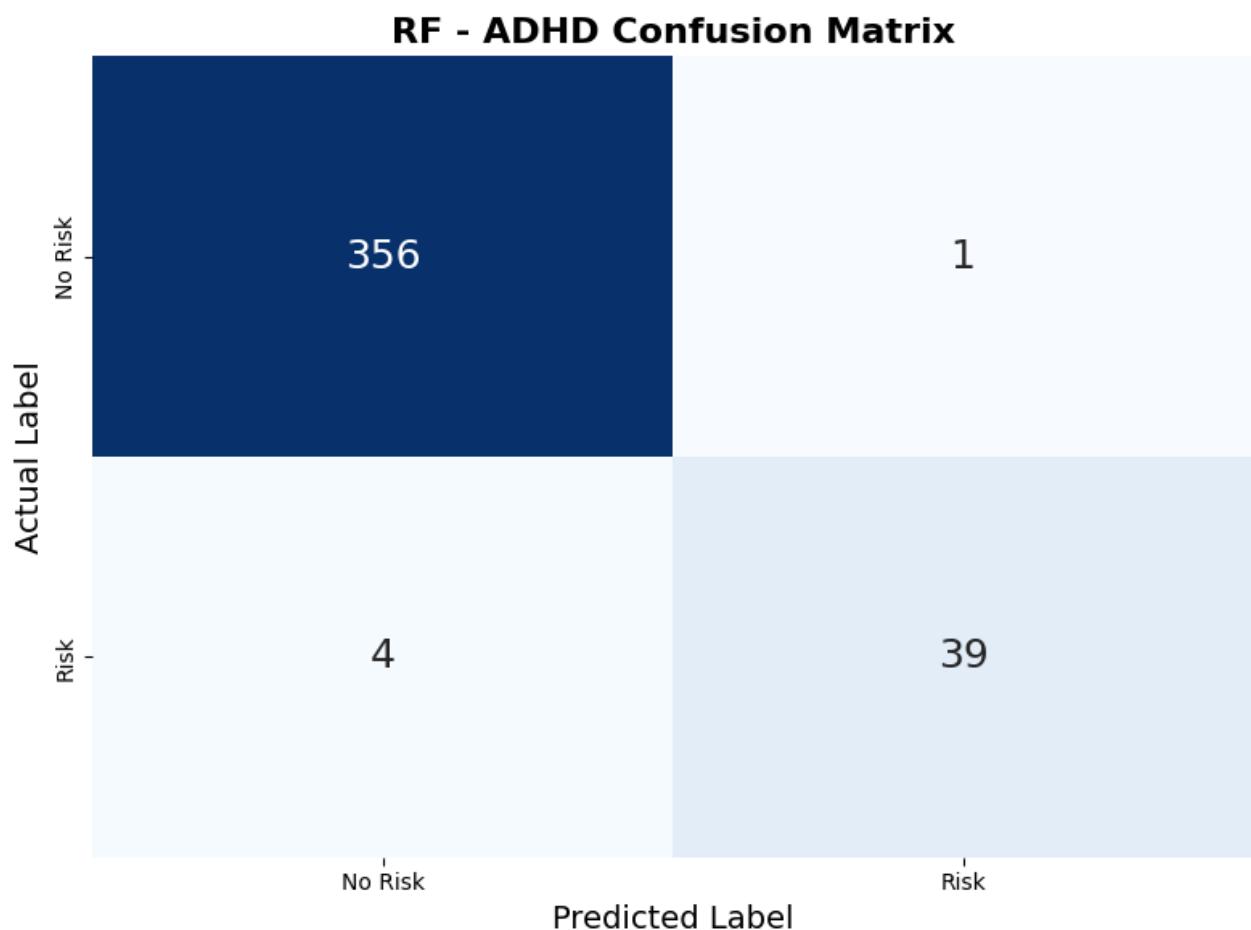


Model Performance Analysis

Final Project Report

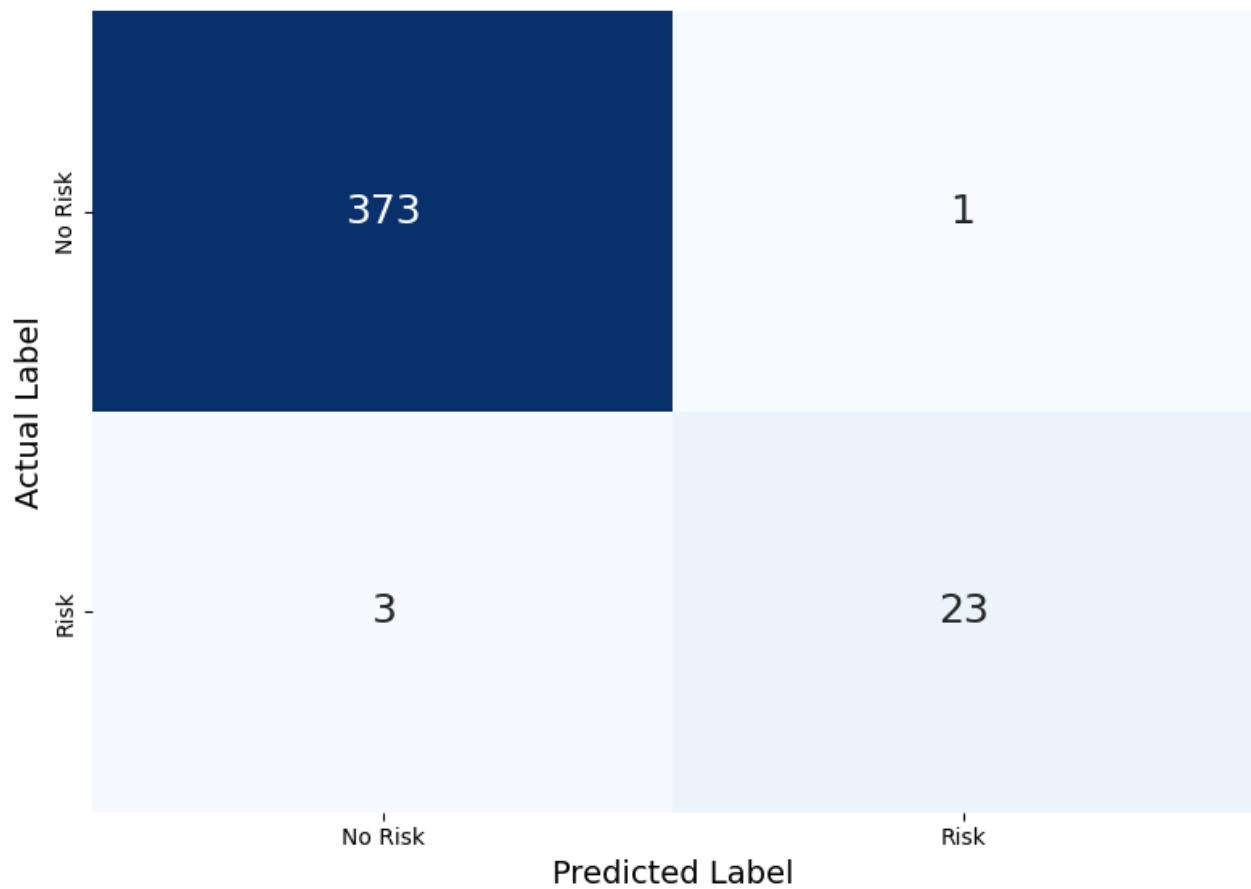
Detailed analysis including individual Confusion Matrices, ROC Curves, Model Comparison, and Rationale for Model Selection.

