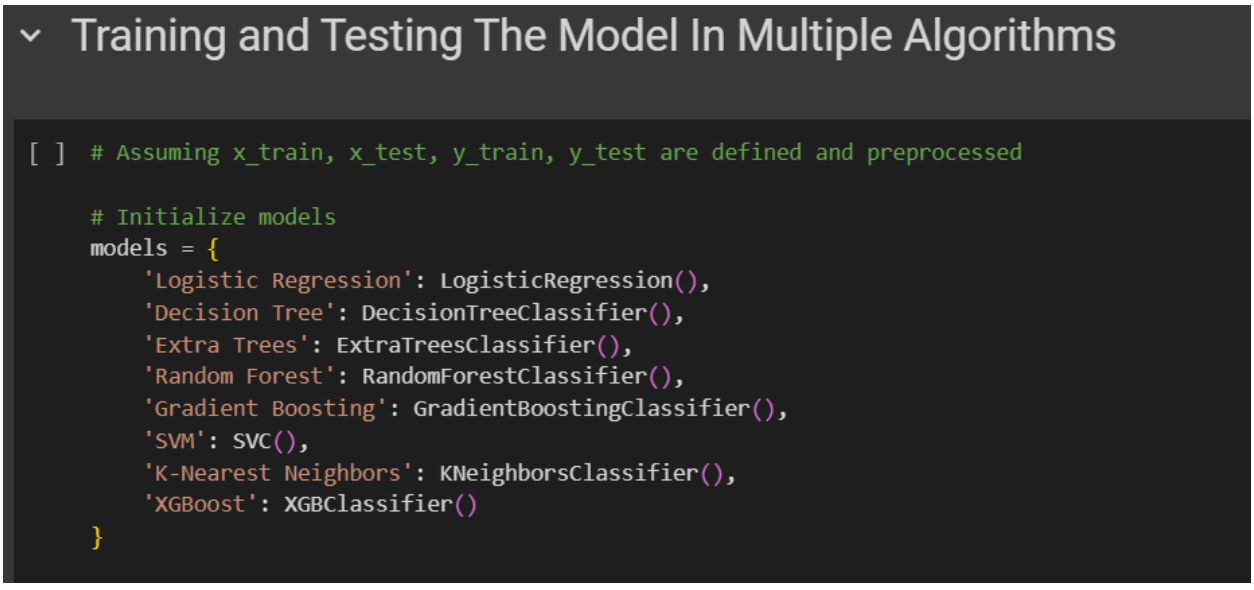
Model Development Phase

Date	9th July 2024
Team ID	SWTID1720017249
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 in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

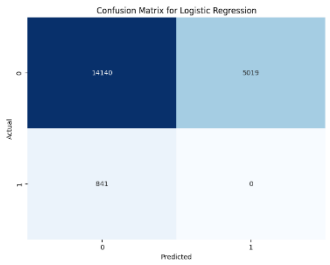
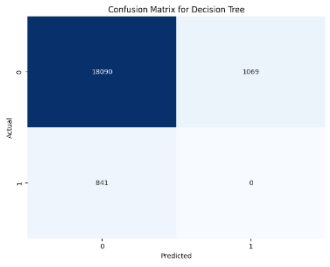
Initial Model Training Code:

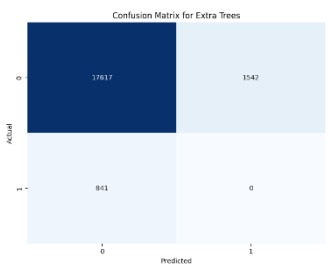
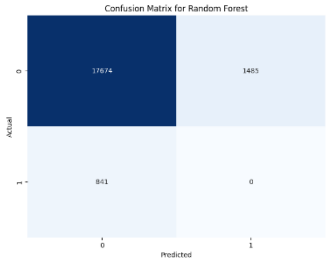
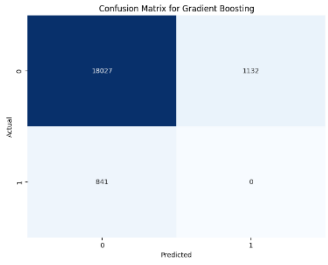
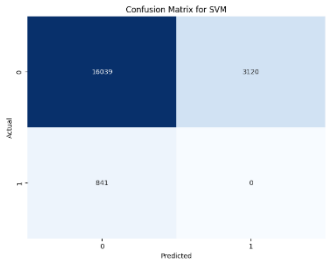
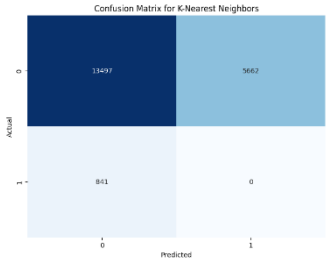


