**Uddesh Soman,**

**XGBoost Hyper Parameter Tuning Results**

**Scoring Criterion Used : roc\_auc**

**Before Hyper parameter Tuning**

Classifier: XGBClassifier(alpha=10, base\_score=None, booster=None, colsample\_bylevel=1, colsample\_bynode=1, colsample\_bytree=1, gamma=0, gpu\_id=None, importance\_type='gain', interaction\_constraints=None, learning\_rate=1.0, max\_delta\_step=None, max\_depth=4, min\_child\_weight=1, missing=nan, monotone\_constraints=None, n\_estimators=500, n\_jobs=None, num\_parallel\_tree=None, random\_state=None, reg\_alpha=10, reg\_lambda=1, scale\_pos\_weight=None, subsample=1, tree\_method=None,

validate\_parameters=None, verbosity=None)

Training accuracy: 0.8258

Testing accuracy: 0.7928

Average 10 fold Cross Validation Accuracy for testing data: 0.8024

ROC AUC: 0.8377

Precision: 0.6510

Sensitivity: 0.4911

Specificity: 0.9034

F1: 0.5599

**After Hyper parameter Tuning**

Classifier: XGBClassifier(alpha=10, base\_score=0.5, booster='gbtree', colsample\_bylevel=0.5, colsample\_bynode=0.6, colsample\_bytree=0.94, gamma=0.3, gpu\_id=-1, importance\_type='gain', interaction\_constraints='', learning\_rate=0.7, max\_delta\_step=0, max\_depth=3, min\_child\_weight=3, missing=nan, monotone\_constraints='()', n\_estimators=8, n\_jobs=8, num\_parallel\_tree=1, random\_state=0, reg\_alpha=10, reg\_lambda=1, scale\_pos\_weight=1, subsample=0.97, tree\_method='exact', validate\_parameters=1, verbosity=None)

Training accuracy: 0.8104

Testing accuracy: 0.7976

Average 10 fold Cross Validation Accuracy for testing data: 0.8085

ROC AUC: 0.8351 (GridSearch CV best score : 0.8497)

Precision: 0.6520

Sensitivity: 0.5265

Specificity: 0.8970

F1: 0.5826