RF: ADHD Confusion Matrix

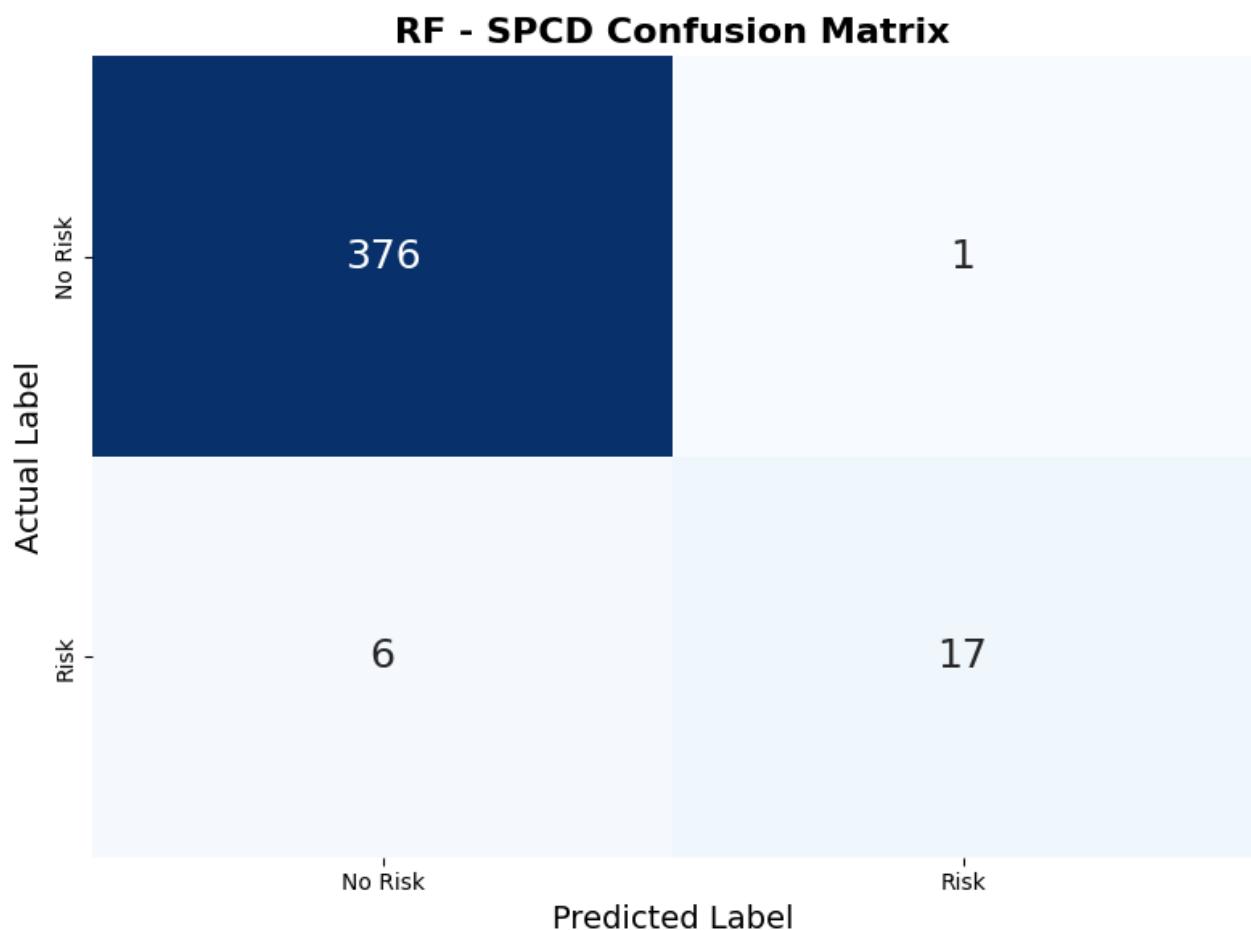


RF: ASD Confusion Matrix

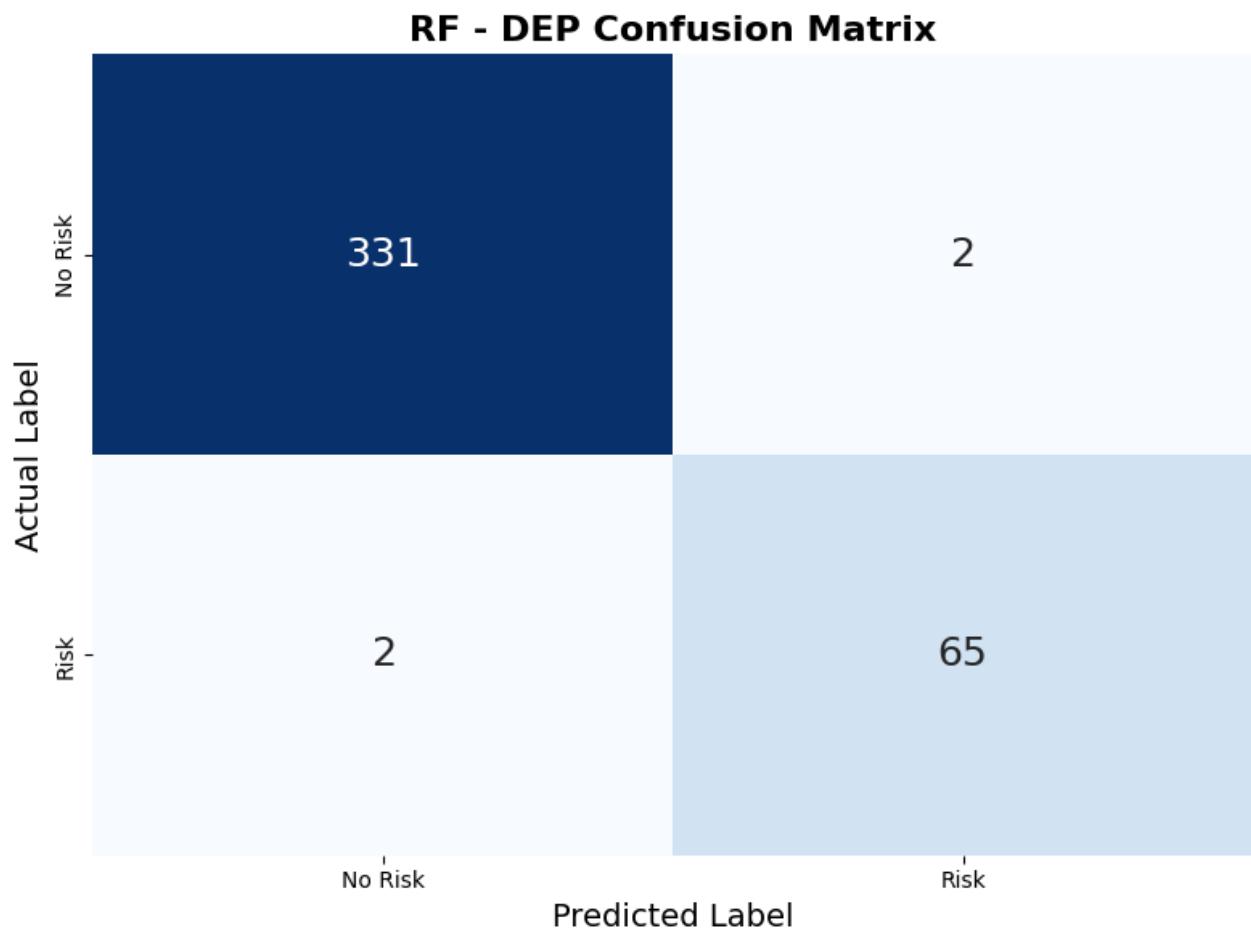
RF - ASD Confusion Matrix



RF: SPCD Confusion Matrix

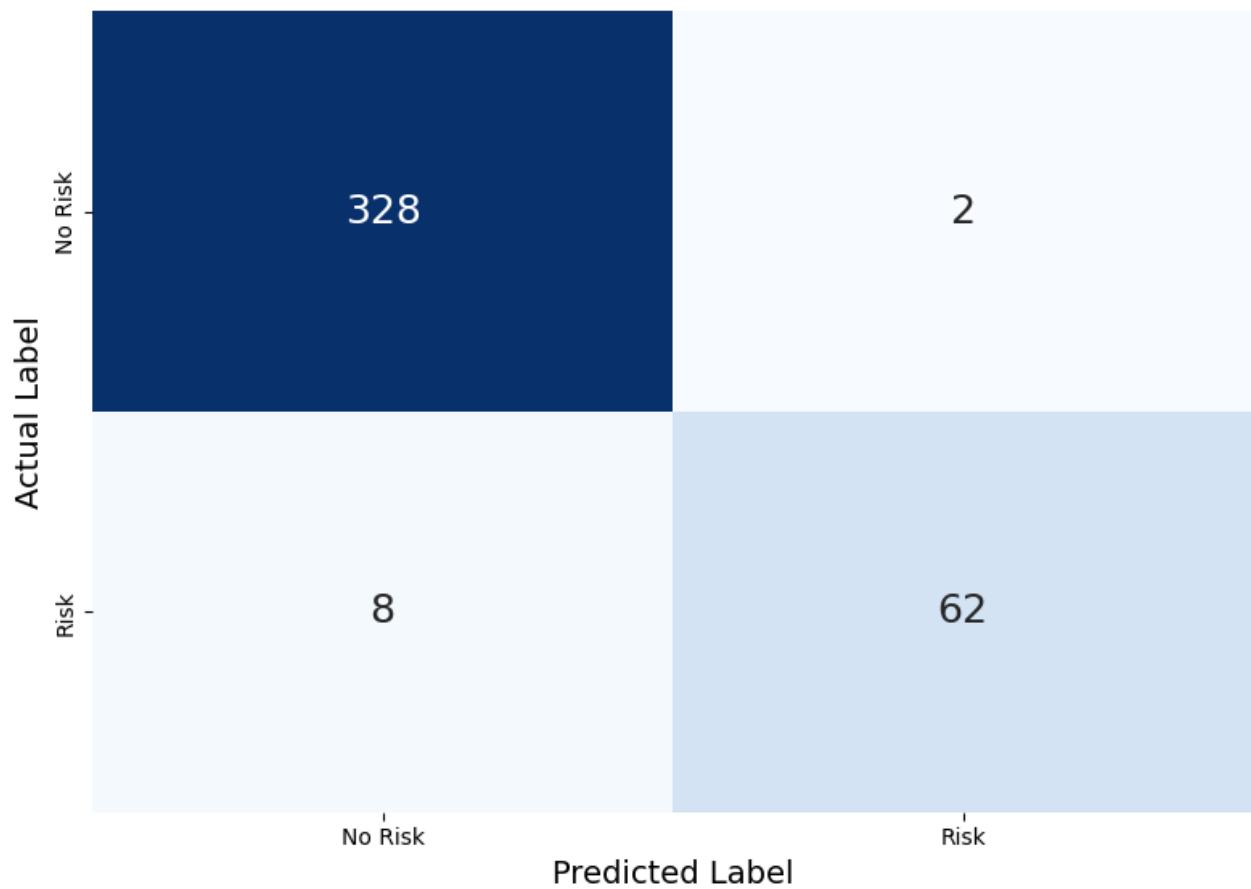


RF: DEP Confusion Matrix

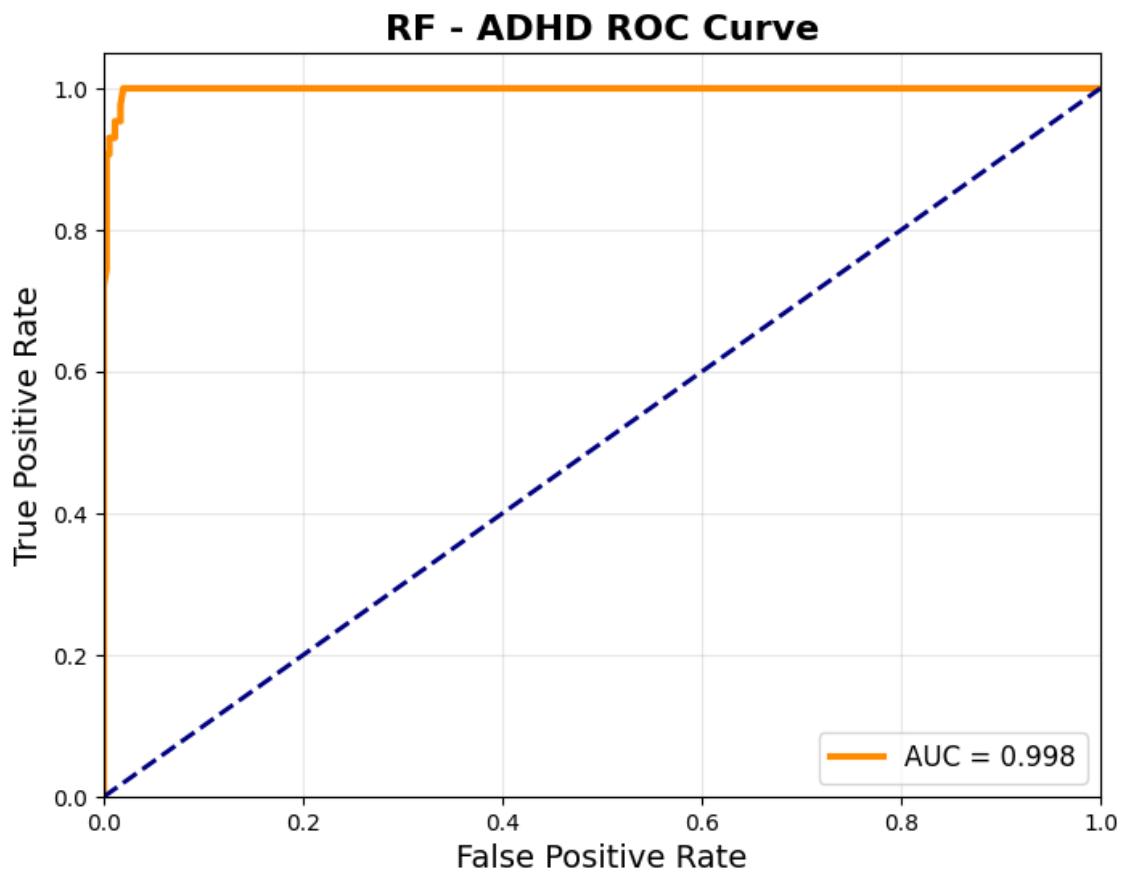


RF: ANX Confusion Matrix

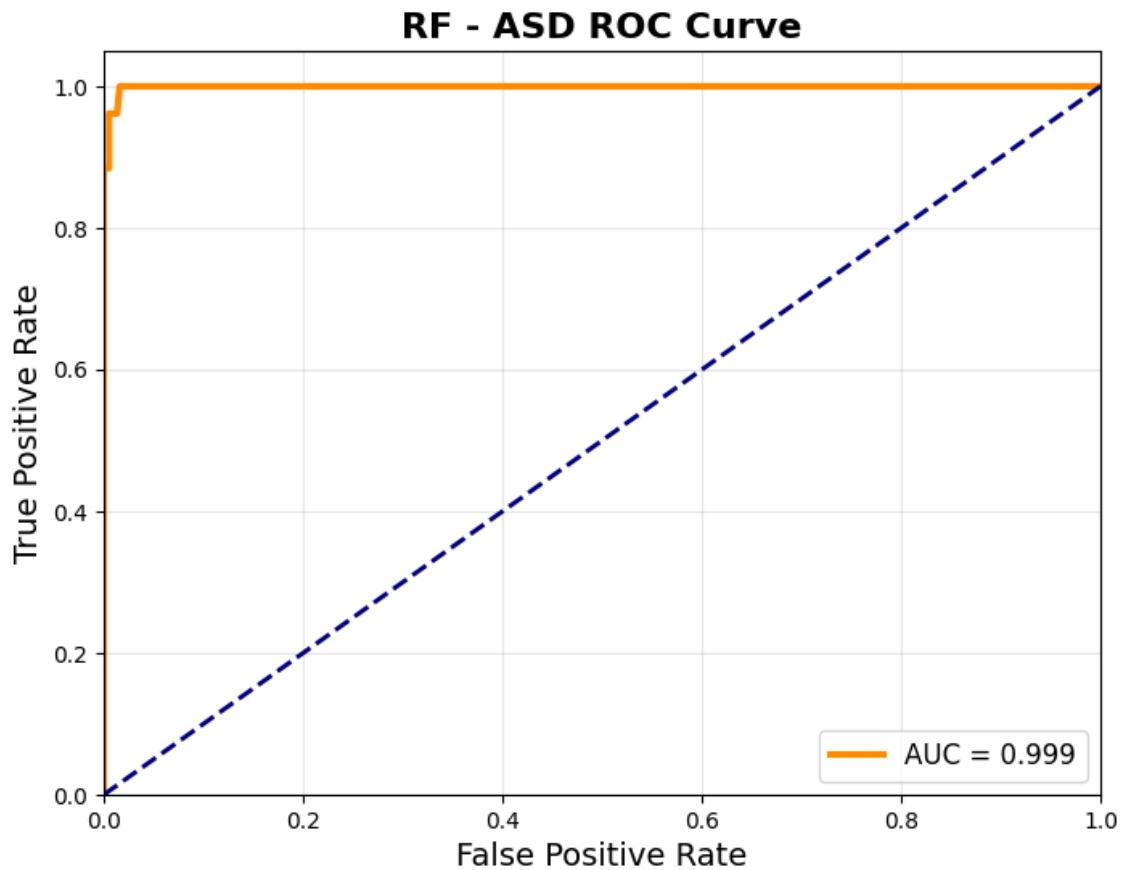
RF - ANX Confusion Matrix



