors		85.5%	
Gaussian NB		54.4%	
Decision Tree Classifier		99.8%