



## **Model Development Phase Template**

Date	15 <sup>th</sup> July 2024
Team ID	739823
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)
                         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()
```





## **Model Validation and Evaluation Report:**

Model	Classification Report	Accuracy	Confusion Matrix		
Random Forest		99.8%	Actual Not-default.	96	- 25000 - 20000 - 15000
	print('Training ust.'   rand_front.torp(K_tools, v_train)') print('Training ust.'   rand_front.torp(K_tools, v_train)') conf.ms a unfolding ust.'   rand_front.torp(K_tools, v_train)') conf.ms a unfolding_metric(v_tools, prodiction) uss.torang(conf.ms, northerm.angus('Thore'), 'Print')' prickledals('Traininto Northerm', 'Northerm' default') prickledals('Traininto Northerm', 'Actual default')  Training ust. 1.0  Training ust. 1.0  Training ust. 0.000708177170070		Actual default	27982	- 10000
	[RI] - (Acet : X		Predicted Not-default	Predicted default	_
K Nearest Neighbors	From silearn.mighbors import UnighborsClassifier   NN = WhighborsClassifier()   NN fit(X_train, y_train)   NN fit(X_train, y_train, y_train)   NN fit(X_train, y_train, y_train, y_train)   NN fit(X_train, y_train, y_tr	85.5%	Actual Not-default 10102 10102	7918	- 25000 - 20000 - 15000
	print("Training set: ",000.scoro(X_train, y_train))   print("Testing set: ",000.scoro(X_train, y_train))   print("Testing set: ",000.scoro(X_train, y_train))   conf.mat = confusion_matrix(y_test, prediction_kmn)   ses.beatmap(comf_sut, anontTrue, comp* Read', fact's"),   ses.beatmap(comf_sut, anontTrue, comp* Read', fact's"),   yticklabels="facting libet-default', "Predicted default'),   yticklabels="facting libet-default', "Actual default')]   Training set: 0.000974045243100		Actual default	27834	- 10000 - 5000
	Testing sut : 8.8559440859993572		Predicted Not-default	Predicted default	
print("" funting set : (classifier.accor(), tec conf_set = confision_metric(), tect, predict) uns.beatmap(conf_set, amoutsfreu, compor lands , if xis.labelator ("activated in a "residuated late" technical yticklabelator ("Actual Wat-default" plt.shms() fraining set : 0.564182938958576 Testing set : 0.564282938958579 ["Pere silam.tes impere DecisionFeedissifier	classifier = GamesianOM() classifier = First, y_train) - GausianOM - GaussianOM()	54.4%	Actual Not-default	20149	- 22000 - 20000 - 18000 - 16000
	<pre>[70] print(f*Training set : (classifier.score(X_train,y_train))*) print(f*Training set : (classifier.score(X_train,y_train))*) conf_mat = confusion_matrix(y_text_predict) set.hustusp(conf_mat, anoutsTrum_crasp="Mode', fest="d",</pre>		Actual default	22611	- 14000 - 12000 - 10000 - 8000 - 6000
	Testing set : 0.5442988251258793		Predicted Not-default	Predicted default	
Decision Tree	<pre>disssfile = Decision/reclassifier(riterion = 'entropy', random_state = 0) classifier_fix(K_train, y_train)  Decision/reclassifier  Decision/reclassifier(criterion='entropy', random_state=0)</pre>	99.8%	Actual Not-default	2771	- 25000 - 20000
Classifier	[74] prediction c classifier_predict(K_text) [77] print("accomage on twising out N° % classifier_score(K_train, y_train)) print("accomage on test N° % classifier_score(K_text, y_text)) conf_mat = contaiton_matrix(g_text, prediction) pre. heatmos(conf_mat_monotfree, compositions*, fact d's', xicklabelsc ("recdicted fon-default", "Predicted default"), yitcklabelsc ("betwel Not-default", 'Actual default"); pit. (Not)		Actual default	27982	- 15000 - 10000 - 5000
	accuracy on training set: 1,000000 accuracy on test set: 8,050487		Predicted Not-default	Predicted default	