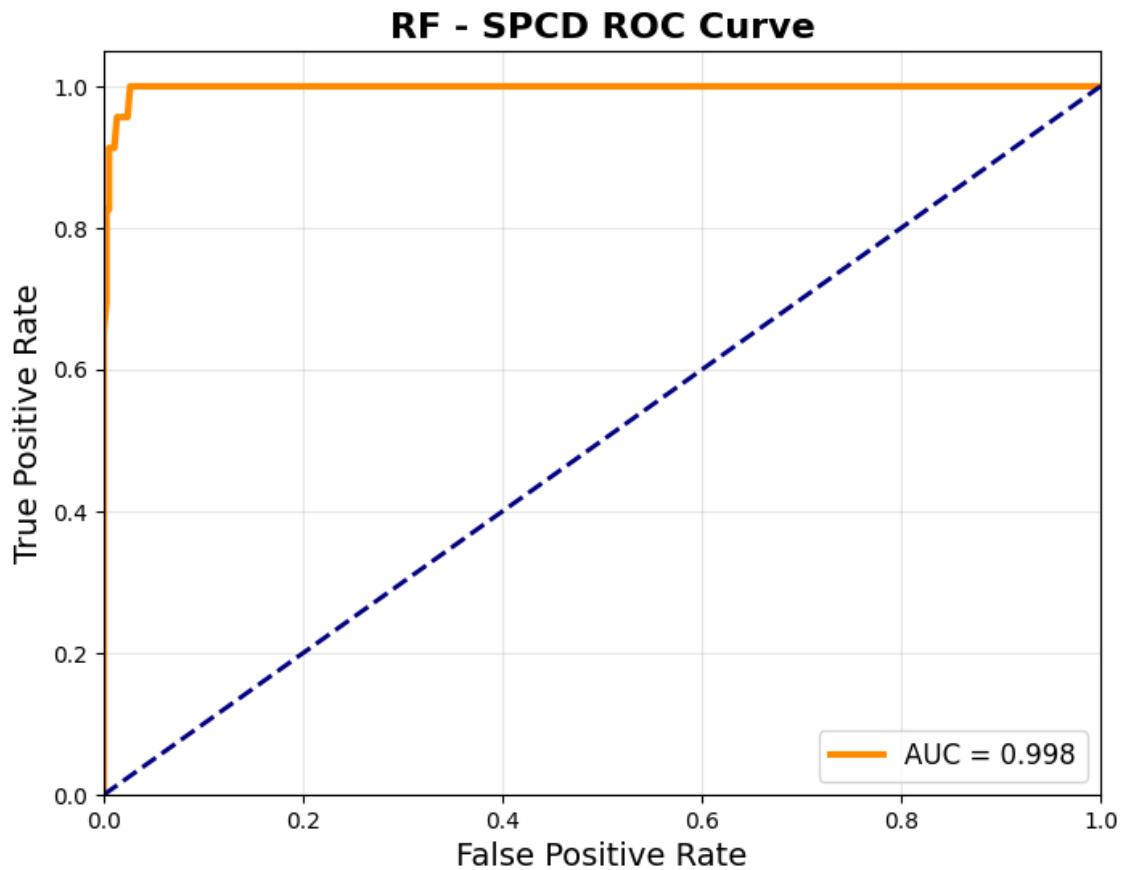
RF: ADHD ROC Curve



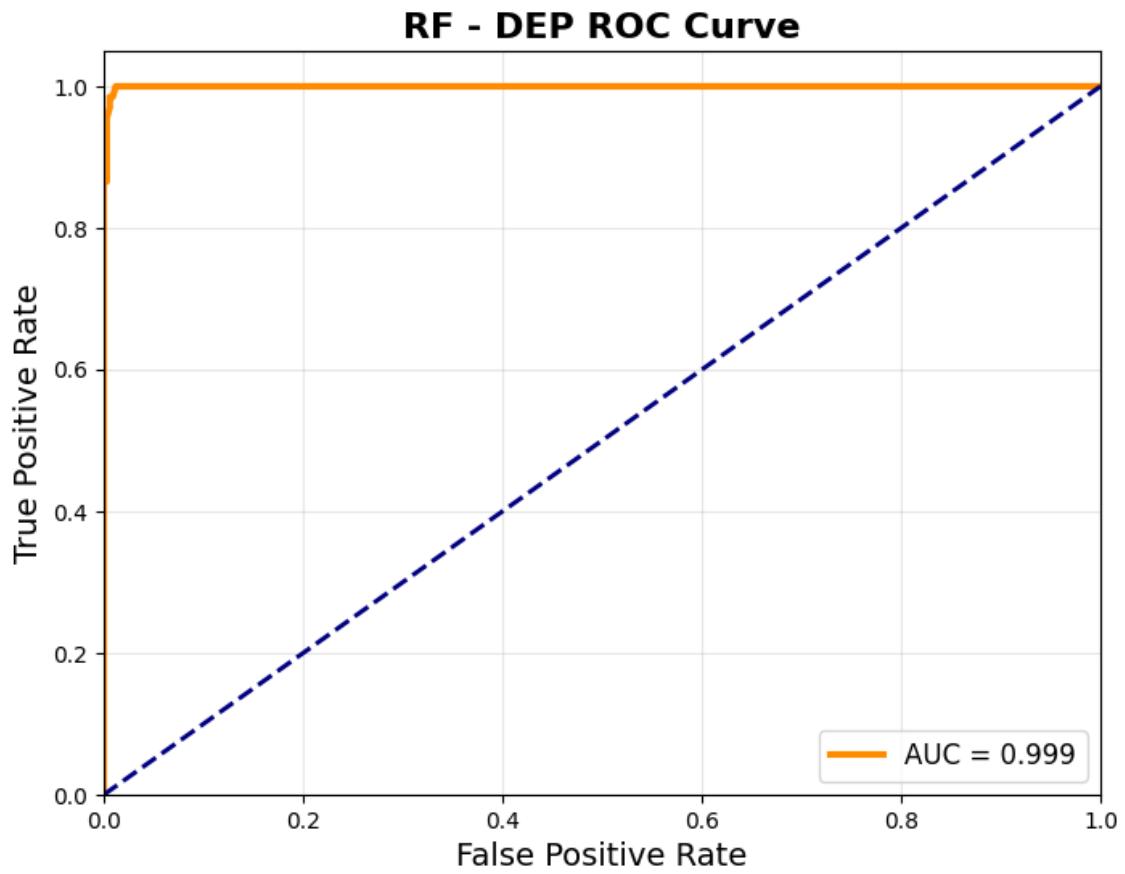
RF: ASD ROC Curve



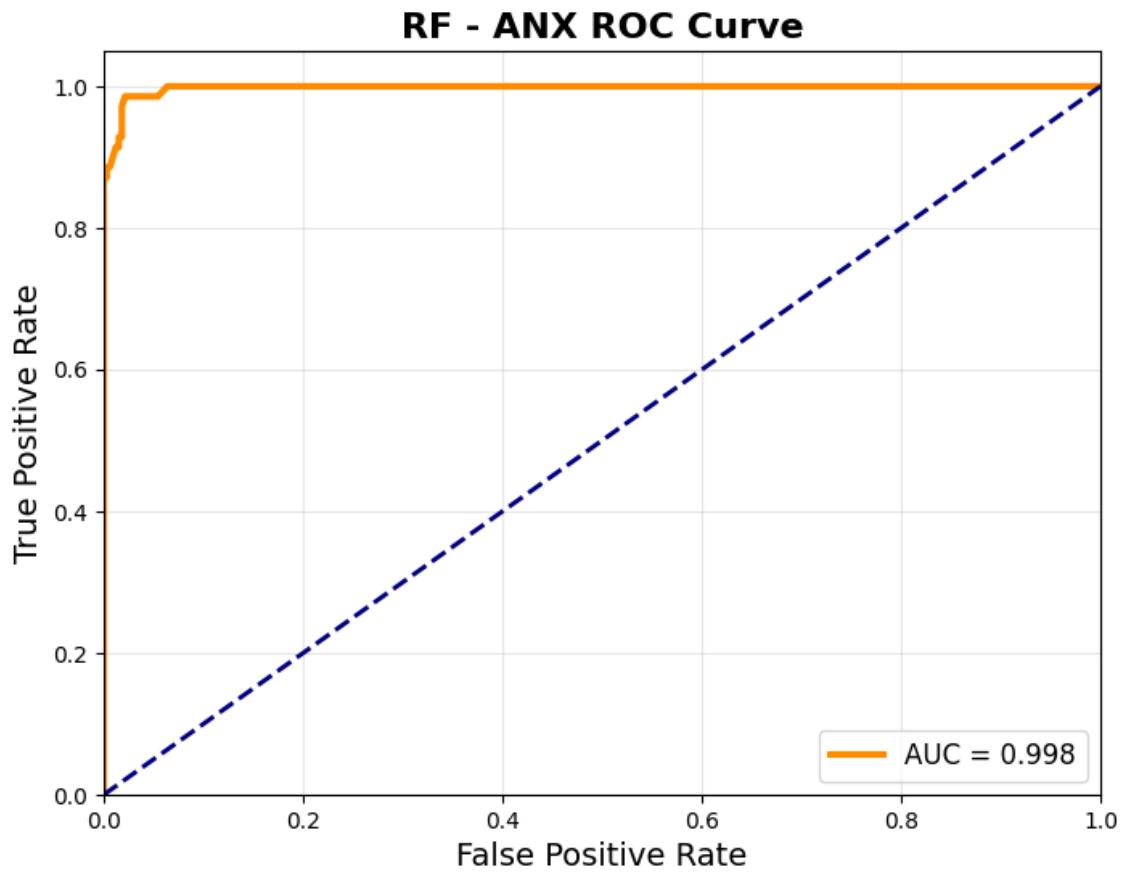
RF: SPCD ROC Curve



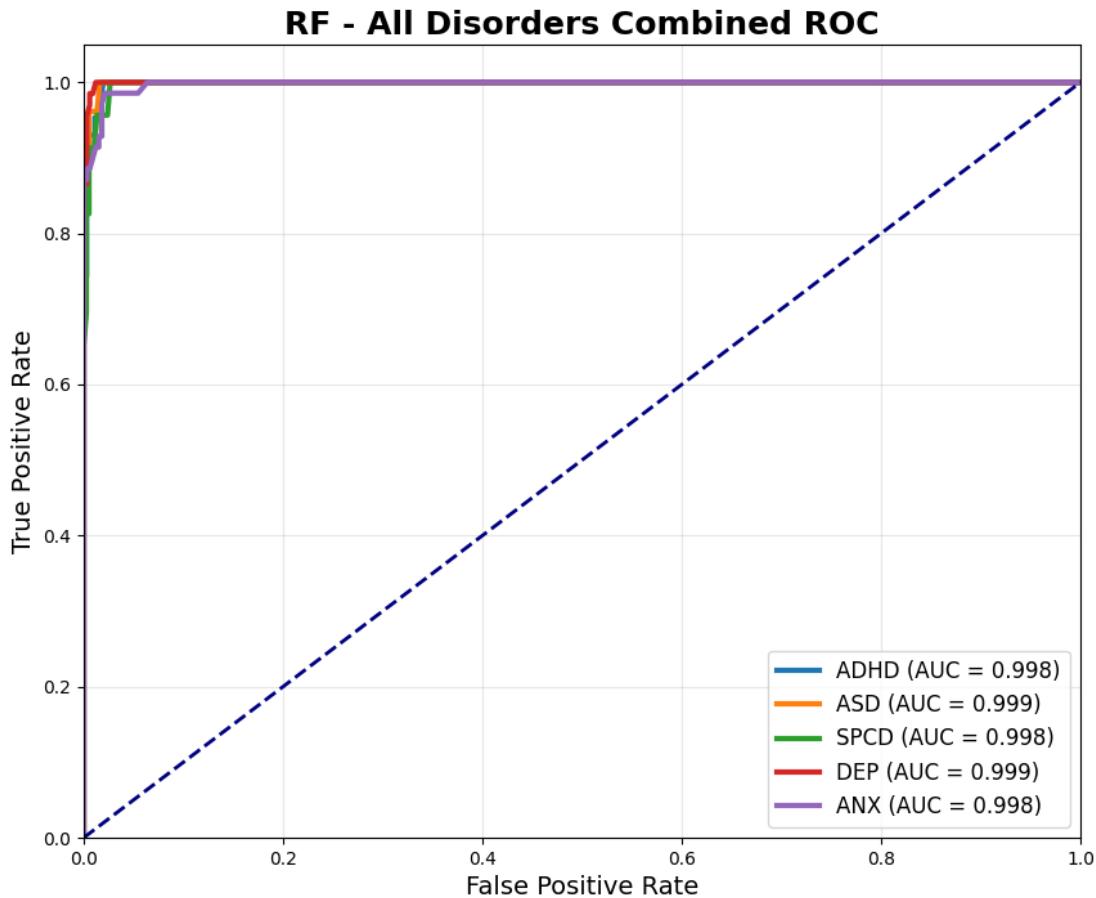
RF: DEP ROC Curve



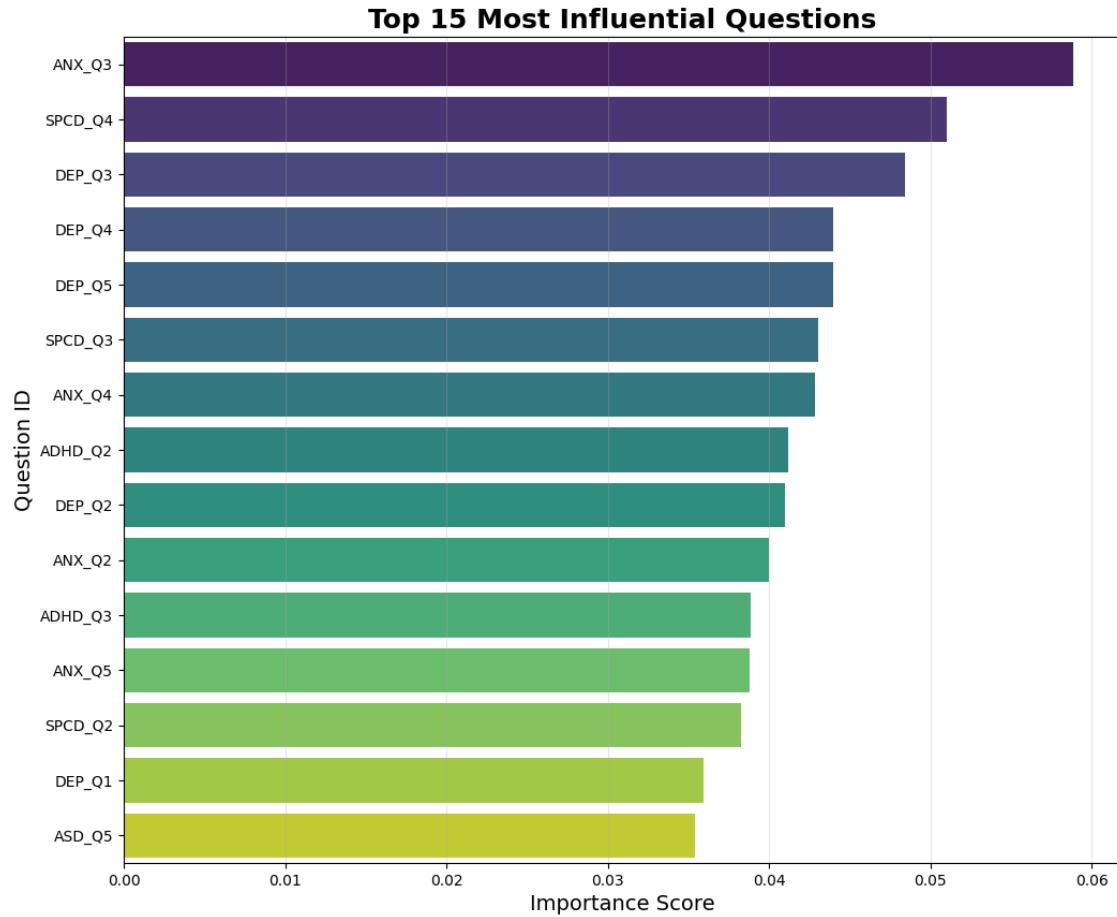
RF: ANX ROC Curve



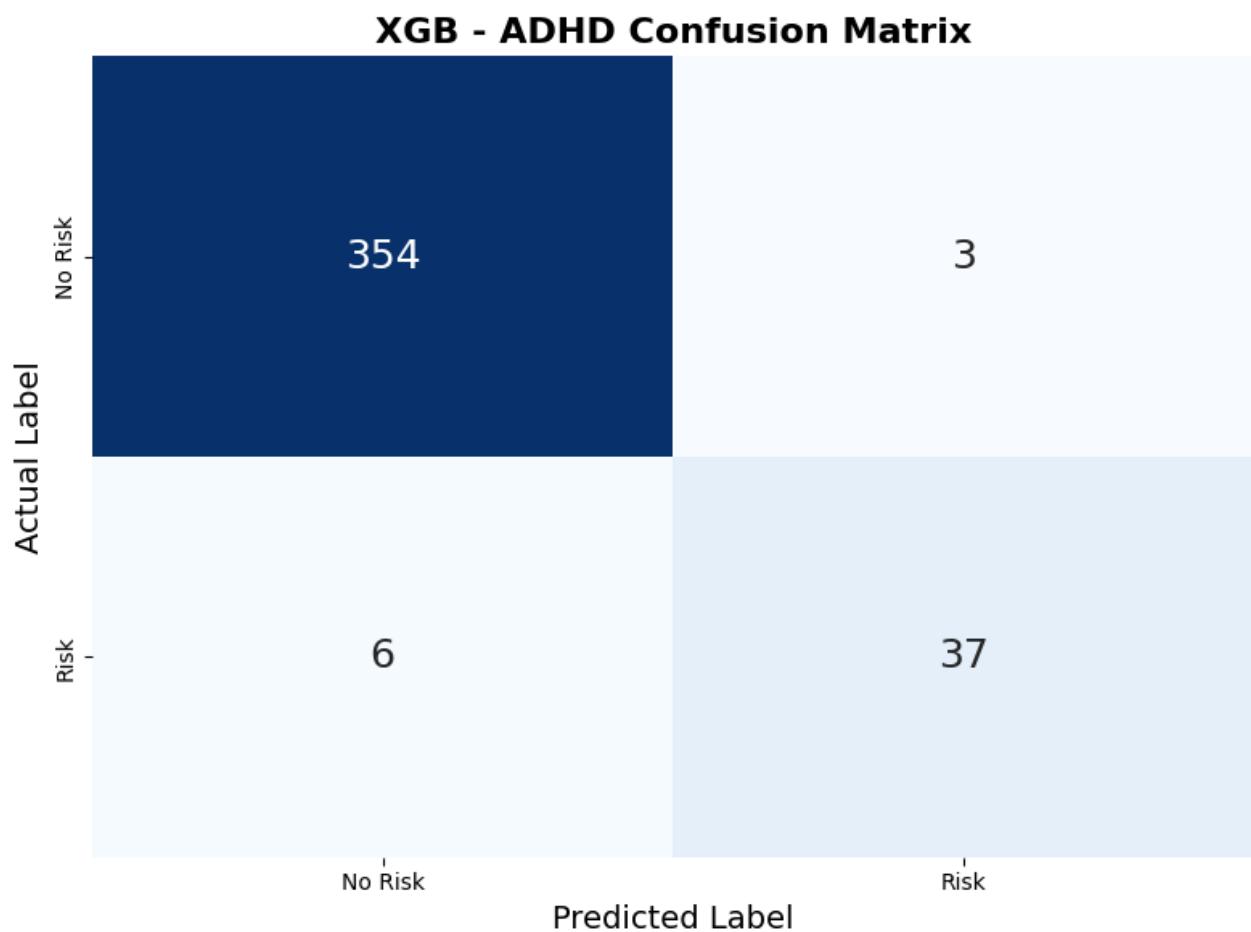
RF: Combined ROC Curve (All Disorders)



