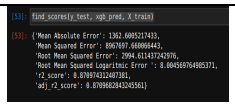
Project Development Phase
Model Performance Testing

Date	17 November 2022
Team ID	PNT2022TMID16274
Project Name	Project - Car Resale Value Prediction
Maximum Marks	10 Marks

Model Performance Testing :

S.No	Parameter	Values	Screenshot
1	Metrics	Regression model : xgboost MAE : 1362.6005 MSE : 8967697.66 RMSE : 2994.6114 RMSLE : 8.00456 r2_score : 0.8709 adj_r2_score : 0.9709	
2	Tune the model		

1) Metrics

```
import numpy as np
from sklearn.metrics import mean_squared_error as MSE, mean_absolute_error as MAE, r2_score

def find_scores(y_test, y_pred, X_train):
    scores = dict()
    mae = MAE(y_test, y_pred)
    mse = MSE(y_test, y_pred)
    rmse = np.sqrt(mse)
    rmsle = np.log(rmse)
    r2 = r2_score(y_test, y_pred)
    n, k = X_train.shape
    adj_r2_score = 1 - ((1-r2)*(n-1)/(n-k-1))

    scores['Mean Absolute Error']=mae
    scores['Mean Squared Error']=mse
    scores['Root Mean Squared Error']=rmse
    scores['Root Mean Squared Logaritmic Error ']=rmsle
    scores['r2_score']=r2
    scores['adj_r2_score']=adj_r2_score

    return scores

find_scores(y_test, xgb_pred, X_train)
```

Output :

```
[53]: find_scores(y_test, xgb_pred, X_train)

[53]: {'Mean Absolute Error': 1362.6005217433,
       'Mean Squared Error': 8967697.660066443,
       'Root Mean Squared Error': 2994.611437242976,
       'Root Mean Squared Logaritmic Error ': 8.004569764985371,
       'r2_score': 0.870974312407381,
       'adj_r2_score': 0.8709682843245561}
```

2. Performance Hyperparameters

```
xgb_configs = {
    "name" : "xgboost",
    "method": "grid",
    "metric": {
        "name" : "adj_r2",
        "goal" : "maximize"
    },
    "parameters" : {
        "Learning_ rate": {
            "values " : [0.01, 0.03, 0.05, 0.07]
        },
        "objective ": {
            "values" : ['root mean_ squared_error']
        },
        "boosting type" : {
            "values" : ['gbdt', 'dart', 'goss', 'rf']
        },
        "reg sqrt": {
            "values " : [True]
        },
        "metric" : {
            "values" : ["rmse"]
        },
        "n_estimators" : {
            "values" : [108, 200, 300]
        },
        "random state" : {
            "values" : [42]
        }
    }
}
```