**Model Development Phase Template**

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| Date | 15 July 2024 |
| Team ID | 739935 |
| Project Title | Panic Disorder Detection |
| Maximum Marks | 6 Marks |

**Model Selection Report**

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

**Model Selection Report:**

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| **Model** | **Description** | **Hyperparameters** | **Performance Metric (e.g., Accuracy, F1 Score)** |
| Decision Tree | A decision tree is a valuable machine learning technique for panic disorder detection due to its transparency, interpretability, and ability to handle both numerical and categorical data. By leveraging decision trees, healthcare providers can enhance diagnostic accuracy, tailor treatment plans based on individual risk factors, and improve outcomes for individuals affected by panic disorder. | {'criterion': 'Gini', 'max \_depth': 5, 'max \_features': None, 'min \_samples \_leaf': 1, 'min \_samples \_split': 2} | Accuracy value=0.7750 |
| Random Forest | Implementing a random forest for panic disorder detection requires expertise in both machine learning and clinical psychology to ensure that the model is accurate, reliable, and clinically meaningful. | {'max \_depth': 5, 'max \_features': 'sqrt', 'min \_samples \_leaf': 1, 'min \_ samples \_ split': 2, 'n \_ estimators ': 200} | Accuracy value=0.7973 |
| **XG Boost** | Xg Boost (extreme Gradient Boosting) is another powerful machine learning algorithm that can be used for panic disorder detection, similar to random forest | {' Col sample \_ by tree ': 0.8, 'gamma': 0, 'max \_ depth': 4, 'min\_ child \_ weight': 20} | **Accuracy Value=0.77600** |
| **KNN** | KNN's simplicity and interpretability can be advantageous, but its computational cost and sensitivity to noisy or irrelevant features should also be considered | **{'algorithm': 'brute', 'leaf size': 20, 'neighbors': 7, 'p': 1, 'weights': 'uniform'}** | **Accuracy Value=0.7499** |