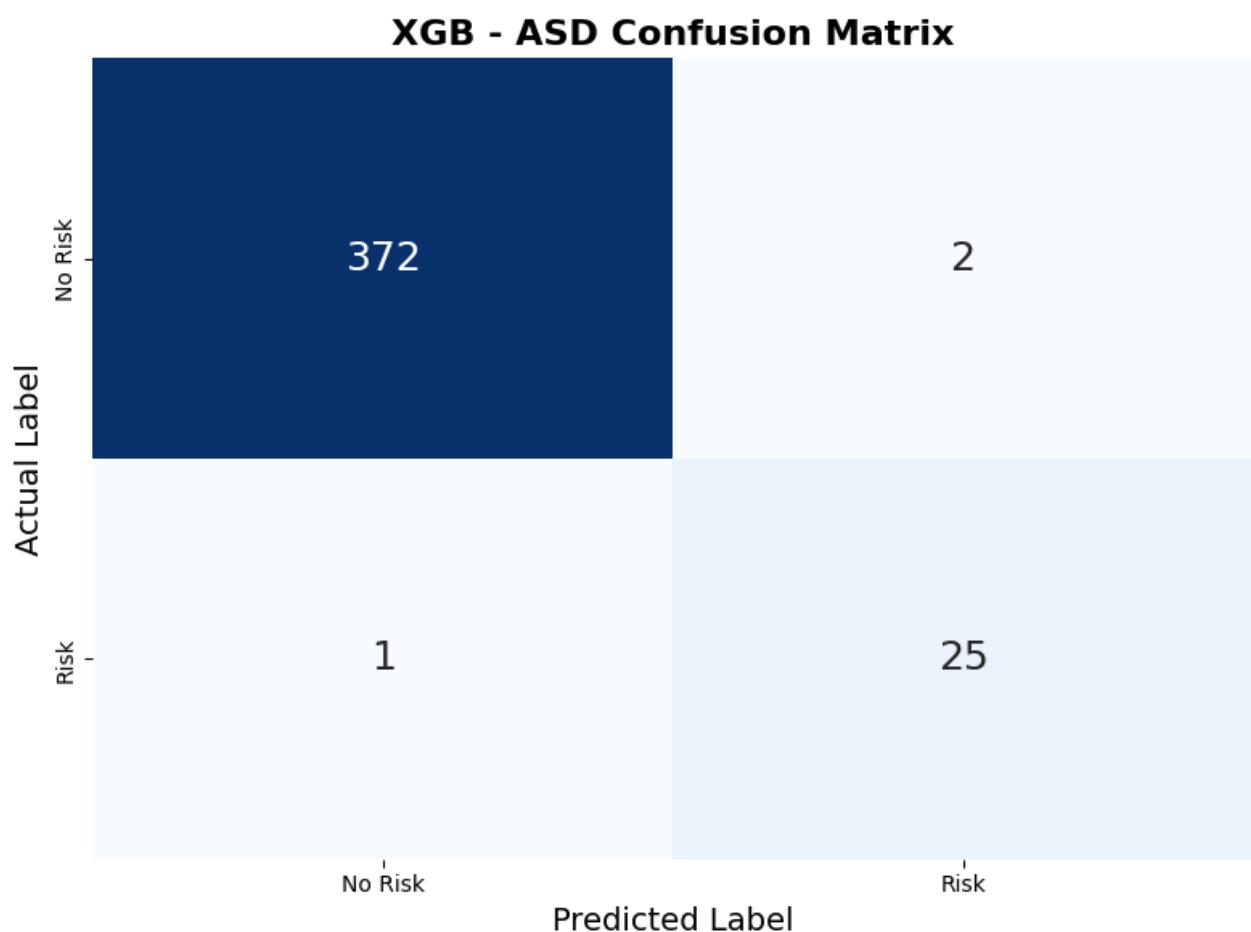
Random Forest Feature Importance



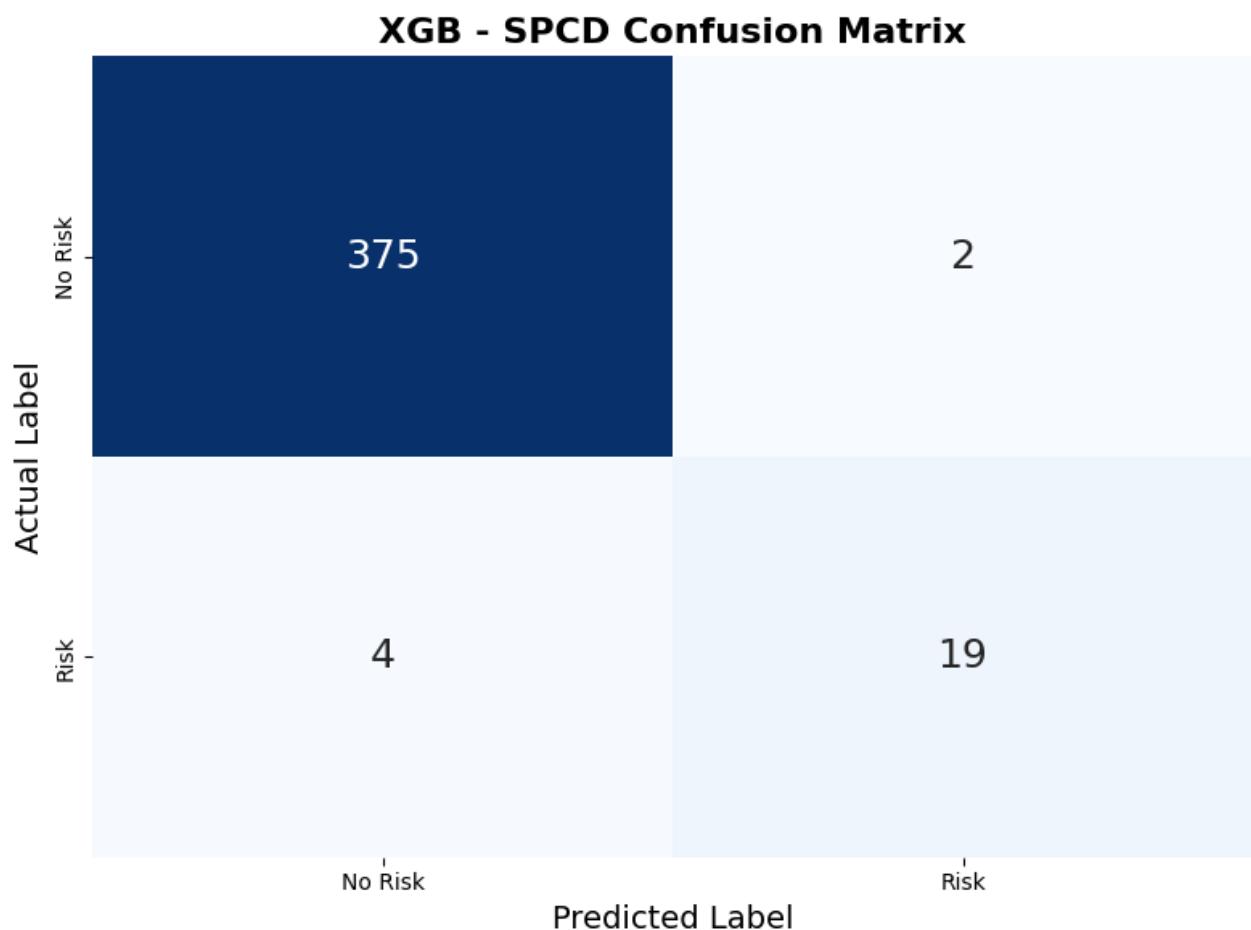
XGB: ADHD Confusion Matrix



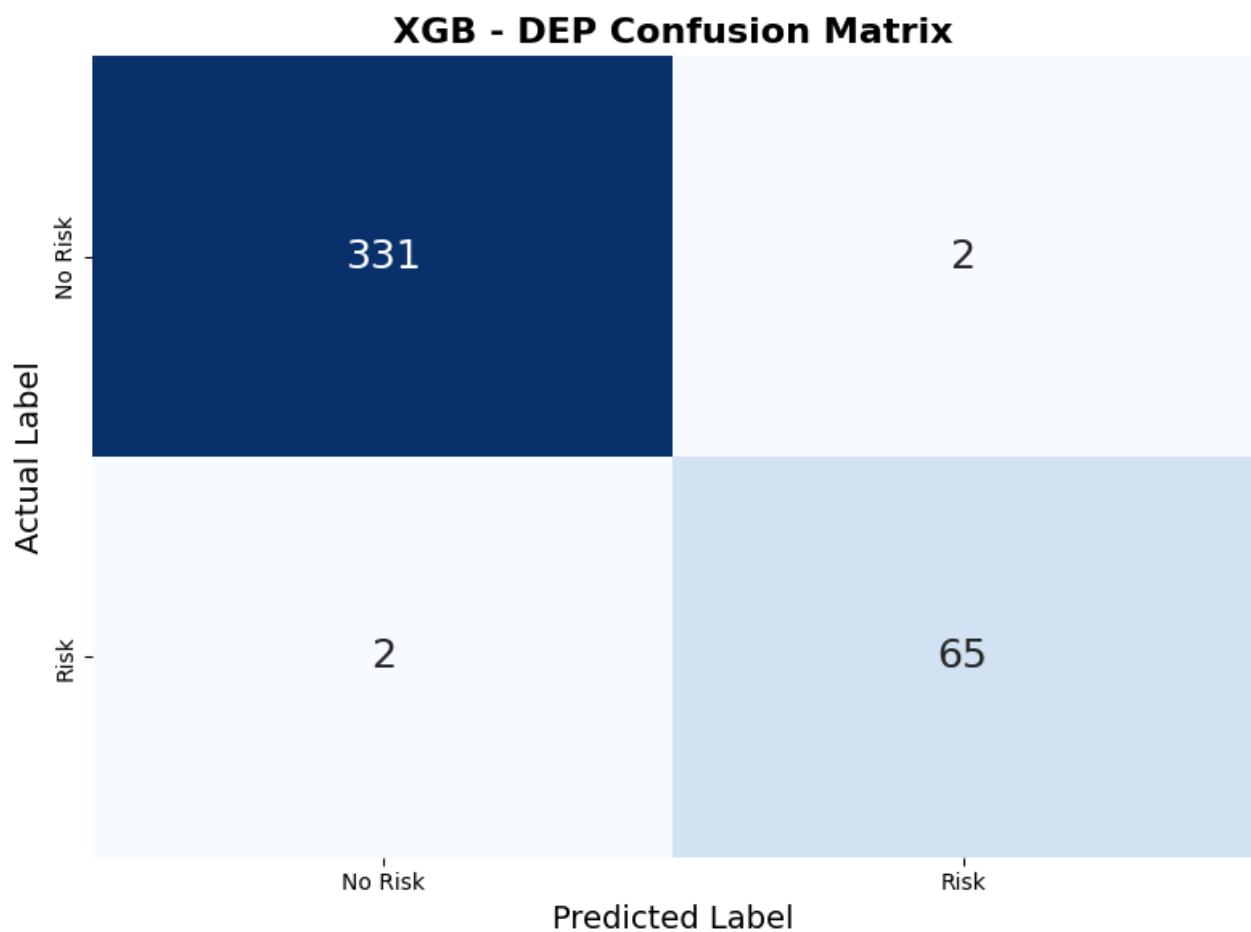
XGB: ASD Confusion Matrix



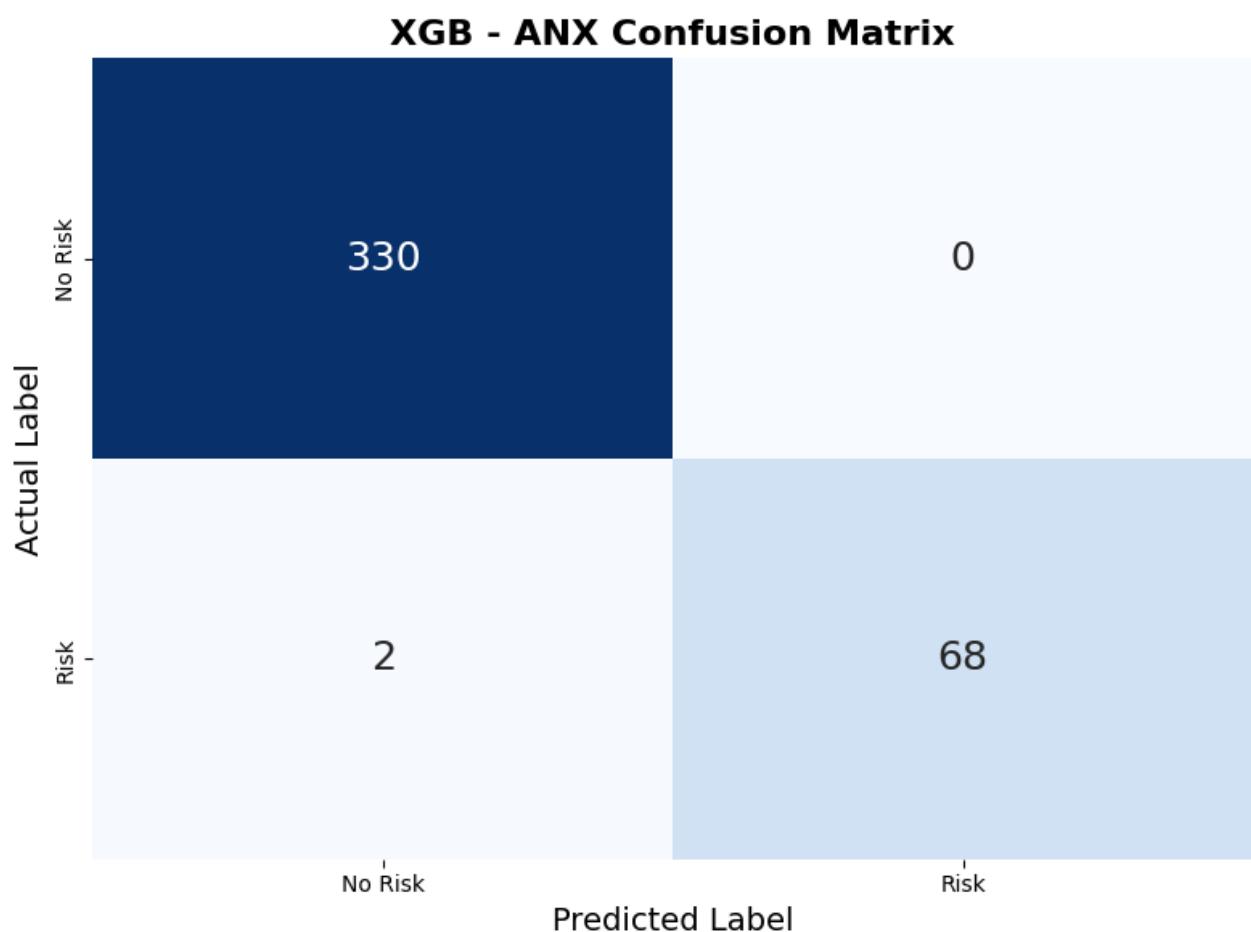
XGB: SPCD Confusion Matrix



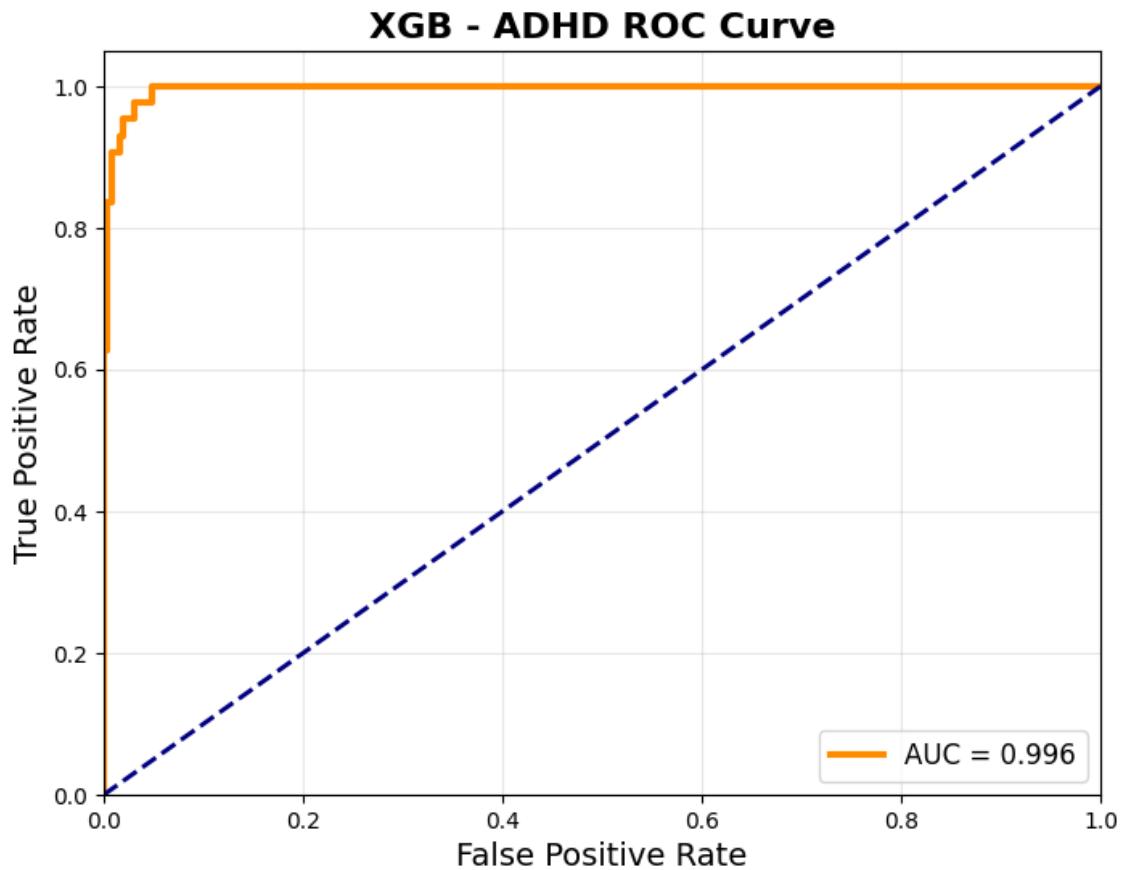
XGB: DEP Confusion Matrix



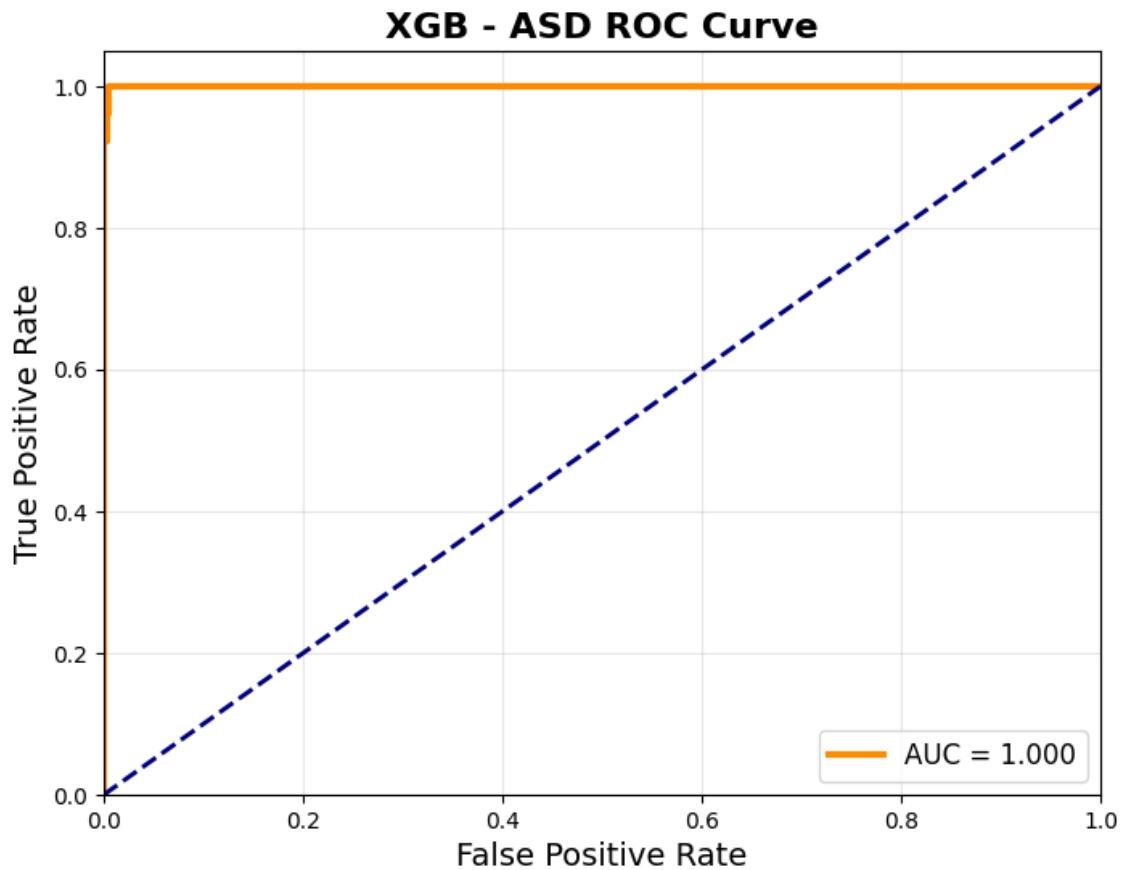
XGB: ANX Confusion Matrix