Testing and Comparing Model With Multiple Evaluation Metrics

```
# Train and evaluate each model
for model_name, model in models.items():
    model.fit(x_train_selected, y_train_selected)
    y_pred = model.predict(x_test_selected)

    # Calculate accuracy
    accuracy = accuracy_score(y_test_selected, y_pred)
    print(f"{model_name} - Accuracy: {accuracy:.4f}")

    # Display confusion matrix
    plt.figure(figsize=(8, 6))
    cm = confusion_matrix(y_test, y_pred)
    sns.heatmap(cm, annot=True, cmap='Blues', fmt='d', cbar=False)
    plt.title(f"Confusion Matrix for {model_name}")
    plt.xlabel('Predicted')
    plt.ylabel('Actual')
    plt.show()

    # Display classification report
    print(f"Classification Report for {model_name}:")
    print(classification_report(y_test_selected, y_pred))
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
Logistic Regression	Classification Report for Logistic Regression: precision recall f1-score support 0 0.94 0.74 0.83 19159 1 0.00 0.00 0.00 841 accuracy 0.71 20000 macro avg 0.47 0.37 0.41 20000 weighted avg 0.90 0.71 0.79 20000	70.70	
Decision Tree	Classification Report for Decision Tree: precision recall f1-score support 0 0.96 0.94 0.95 19159 1 0.00 0.00 0.00 841 accuracy 0.90 20000 macro avg 0.48 0.47 0.47 20000 weighted avg 0.92 0.90 0.91 20000	90.45	

Extra Trees	Classification Report for Extra Trees: precision recall f1-score support 0 0.95 0.92 0.94 19159 1 0.00 0.00 0.00 841 accuracy 0.88 20000 macro avg 0.48 0.46 0.47 20000 weighted avg 0.91 0.88 0.90 20000	88.09	
Random Forest	Classification Report for Random Forest: precision recall f1-score support 0 0.95 0.92 0.94 19159 1 0.00 0.00 0.00 841 accuracy 0.88 20000 macro avg 0.48 0.46 0.47 20000 weighted avg 0.91 0.88 0.90 20000	88.37	
Gradient Boosting	Classification Report for Gradient Boosting: precision recall f1-score support 0 0.96 0.94 0.95 19159 1 0.00 0.00 0.00 841 accuracy 0.90 20000 macro avg 0.48 0.47 0.47 20000 weighted avg 0.92 0.90 0.91 20000	90.13	
SVM	Classification Report for SVM: precision recall f1-score support 0 0.95 0.84 0.89 19159 1 0.00 0.00 0.00 841 accuracy 0.80 20000 macro avg 0.48 0.42 0.45 20000 weighted avg 0.91 0.80 0.85 20000	80.20	
K-Nearest Neighbors	Classification Report for K-Nearest Neighbors: precision recall f1-score support 0 0.94 0.70 0.81 19159 1 0.00 0.00 0.00 841 accuracy 0.67 20000 macro avg 0.47 0.35 0.40 20000 weighted avg 0.90 0.67 0.77 20000	67.48	

XGBoost	Classification Report for XGBoost: precision recall f1-score support 0 0.96 0.95 0.95 19159 1 0.00 0.00 0.00 841 accuracy 0.91 20000 macro avg 0.48 0.48 0.48 20000 weighted avg 0.92 0.91 0.91 20000	0.9155