**Project Development Phase**
**Model Performance Test**

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| Date | 18 November 2022 |
| Team ID | PNT2022TMID07489 |
| Project Name | Project - Developing a Flight Delay Prediction Model using Machine Learning |
| Maximum Marks | 10 Marks |

**Model Performance Testing:**

Project team shall fill the following information in model performance testing template.

| S.No. | Parameter | Values | Screenshot |
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| 1. | Metrics | **Classification Model:** Confusion Matrix , Accuracy Score & Classification Report | In [24]:<br>`#Model Evaluation`<br>`from sklearn.metrics import accuracy_score,confusion_matrix, classification_report`<br>`print(accuracy_score(y_test, pred))`<br>`0.9163899788711138`<br><br>In [26]:<br>`print(confusion_matrix(y_test, pred))`<br>`[[2732 164]`<br>` [ 113 304]]`<br><br>In [27]:<br>`print(classification_report(y_test, pred))`<br>`precision recall f1-score support`<br>`0.0 0.96 0.94 0.95 2896`<br>`1.0 0.65 0.73 0.69 417`<br>`accuracy 0.92 3313`<br>`macro avg 0.80 0.84 0.82 3313`<br>`weighted avg 0.92 0.92 0.92 3313` |
| 2. | Tune the Model | Hyperparameter Tuning , Validation Method | In [31]:<br>`from sklearn.model_selection import cross_val_score, KFold, GridSearchCV`<br>`kf = KFold(n_splits = 6, shuffle = True, random_state = 25)`<br>`params = {'max_depth': [4,5,6],`<br>`'min_samples_split': [2,3,4],`<br>`'criterion': ['gini', 'entropy', 'log_loss']}`<br><br>In [32]:<br>`grid_cv = GridSearchCV(clf, params, cv = kf)`<br>`grid_cv.fit(X_train,y_train)`<br><br>Out[32]:<br>GridSearchCV<br>estimator: DecisionTreeClassifier<br>DecisionTreeClassifier<br><br>In [35]:<br>`grid_cv.best_params_`<br><br>Out[35]:<br>`{'criterion': 'entropy', 'max_depth': 6, 'min_samples_split': 2}`<br><br>In [34]:<br>`cv_results = cross_val_score(clf, X_train,y_train, cv = kf)`<br>`print(cv_results)`<br>`[0.92552366 0.9193173 0.91925466 0.92934783 0.92313665 0.9060559 ]` |