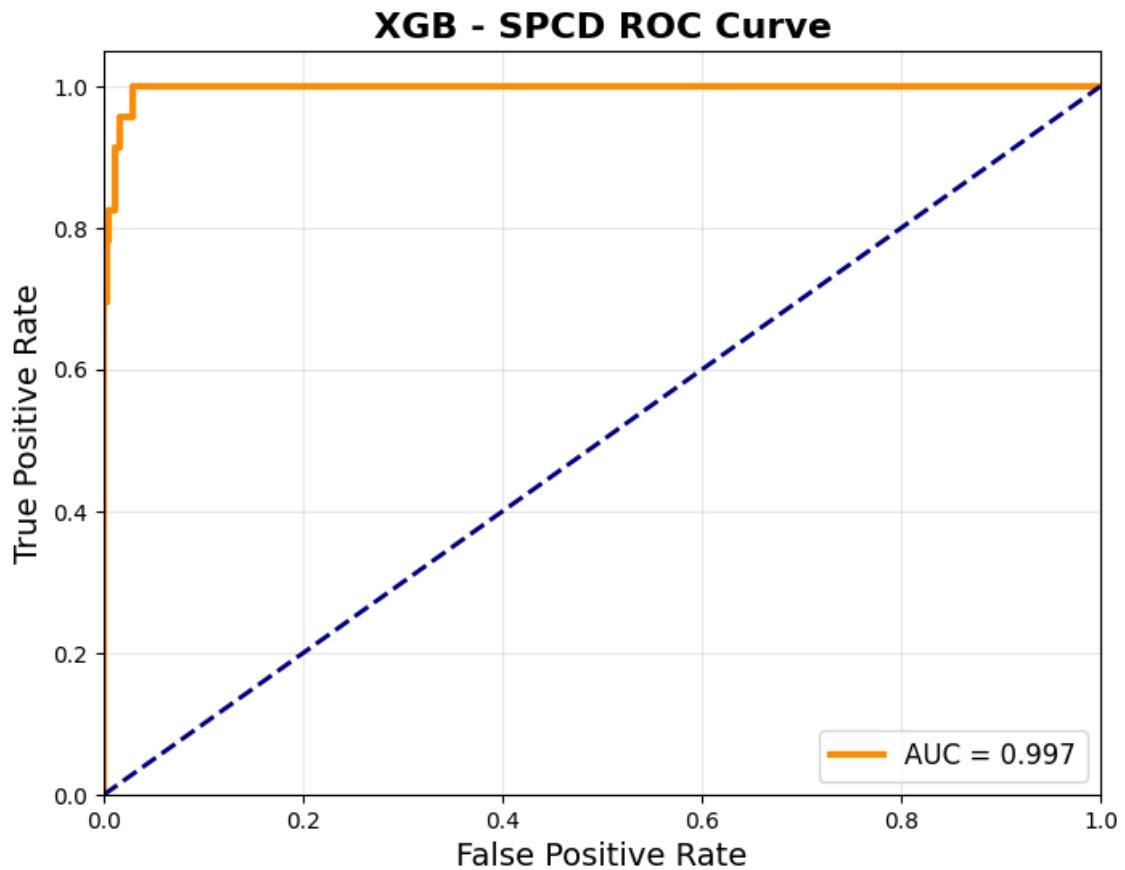
XGB: ADHD ROC Curve



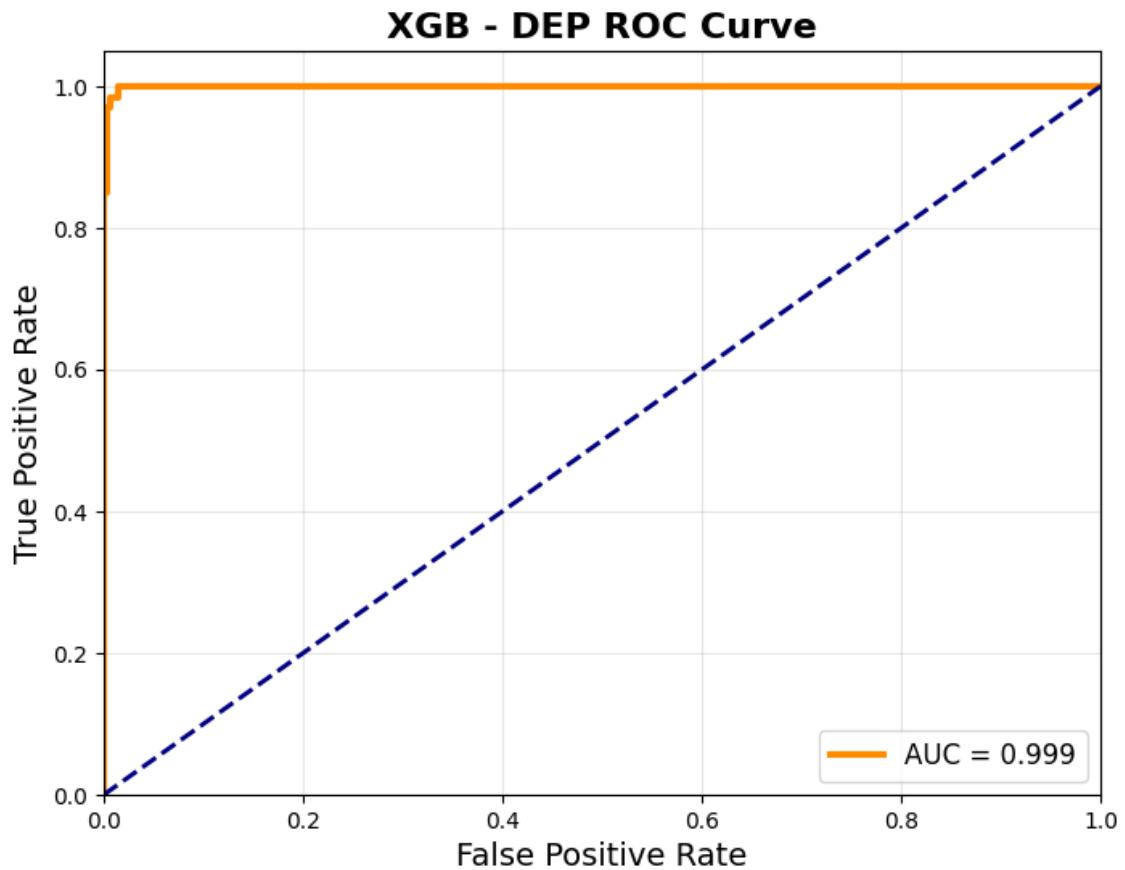
XGB: ASD ROC Curve



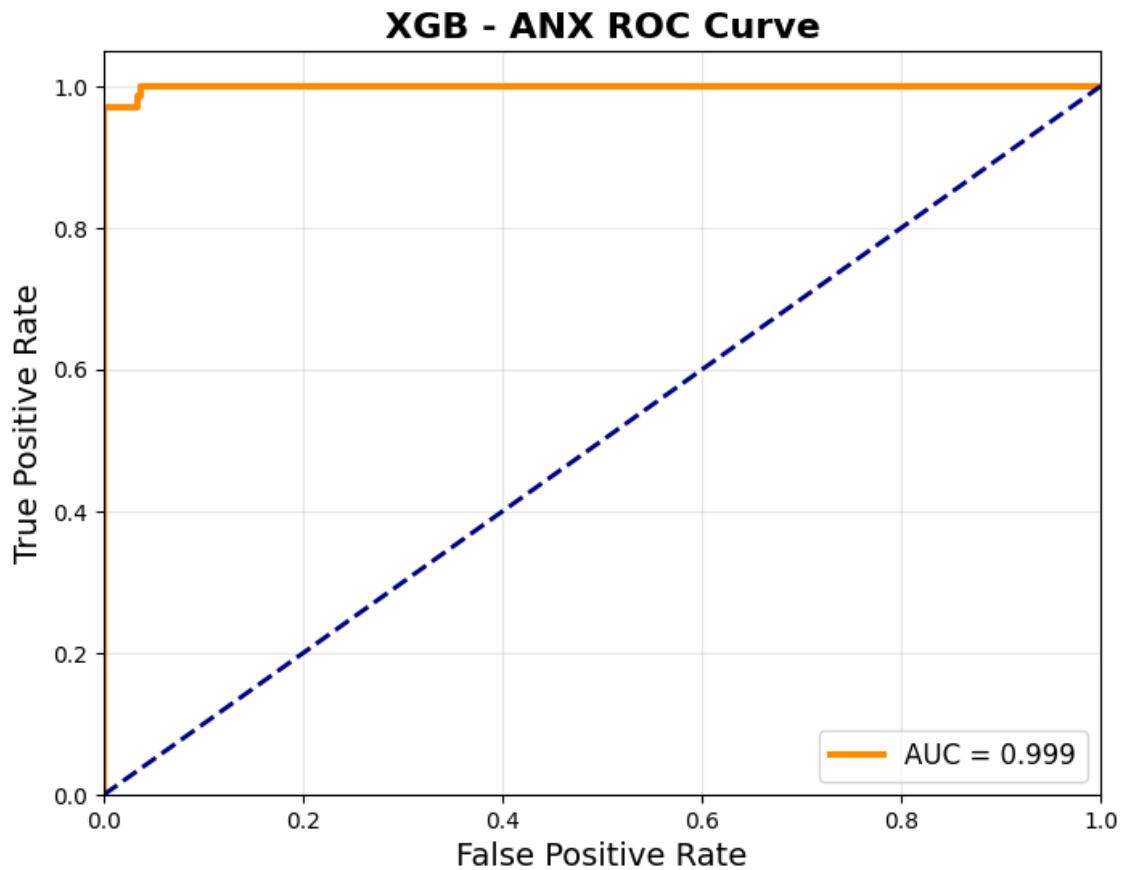
XGB: SPCD ROC Curve



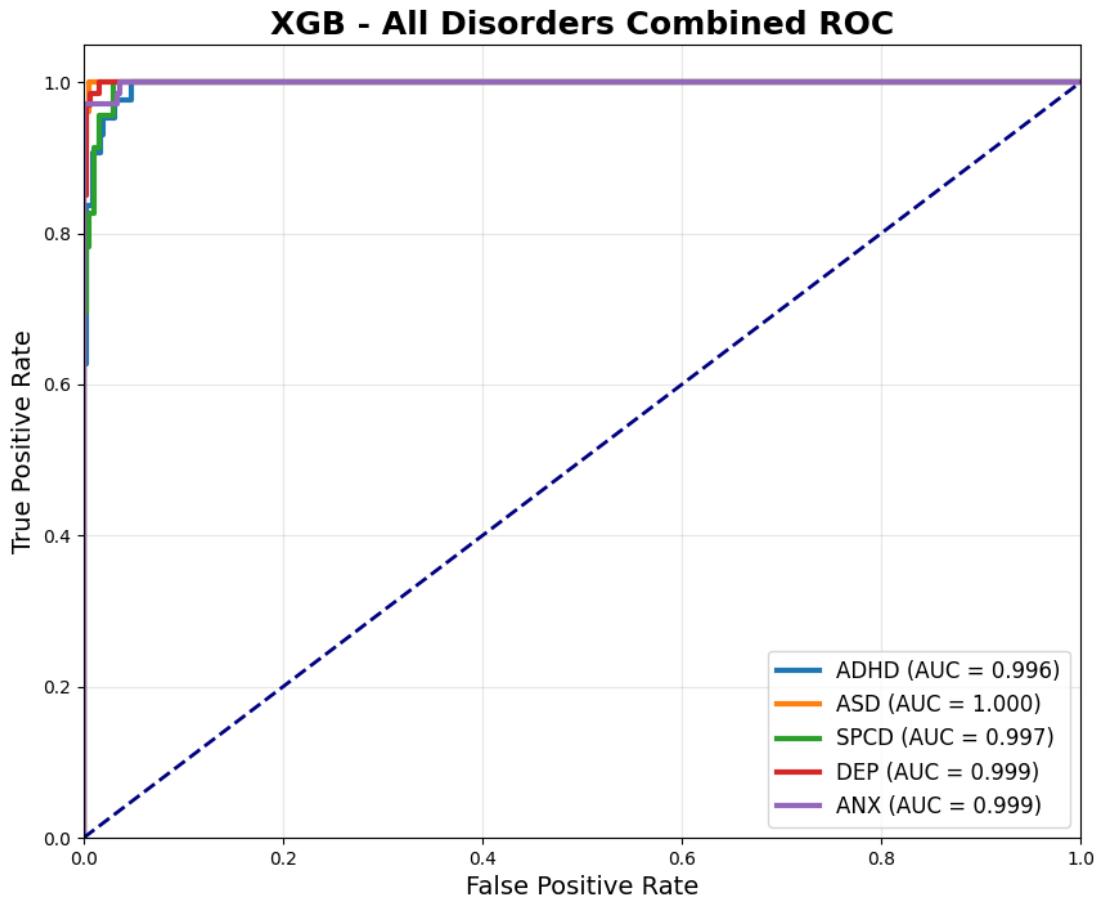
XGB: DEP ROC Curve



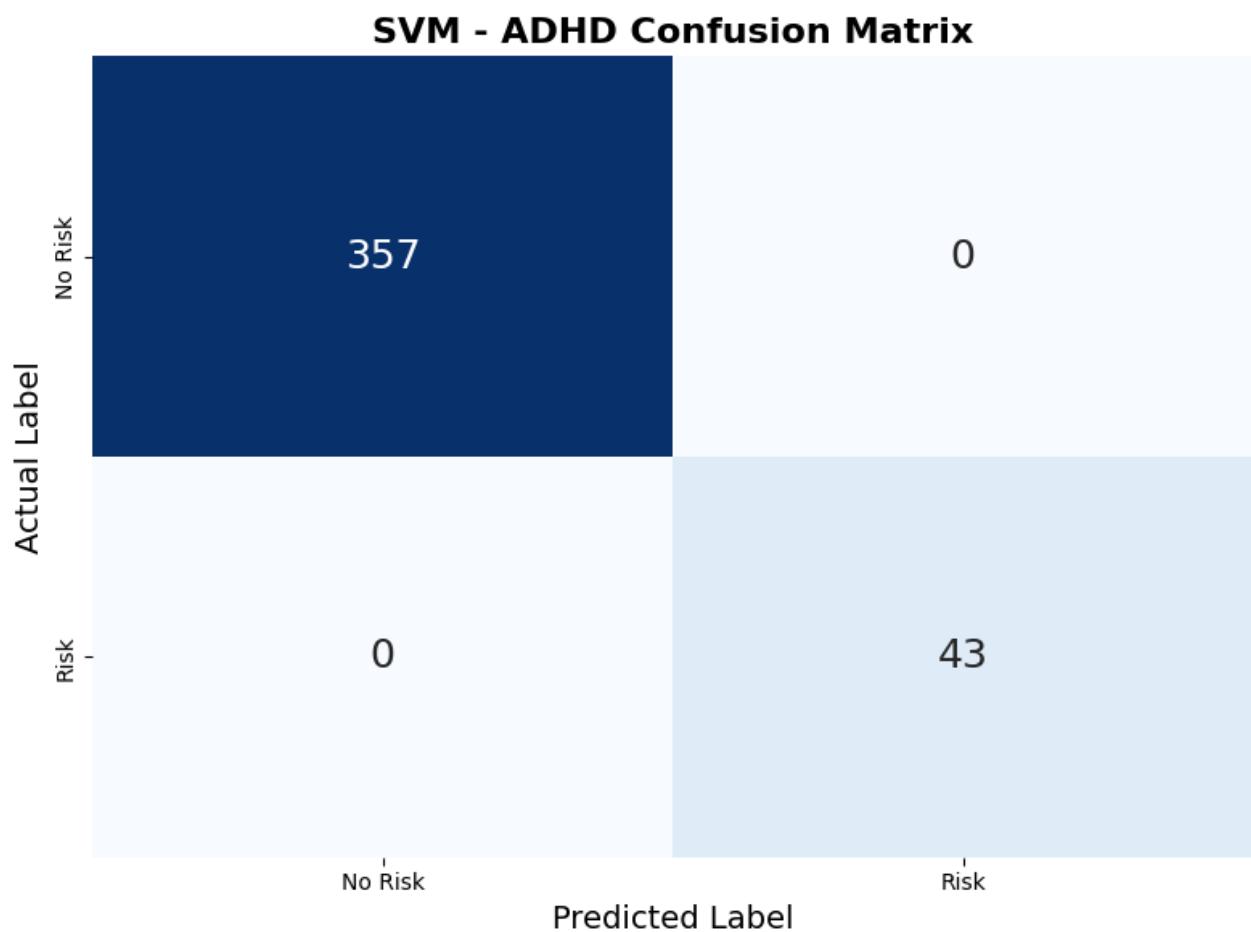
XGB: ANX ROC Curve



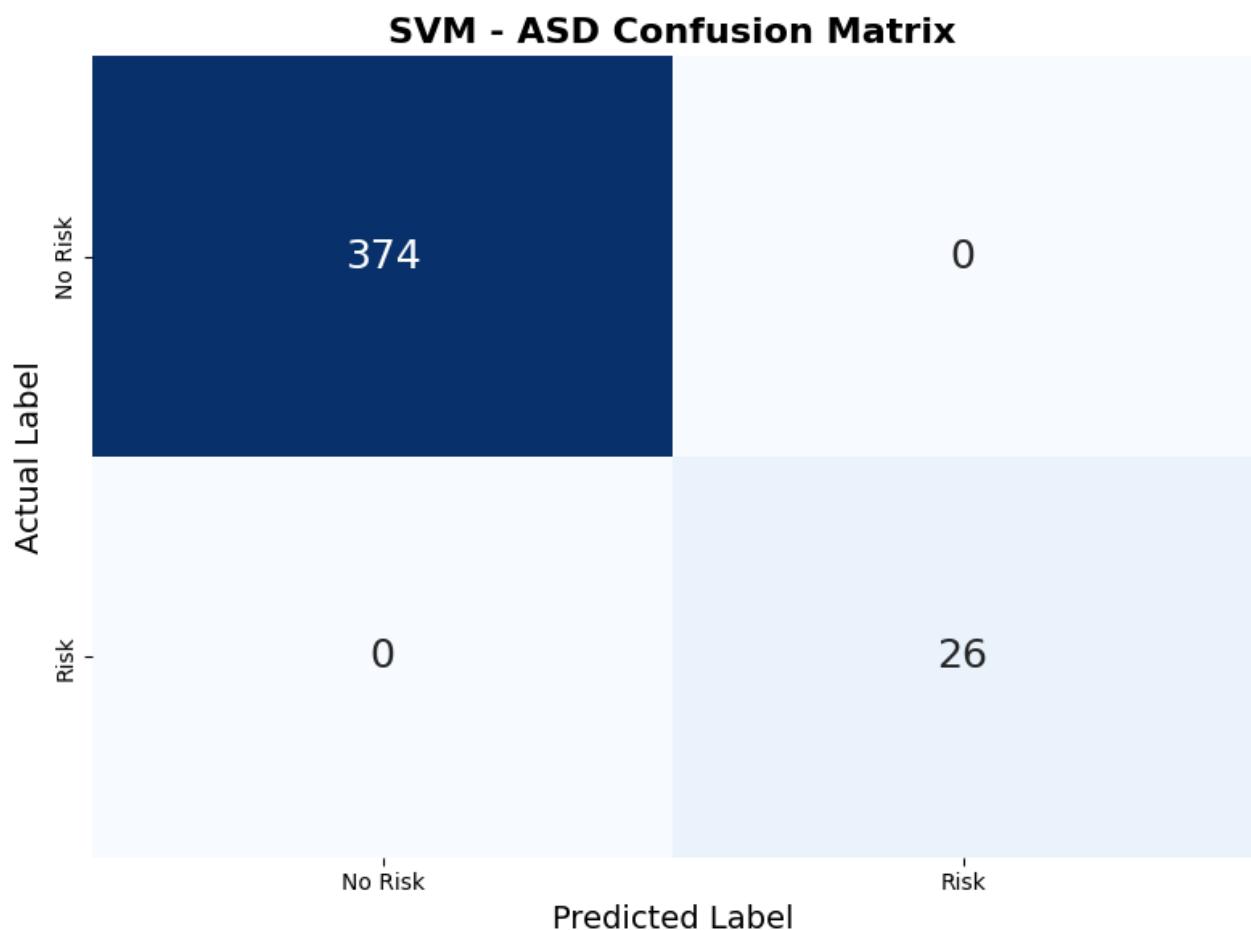
XGB: Combined ROC Curve (All Disorders)



