Model Development Phase Template

Date	15 March 2024
Team ID	xxxxxx
Project Title	Human Resource Management: Predicting Employee Promotions Using Machine Learning
Maximum Marks	10 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The model validation and evaluation report will include a summary and training and validation performance metrics for multiple models. The details will be presented through respective screenshots.

Initial Model Training Code:

```
# Decision Tree
def decisionTree(x_train, x_test, y_train, y_test):
    dt = DecisionTreeClassifier()
    dt.fit(x_train, y_train)
    yPred = dt.predict(x_test)
    print('***DecisionTreeClassifier***')
    print('Confusion matrix')
    print(confusion_matrix(y_test, yPred))
    print('Classification report')
    print(classification_report(y_test, yPred))
```

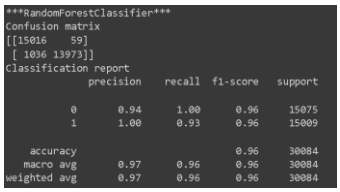
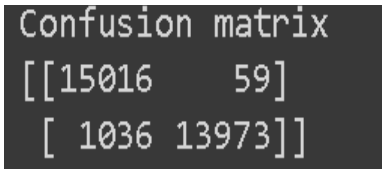
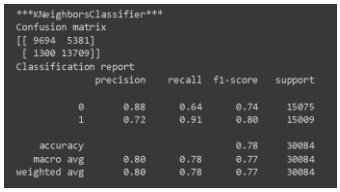
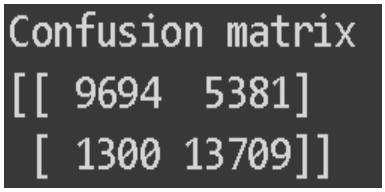
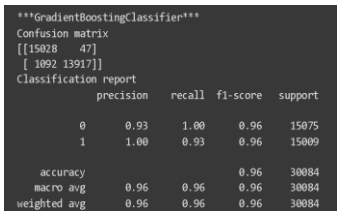
```
# Random Forest
def randomForest(x_train, x_test, y_train, y_test):
    rf = RandomForestClassifier()
    rf.fit(x_train, y_train)
    yPred = rf.predict(x_test)
    print('***RandomForestClassifier***')
    print('Confusion matrix')
    print(confusion_matrix(y_test, yPred))
    print('Classification report')
    print(classification_report(y_test, yPred))
```

```
# KNN
def KNN(x_train, x_test, y_train, y_test):
    knn = KNeighborsClassifier()
    knn.fit(x_train, y_train)
    yPred = knn.predict(x_test)
    print('***KNeighborsClassifier***')
    print('Confusion matrix')
    print(confusion_matrix(y_test, yPred))
    print('Classification report')
    print(classification_report(y_test, yPred))
```

```
# Xg Boost Model
def xgboost(x_train, x_test, y_train, y_test):
    xg= GradientBoostingClassifier()
    xg.fit(x_train, y_train)
    yPred = xg.predict(x_test)
    print('***GradientBoostingClassifier***')
    print('Confusion matrix')
    print(confusion_matrix(y_test, yPred))
    print('Classification report')
    print(classification_report(y_test, yPred))
```

Model validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
Decision Tree	***DecisionTreeClassifier*** Confusion matrix [[14090 985] [798 14211]] Classification report precision recall f1-score support 0 0.95 0.93 0.94 15075 1 0.94 0.95 0.94 15009 accuracy 0.94 30084 macro avg 0.94 0.94 0.94 30084 weighted avg 0.94 0.94 0.94 30084	94%	Confusion matrix [[14090 985] [798 14211]]

Random Forest		96%	
KNN		91%	
Xgboost		96%