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 [[18858 301] [16 825]] precision recall f1-score support 0 1.00 0.98 0.99 19159 1 0.73 0.98 0.84 841 accuracy 0.98 20000 macro avg 0.87 0.98 0.92 20000 weighted avg 0.99 0.98 0.99 20000 SCORE: 0.98415	98.4%	---›RANDOM FOREST [[18858 301] [16 825]]
Decision Tree	---›DECISION TREE [[18904 255] [6 835]] precision recall f1-score support 0 1.00 0.99 0.99 19159 1 0.77 0.99 0.86 841 accuracy 0.99 20000 macro avg 0.88 0.99 0.93 20000 weighted avg 0.99 0.99 0.99 20000 SCORE: 0.98695	98.69%	---›DECISION TREE [[18904 255] [6 835]]

K Nearest Neighbors	--->KNN [[14638 4521] [34 807]] precision recall f1-score support 0 1.00 0.76 0.87 19159 1 0.15 0.96 0.26 841 accuracy 0.77 20000 macro avg 0.57 0.86 0.56 20000 weighted avg 0.96 0.77 0.84 20000 SCORE: 0.77225	77.2%	--->KNN [[14638 4521] [34 807]]
Extras Tree Classifier	--->EXTRAS TREES CLASSIFIER [[18692 467] [13 828]] precision recall f1-score support 0 1.00 0.98 0.99 19159 1 0.64 0.98 0.78 841 accuracy 0.98 20000 macro avg 0.82 0.98 0.88 20000 weighted avg 0.98 0.98 0.98 20000 SCORE: 0.976	97.6%	--->EXTRAS TREES CLASSIFIER [[18692 467] [13 828]]
XGBoost	--->XGBOOST [[16528 2631] [1 840]] precision recall f1-score support 0 1.00 0.86 0.93 19159 1 0.24 1.00 0.39 841 accuracy 0.87 20000 macro avg 0.62 0.93 0.66 20000 weighted avg 0.97 0.87 0.90 20000 SCORE: 0.8684	86.8%	--->XGBOOST [[16528 2631] [1 840]]