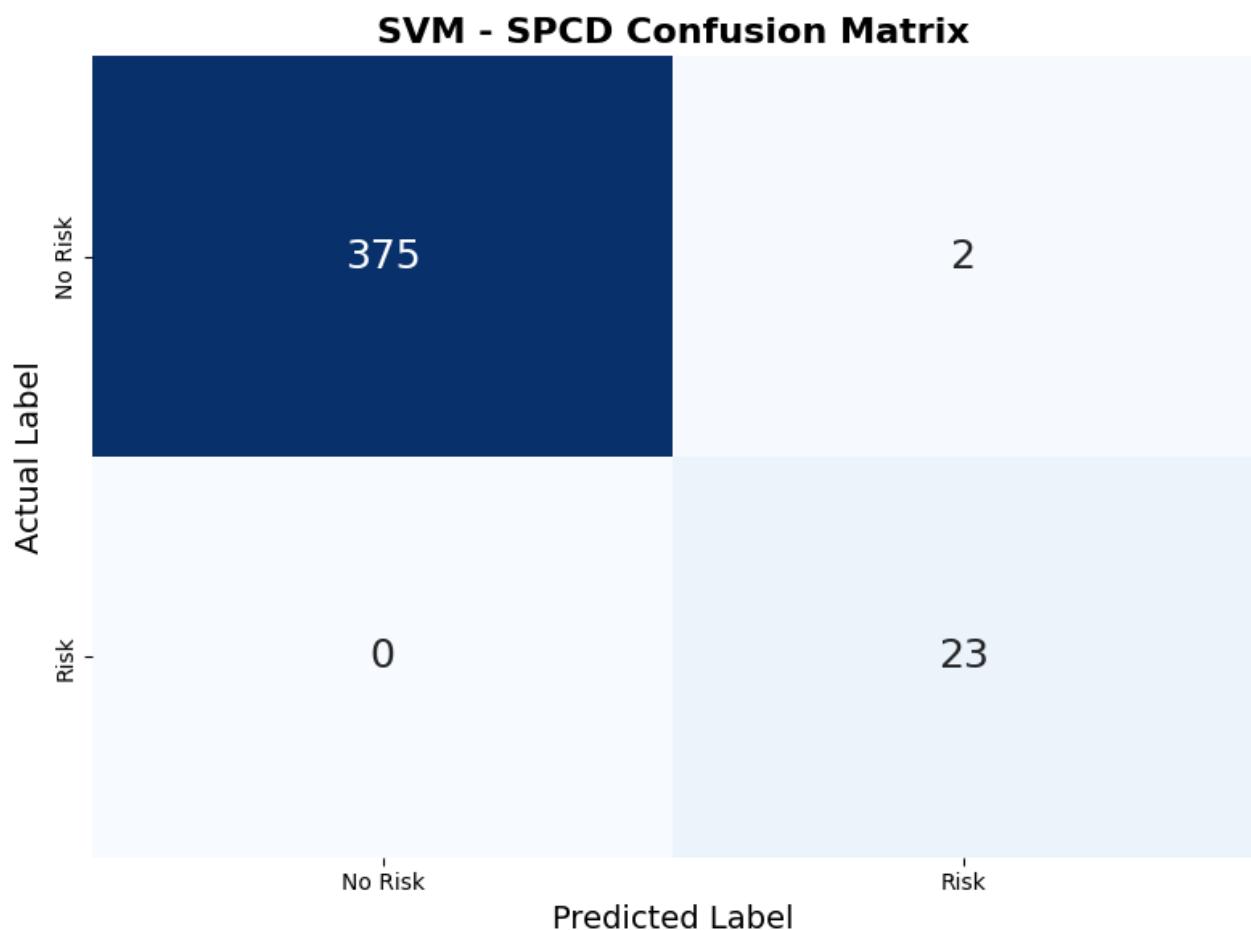
SVM: ADHD Confusion Matrix



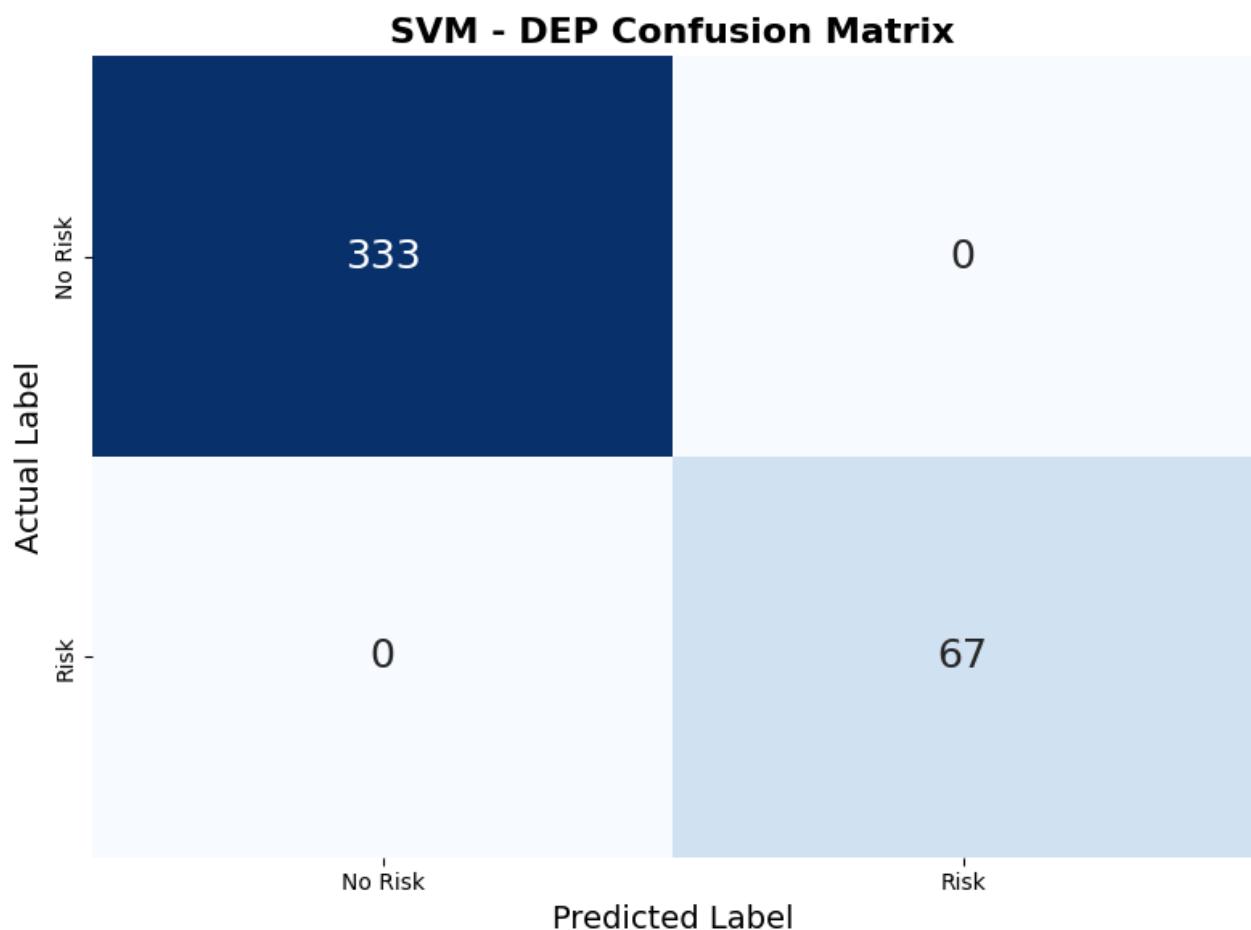
SVM: ASD Confusion Matrix



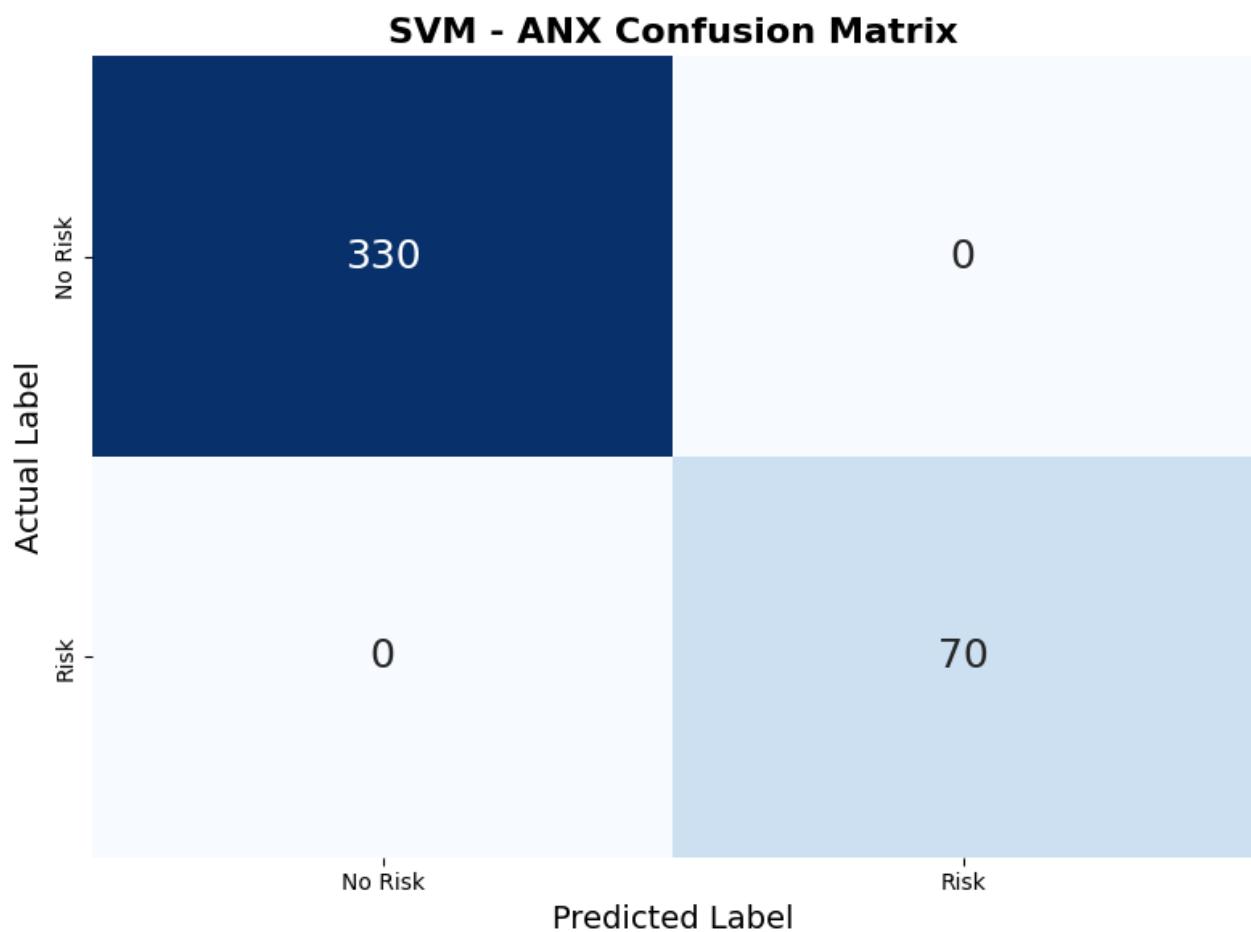
SVM: SPCD Confusion Matrix



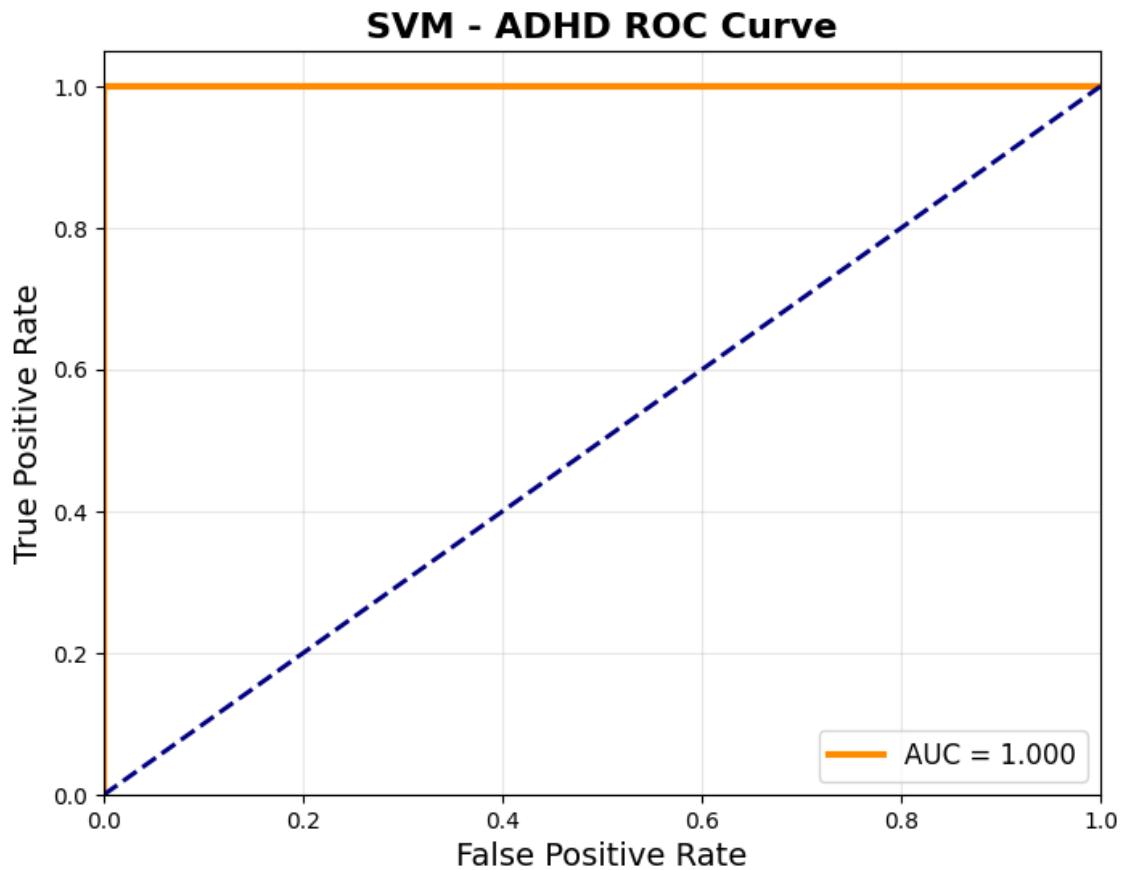
SVM: DEP Confusion Matrix



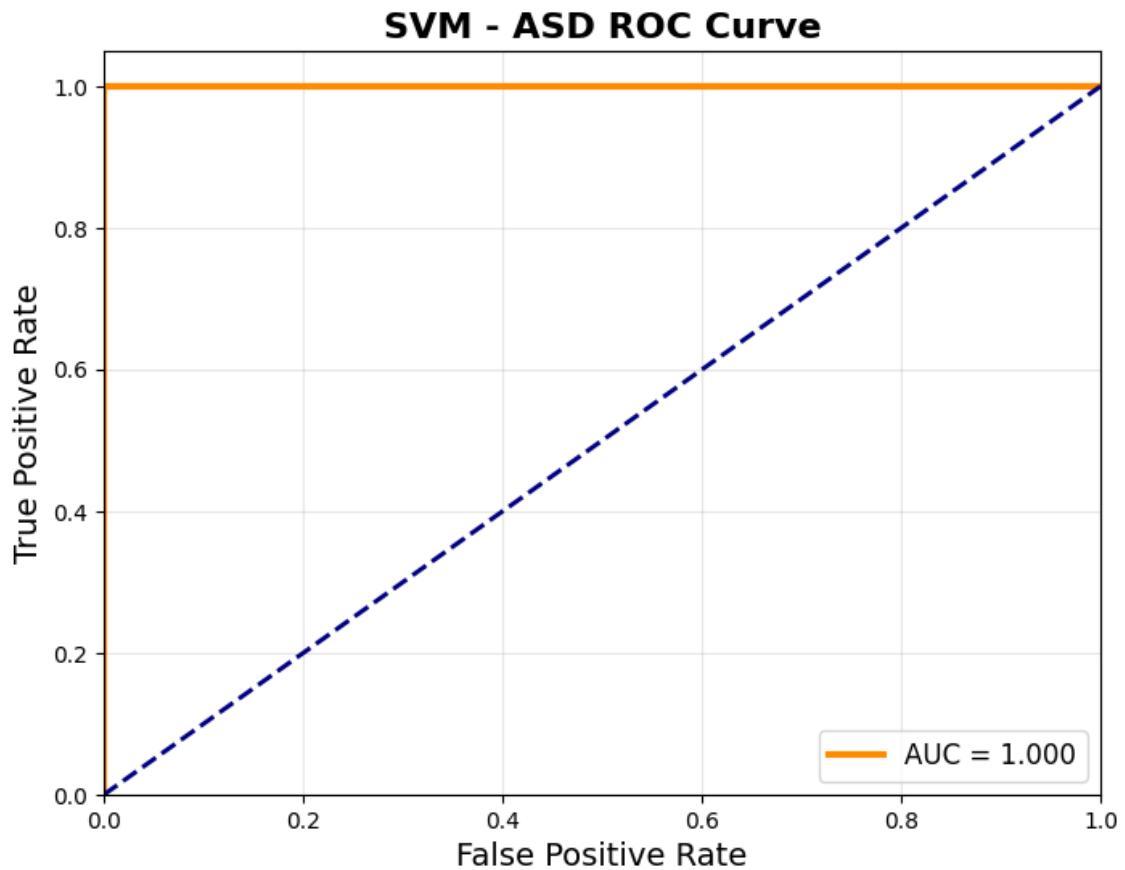
SVM: ANX Confusion Matrix



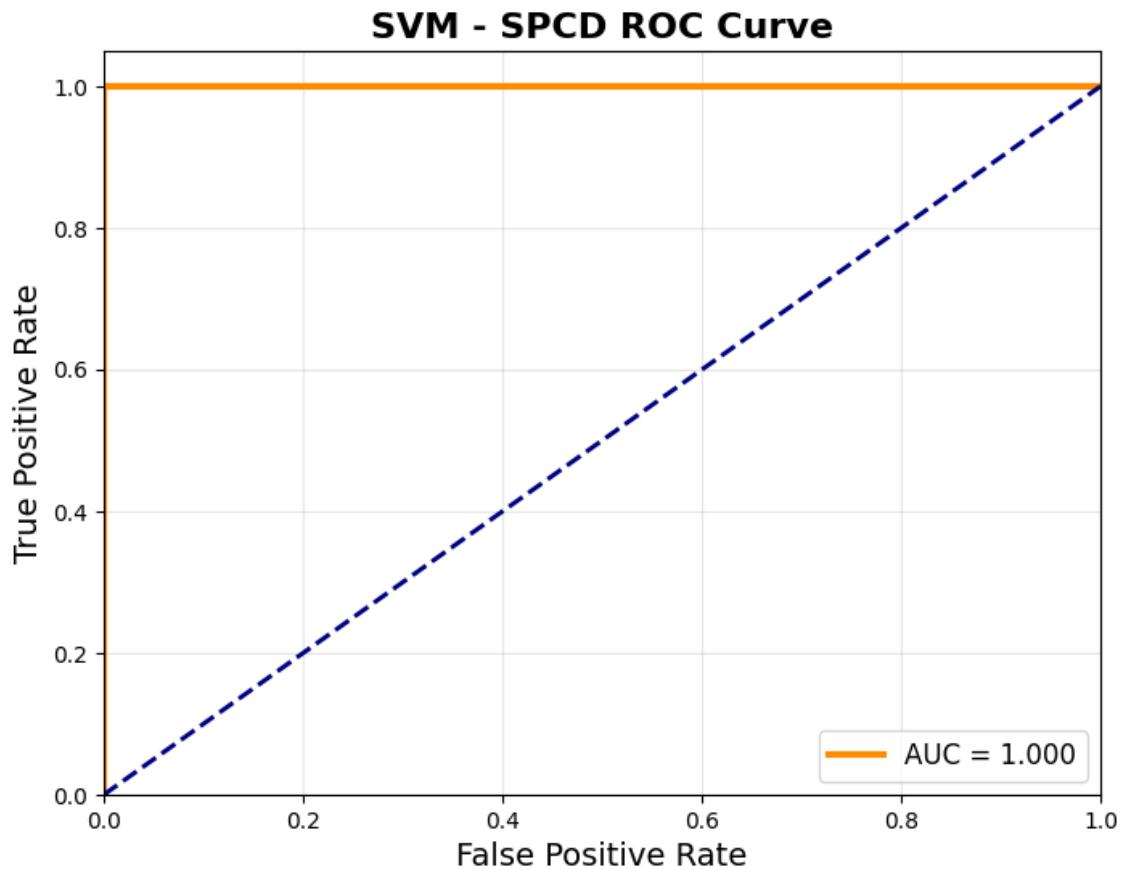
