Project Development Phase
Model Performance Test

Date	21st November 2023
Team ID	Team-593183
Project Name	Car Purchase Prediction using ML
Maximum Marks	10 Marks

Model Performance Testing:

In this project we have obtained highest accuracy of 78.75% using two different classification models; i.e.; **Support Vector Classifier** and **Naive Bayes Classifier.**

Support Vector Classifier:

Sl. No.	Parameter	Values	Screenshot
1.	Metrics	**Classification Model:**	

		Confusion Matrix	`[107] from sklearn.metrics import confusion_matrix`
			`cms = confusion_matrix(y_test, y_pred)`
			`cms`
			
			`array([[ 5, 1, 0, 1],`
			`[ 1, 48, 2, 0],`
			`[ 0, 1, 7, 0],`
			`[ 2, 4, 5, 3]])`

		Accuracy Score	`[105] accuracy_score(y_test,y_pred)`
			
			`0.7875`

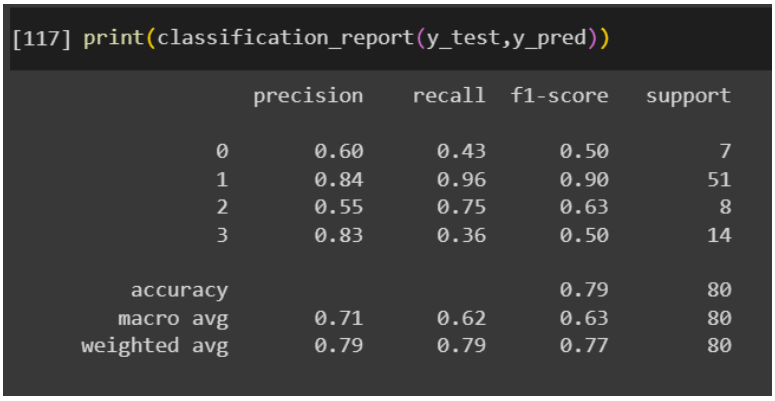
		Classification Report	`[106] print(classification_report(y_test,y_pred))` precision recall f1-score support 0 0.62 0.71 0.67 7 1 0.89 0.94 0.91 51 2 0.50 0.88 0.64 8 3 0.75 0.21 0.33 14 accuracy 0.79 80 macro avg 0.69 0.69 0.64 80 weighted avg 0.80 0.79 0.76 80

2.	Tune the Model	Validation Method	**4. Support Vector Classification**
			`[100] from sklearn.svm import SVC`
			`SVC_model=SVC(kernel='rbf',random_state=0)`
			`SVC_model.fit(x_train,y_train)`
			SVC
			SVC(random_state=0)
			`y_pred=SVC_model.predict(x_test)`
			`y_pred`
			array([0, 2, 1, 2, 1, 1, 2, 1, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 3, 1, 1,
			0, 3, 1, 0, 1, 1, 2, 1, 1, 1, 1, 2, 1, 3, 1, 1, 1, 1, 1, 0, 1, 1, 0,
			1, 2, 1, 1, 1, 1, 1, 3, 1, 1, 1, 1, 2, 2, 1, 1, 1, 1, 2, 1, 1, 2,
			1, 2, 1, 2, 2, 1, 1, 1, 1, 1, 2, 0, 1, 1])
			`[102] y_test`
			209 1
			280 3
			33 1
			210 2
			93 1
			..
			246 1
			227 3
			369 0
			176 1
			289 3
			Name: purchased_car, Length: 80, dtype: int64
			`[103] SVC_model.predict([[1,51,23000]])`
			/usr/local/lib/python3.10/dist-packages/sklearn/base.py:439: UserWarning: X does not have valid feature names, but SVC was fitted with feature names
			warnings.warn(
			array([3])
			`[104] from sklearn.metrics import accuracy_score,classification_report`
			`[105] accuracy_score(y_test,y_pred)`
			0.7875

Naive Bayes Classifier:

Sl. No.	Parameter	Values	Screenshot

1.	Metrics	**Classification Model:**
		
		Confusion Matrix
		
		Accuracy Score
			`[118] from sklearn.metrics import confusion_matrix`
			`cmn = confusion_matrix(y_test, y_pred)`
			`cmn`
			array([[3, 3, 1, 0],
			[1, 49, 1, 0],
			[0, 1, 6, 1],
			[1, 5, 3, 5]])
			`[116] accuracy_score(y_test,y_pred)`
			0.7875

		Classification Report	
2.	Tune the Model	Validation Method