Model Development Phase Template

Date	11 July 2024
Team ID	SWTID1720075414
Project Title	Panic Disorder Detection
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased through a screenshot. The model validation and evaluation report also includes classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

Initial Model Training Code:

```
def train_models_eval(x_res,y_res,fts):
```

Random Forest

```
    print("\n--->RANDOM FOREST" )
    rf = RandomForestClassifier(random_state=1234)
    rf.fit(x_res[fts], y_res)
    y_pred=rf.predict(x_test[fts])
    print(confusion_matrix(y_test,y_pred))
    print(classification_report(y_test,y_pred))
    print("SCORE:",rf.score(x_test[fts],y_test))
```

Decision Tree

```
print("\n--->DECISION TREE")
dtf = DecisionTreeClassifier(random_state=1234)
dtf.fit(x_res[fts], y_res)
y_pred=dtf.predict(x_test[fts])
print(confusion_matrix(y_test,y_pred))
print(classification_report(y_test,y_pred))
print("SCORE:",dtf.score(x_test[fts],y_test))
```

K-Nearest Neighbor

```
print(" \n--->KNN")
knn = KNeighborsClassifier()
knn.fit(x_res[fts], y_res)
y_pred=knn.predict(x_test[fts])
print(confusion_matrix(y_test,y_pred))
print(classification_report(y_test,y_pred))
print("SCORE:",knn.score(x_test[fts],y_test))
```

Extras Trees Classifier

```
print("\n--->EXTRAS TREES CLASSIFIER")
etc = ExtraTreesClassifier(random_state=1234)
etc.fit(x_res[fts],y_res)
y_pred=etc.predict(x_test[fts])
print(confusion_matrix(y_test,y_pred))
print(classification_report(y_test,y_pred))
print("SCORE:",etc.score(x_test[fts],y_test))
```

XGBoost

```
print("\n--->XGBOOST" )
xgb = xgboost.XGBClassifier ()
xgb.fit(x_res[fts], y_res)
y_pred=gb.predict(x_test[fts])
print(confusion_matrix(y_test,y_pred))
print(classification_report(y_test,y_pred))
print("SCORE:", xgb.score(x_test[fts],y_test))

return rf,dtf,knn,etc,xgb
```

```
fts = ['Gender',
 'Family History',
 'Personal History',
 'Current Stressors',
 'Symptoms',
 'Severity',
 'Impact on Life',
 'Demographics',
 'Medical History',
 'Psychiatric History',
 'Substance Use',
 'Coping Mechanisms',
 'Social Support',
 'Lifestyle Factors']
```

Training the models

```
rf,dtf,knn,etc,xgb = train_models_eval(x_res,y_res,fts)
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
Random Forest	---›RANDOM FOREST [[18410 749] [727 114]] precision recall f1-score support 0 0.96 0.96 0.96 19159 1 0.13 0.14 0.13 841 accuracy 0.93 20000 macro avg 0.55 0.55 0.55 20000 weighted avg 0.93 0.93 0.93 20000 SCORE: 0.9262	92.6%	---›RANDOM FOREST [[18410 749] [727 114]]
Decision Tree	---›DECISION TREE [[18383 776] [724 117]] precision recall f1-score support 0 0.96 0.96 0.96 19159 1 0.13 0.14 0.13 841 accuracy 0.93 20000 macro avg 0.55 0.55 0.55 20000 weighted avg 0.93 0.93 0.93 20000 SCORE: 0.925	92.5%	---›DECISION TREE [[18383 776] [724 117]]
K Nearest Neighbours	---›KNN [[18652 507] [754 87]] precision recall f1-score support 0 0.96 0.97 0.97 19159 1 0.15 0.10 0.12 841 accuracy 0.94 20000 macro avg 0.55 0.54 0.54 20000 weighted avg 0.93 0.94 0.93 20000 SCORE: 0.93695	93.7%	---›KNN [[18652 507] [754 87]]
Extras Tree Classifier	---›EXTRAS TREES CLASSIFIER [[18447 712] [727 114]] precision recall f1-score support 0 0.96 0.96 0.96 19159 1 0.14 0.14 0.14 841 accuracy 0.93 20000 macro avg 0.55 0.55 0.55 20000 weighted avg 0.93 0.93 0.93 20000 SCORE: 0.92805	92.8%	---›EXTRAS TREES CLASSIFIER [[18447 712] [727 114]]

XGBoost	---›XGBOOST [[18378 781] [724 117]] precision recall f1-score support 0 0.96 0.96 0.96 19159 1 0.13 0.14 0.13 841 accuracy 0.92 20000 macro avg 0.55 0.55 0.55 20000 weighted avg 0.93 0.92 0.93 20000 SCORE: 0.92475	92.47%	---›XGBOOST [[18378 781] [724 117]]