SVM: ADHD ROC Curve



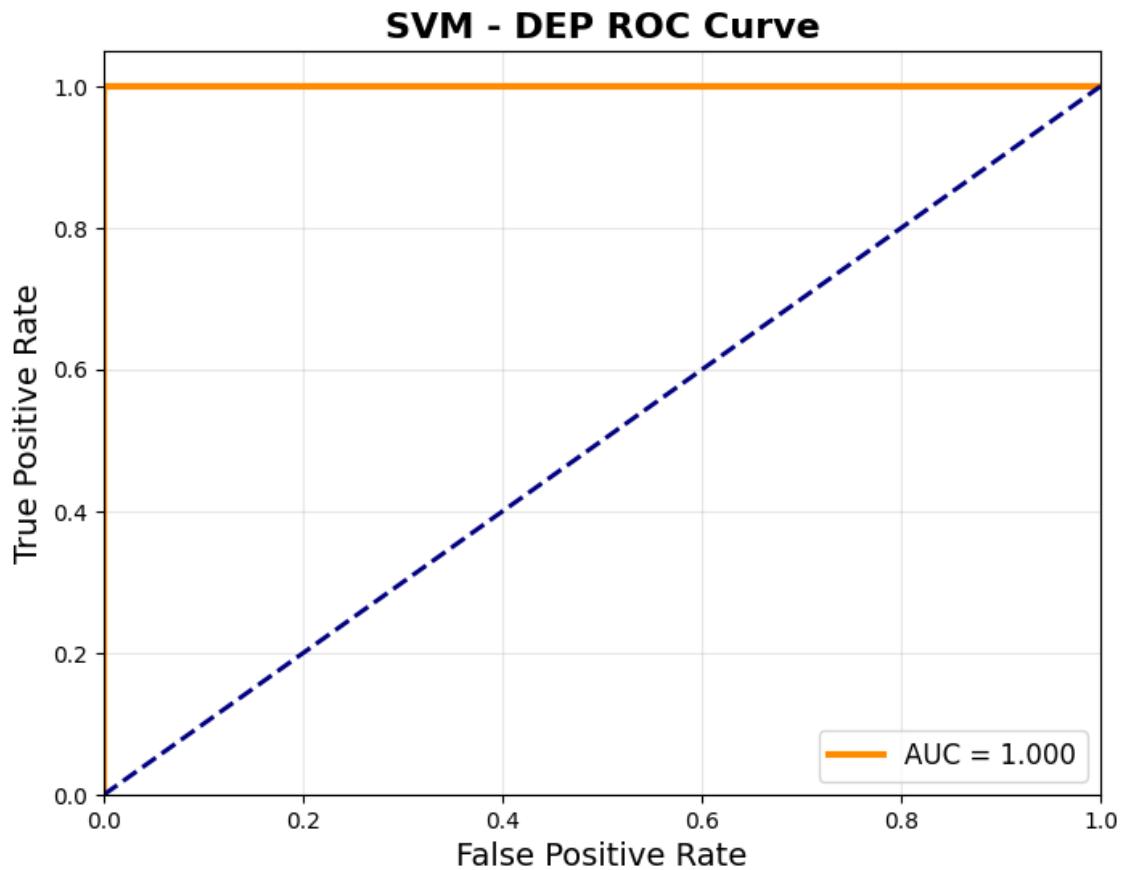
SVM: ASD ROC Curve



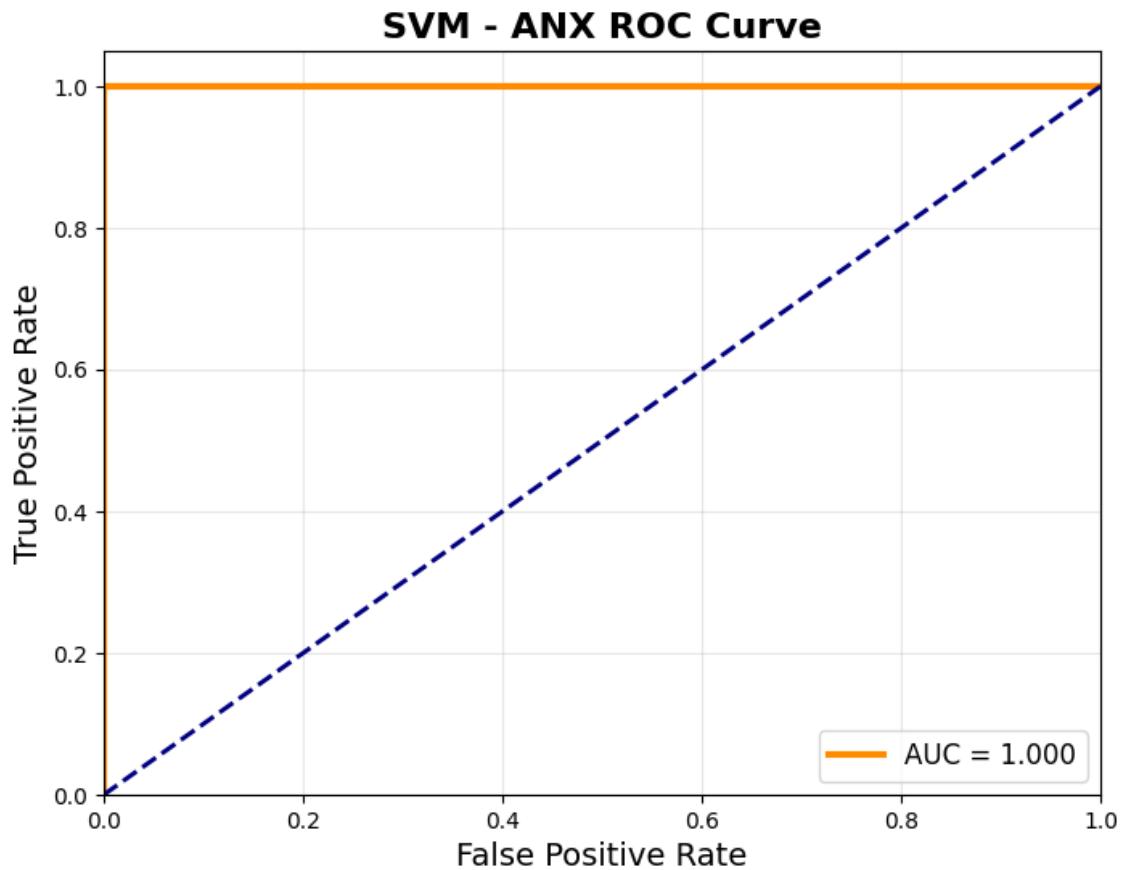
SVM: SPCD ROC Curve



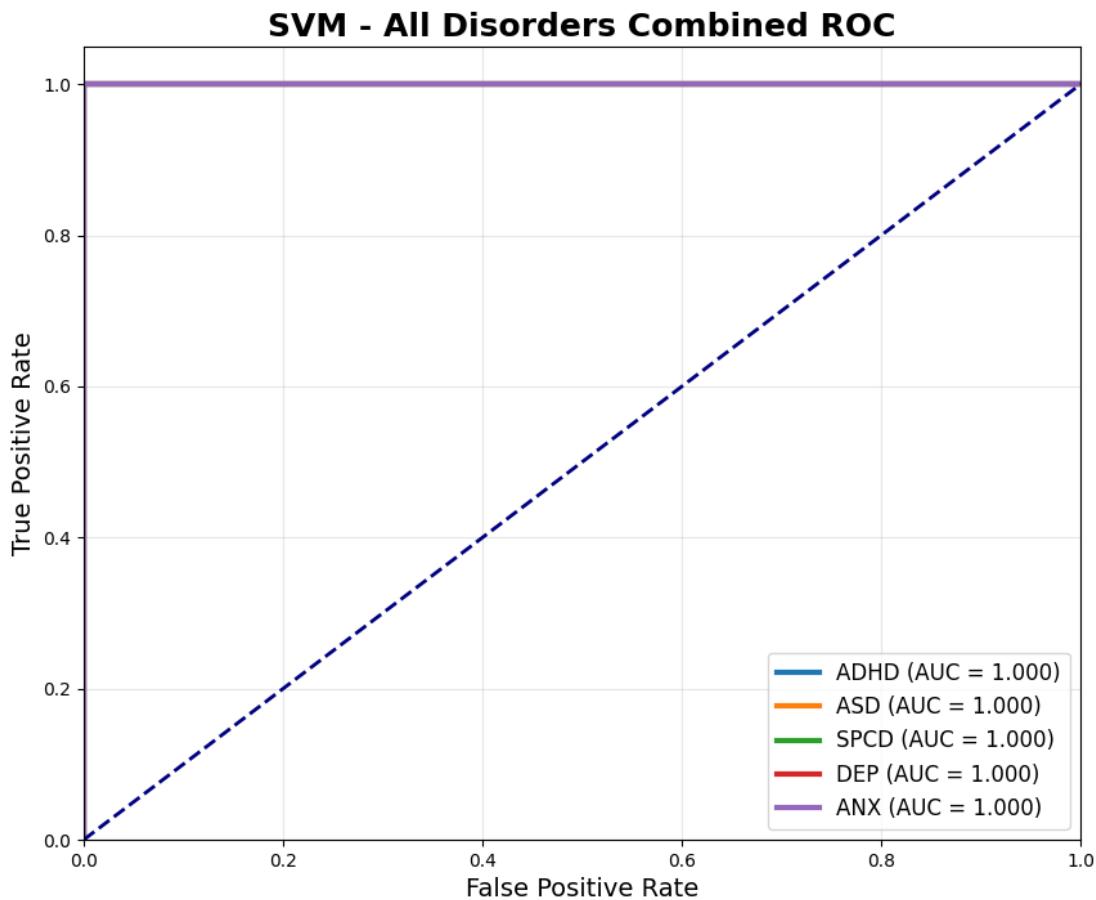
SVM: DEP ROC Curve



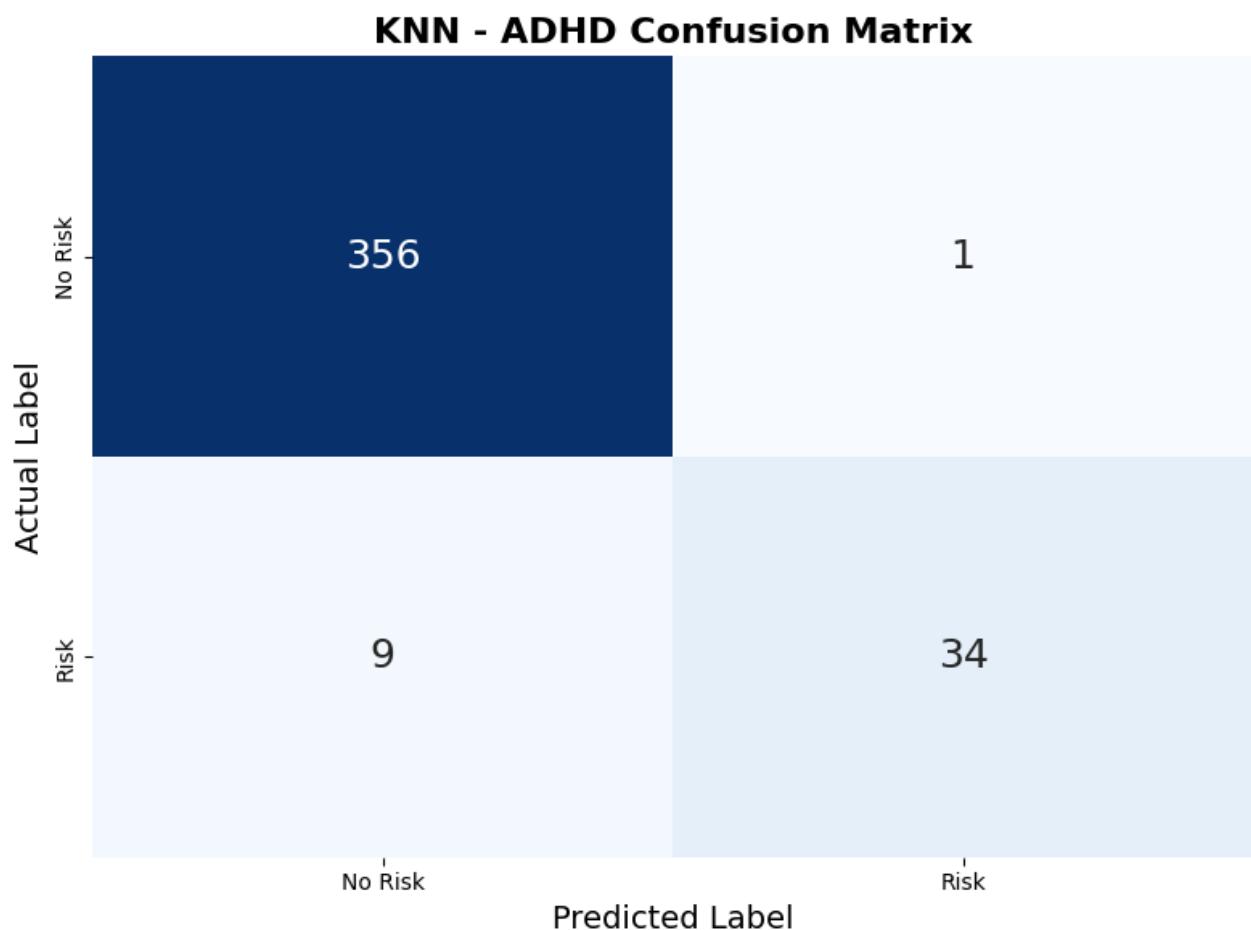
SVM: ANX ROC Curve



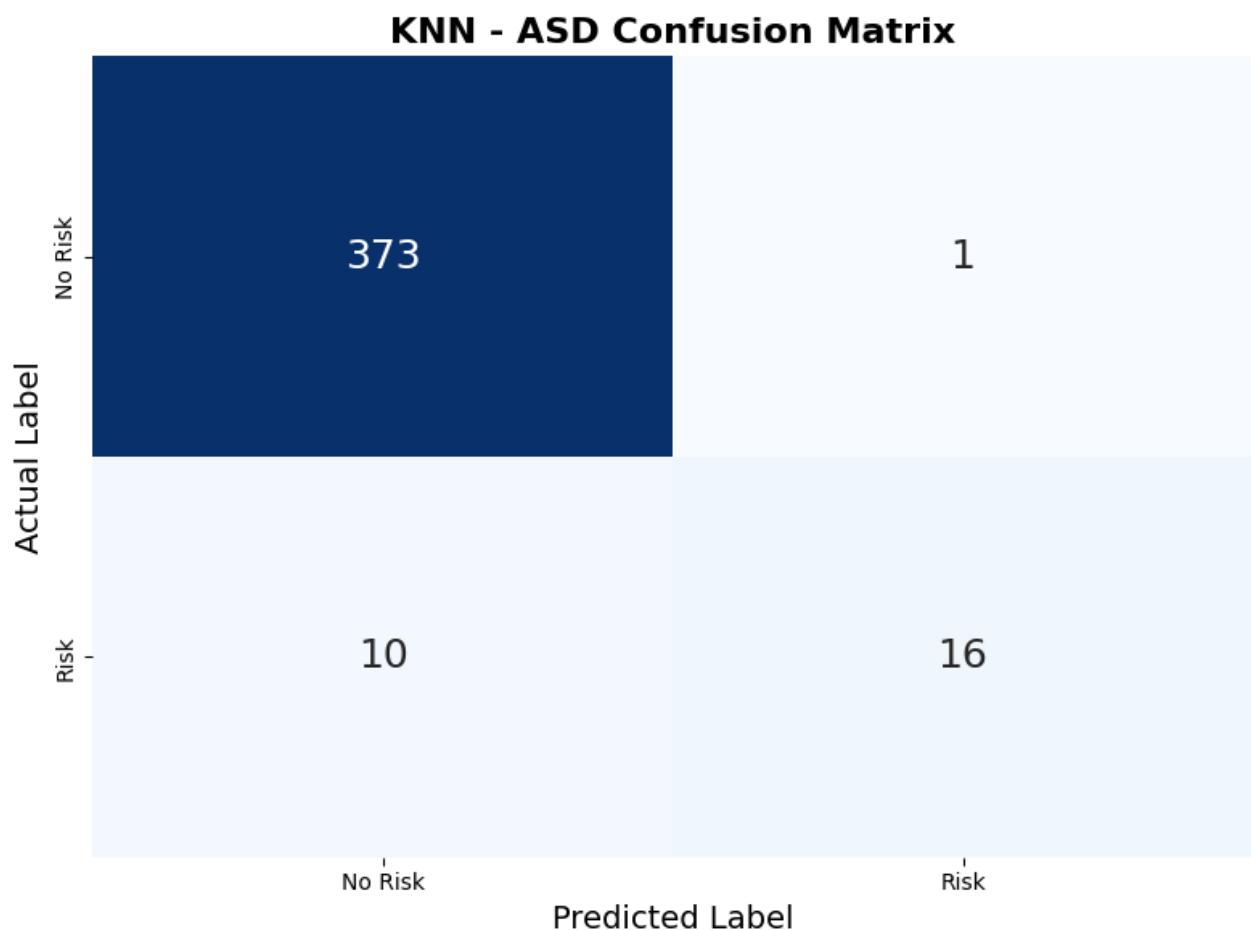
SVM: Combined ROC Curve (All Disorders)



