Project Development Phase
Model Performance Test

Date	10 November 2022
Team ID	PNT2022TMID52278
Project Name	Project - Car Resale Value Prediction
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	**Regression Model:** MAE - , MSE - , RMSE - , R2 score -	In [25]: `from sklearn.metrics import mean_squared_error,mean_absolute_error`
			`mse = mean_squared_error(Y_test, y_pred)`
			`print(mse)`
			11837192.971239958
			
			In [26]: `rmse = np.sqrt(mse)`
			`print(rmse)`
			`mae = mean_absolute_error(Y_test, y_pred)`
			`print(mae)`
			3440.5221945570934
			1635.1608915188156
			
			In [17]: `y_pred = regressor.predict(X_test)`
			`print(r2_score(Y_test,y_pred))`
			0.834527626497731

2	Tune the Model	Hyperparameter Tuning - **n_estimators** = [5,20,50,100] **max_features** = ['auto', 'sqrt'] **max_depth** = [10-120] **min_samples_split** = [2, 6, 10] **min_samples_leaf** = [1, 3, 4] **bootstrap** = [True, False] Validation Method - **RandomisedGridSearchCV**	(see code below)

```python
In [33]: n_estimators = [5,20,50,100]
         max_features = ['auto', 'sqrt']
         max_depth = [int(x) for x in np.linspace(10, 120, num = 12)]
         min_samples_split = [2, 6, 10]
         min_samples_leaf = [1, 3, 4]
         bootstrap = [True, False]

         random_grid = {'n_estimators': n_estimators,

         'max_features': max_features,

         'max_depth': max_depth,

         'min_samples_split': min_samples_split,

         'min_samples_leaf': min_samples_leaf,

         'bootstrap': bootstrap}
```

```python
In [34]: from sklearn.model_selection import RandomizedSearchCV
         rf_random = RandomizedSearchCV(estimator = regressor,param_distributions = random_grid,
                     n_iter = 100, cv = 5, verbose=2, random_state=35, n_jobs = -1)
```

```python
In [36]: rf_random.fit(X_train, Y_train)
```

```
         Fitting 5 folds for each of 100 candidates, totalling 500 fits

         C:\ProgramData\Anaconda3\lib\site-packages\sklearn\model_selection\_search.py:926: DataCo
         passed when a 1d array was expected. Please change the shape of y to (n_samples,), for ex
           self.best_estimator_.fit(X, y, **fit_params)
```

```
Out[36]: RandomizedSearchCV(cv=5,
                            estimator=RandomForestRegressor(max_depth=10,
                                                            n_estimators=1000,
                                                            random_state=34),
                            n_iter=100, n_jobs=-1,
                            param_distributions={'bootstrap': [True, False],
                                                 'max_depth': [10, 20, 30, 40, 50, 60,
                                                               70, 80, 90, 100, 110,
                                                               120],
                                                 'max_features': ['auto', 'sqrt'],
                                                 'min_samples_leaf': [1, 3, 4],
                                                 'min_samples_split': [2, 6, 10],
                                                 'n_estimators': [5, 20, 50, 100]},
                            random_state=35, verbose=2)
```