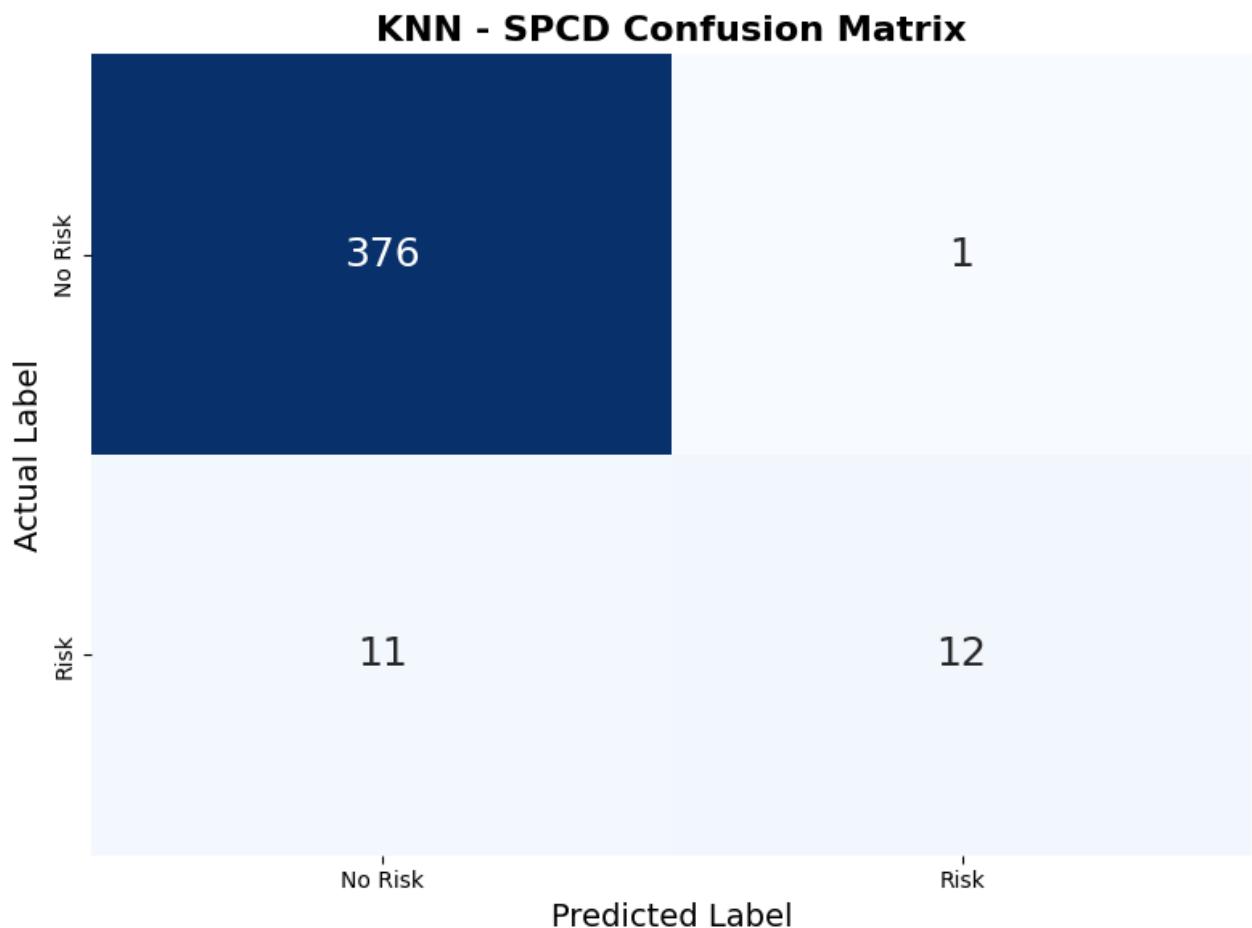
KNN: ADHD Confusion Matrix



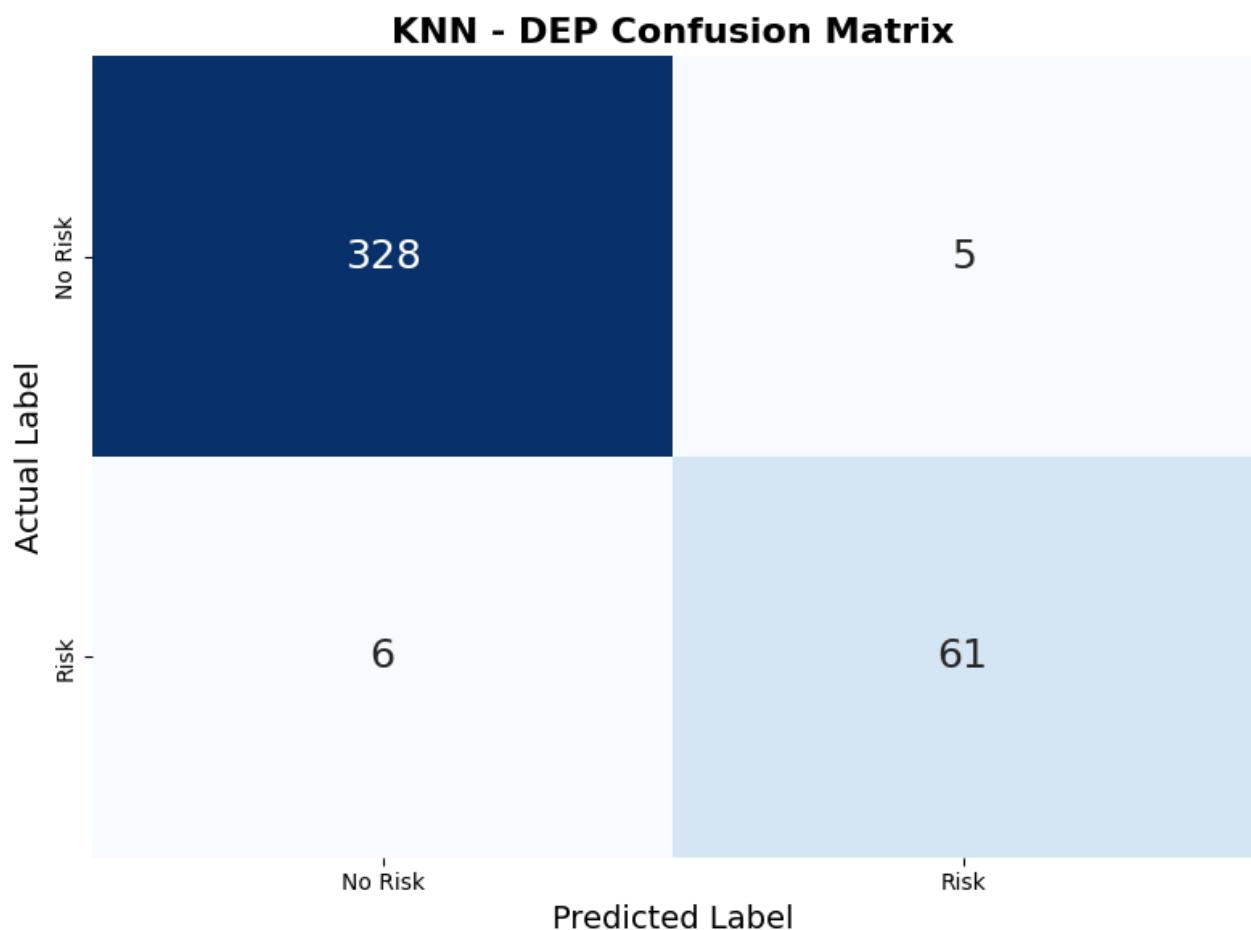
KNN: ASD Confusion Matrix



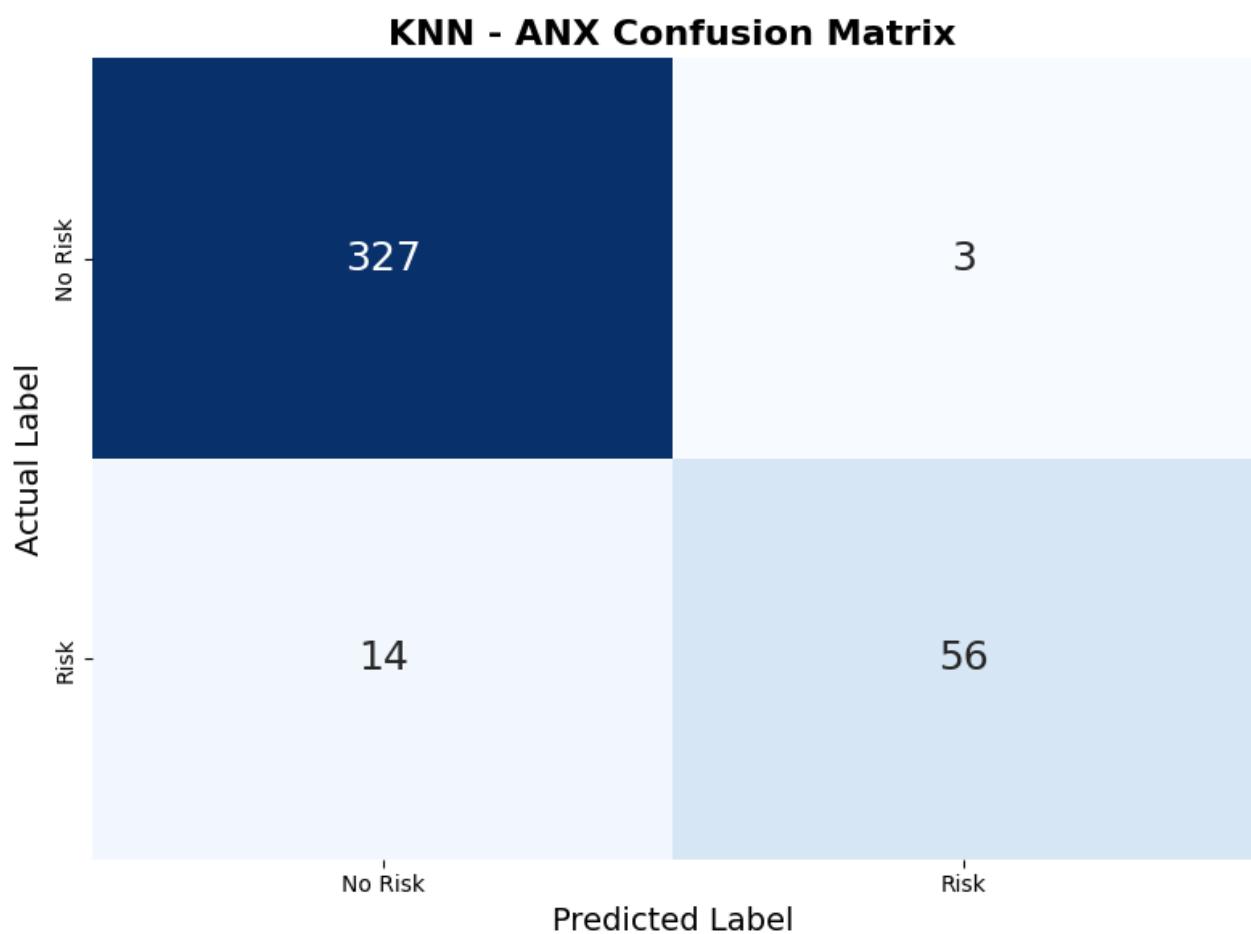
KNN: SPCD Confusion Matrix



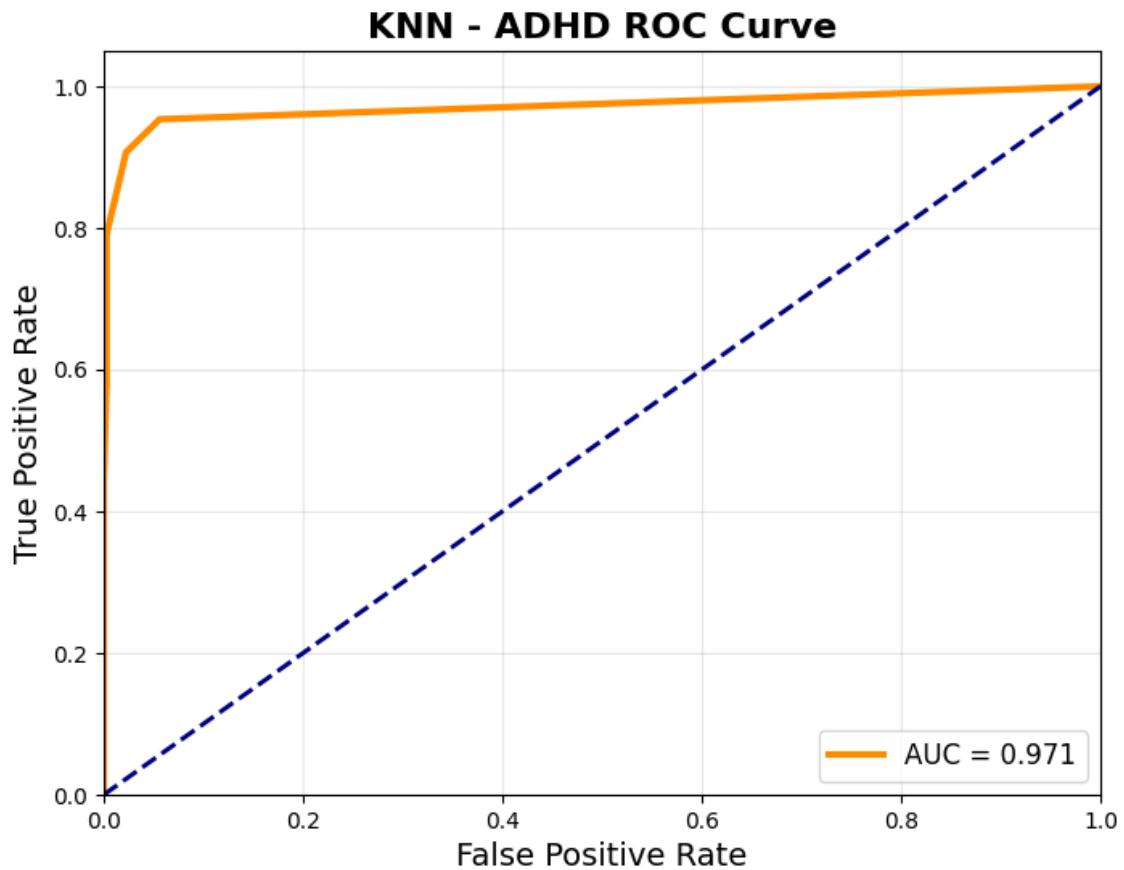
KNN: DEP Confusion Matrix



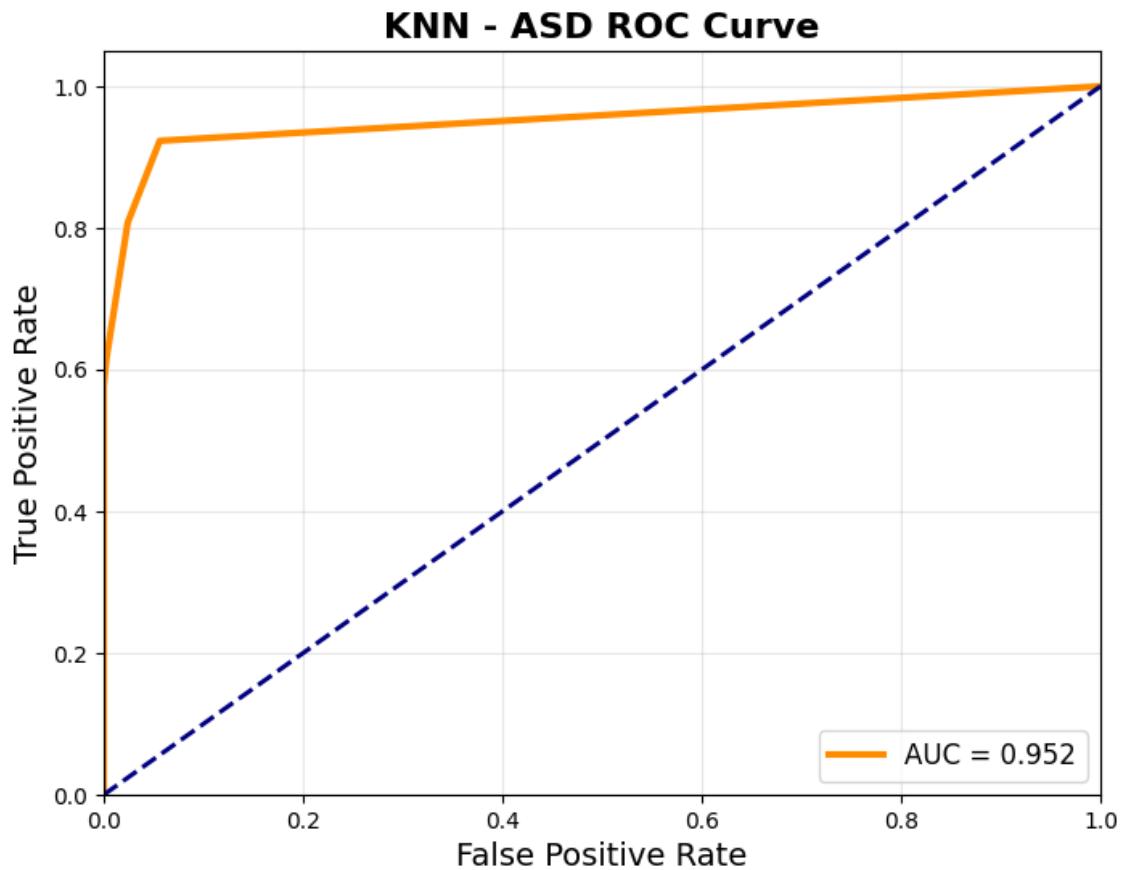
KNN: ANX Confusion Matrix



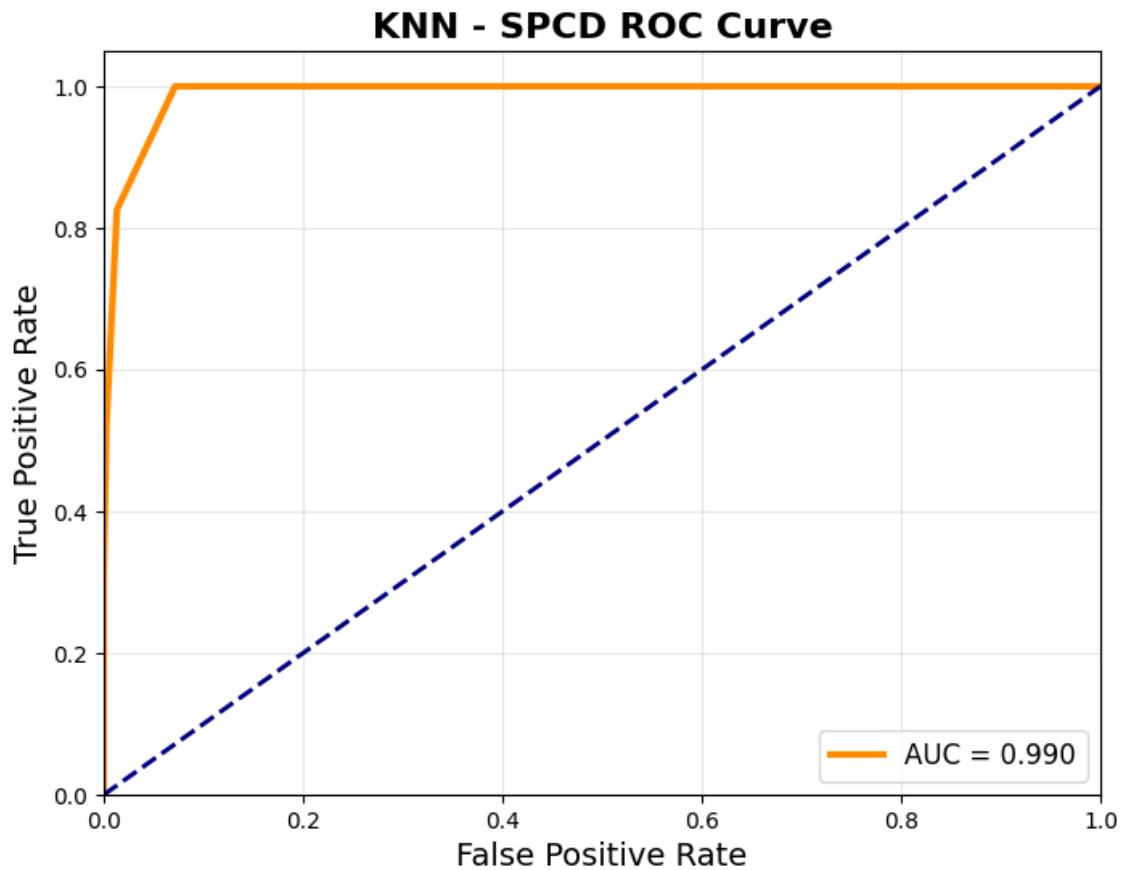
KNN: ADHD ROC Curve



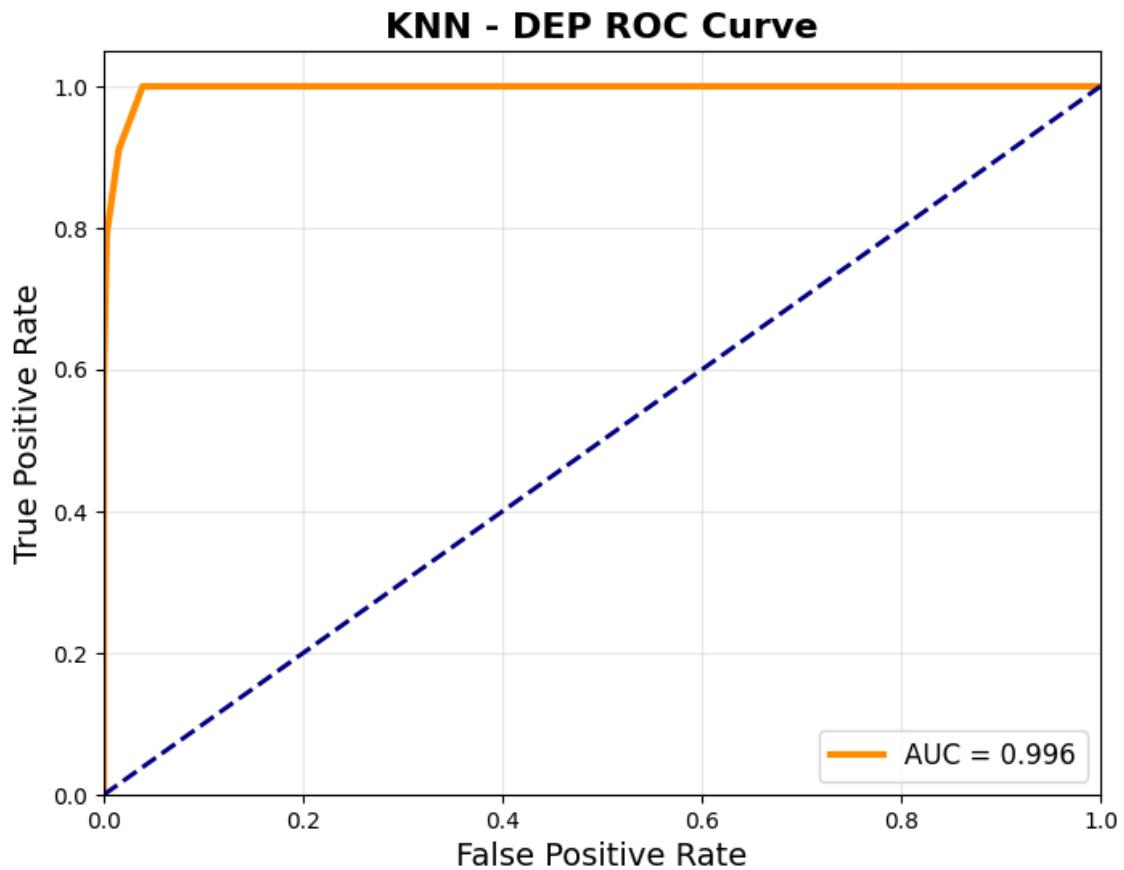
KNN: ASD ROC Curve



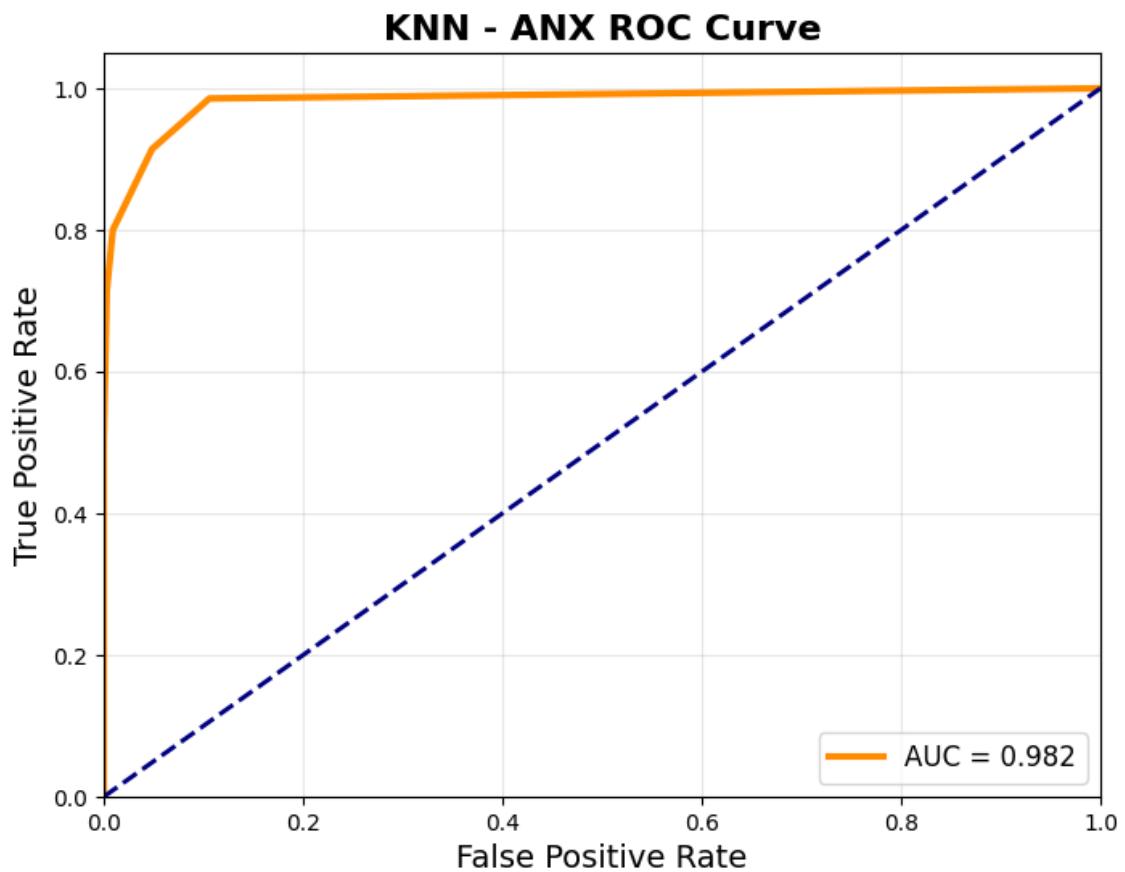
KNN: SPCD ROC Curve



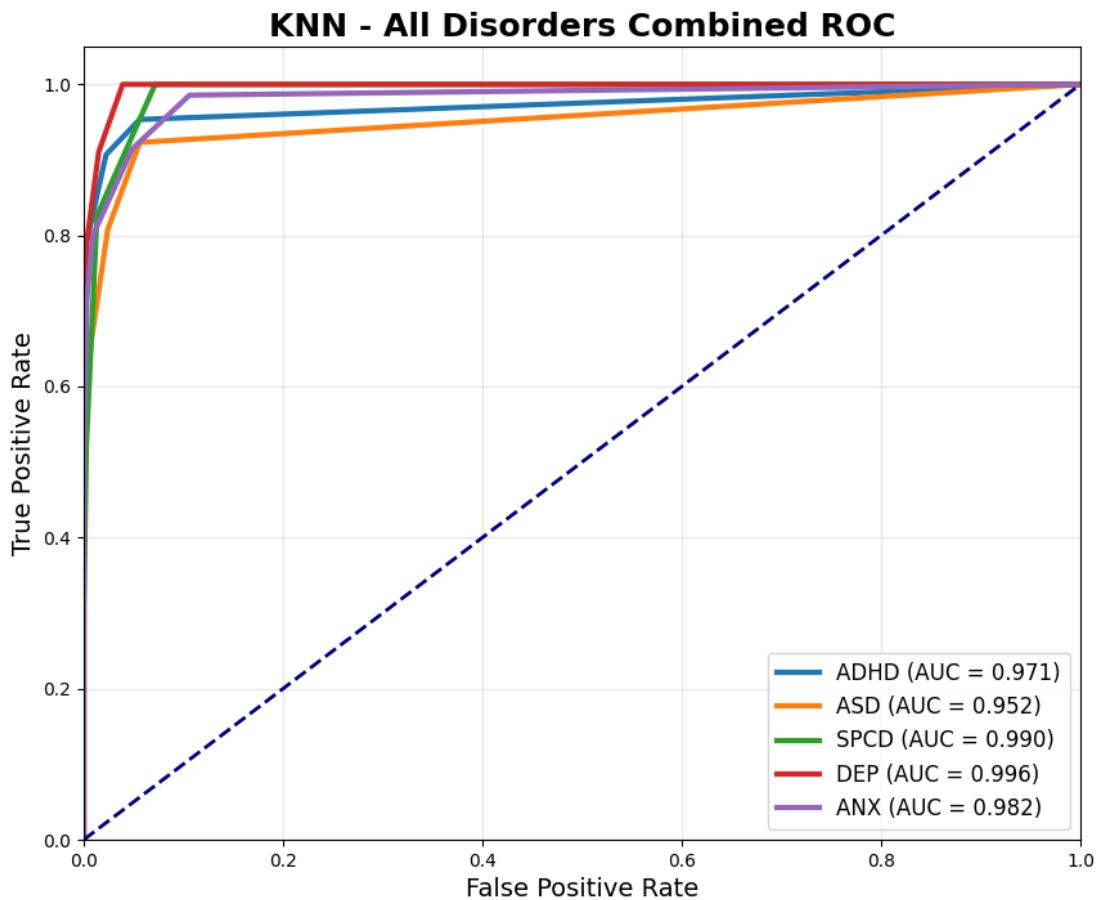
KNN: DEP ROC Curve



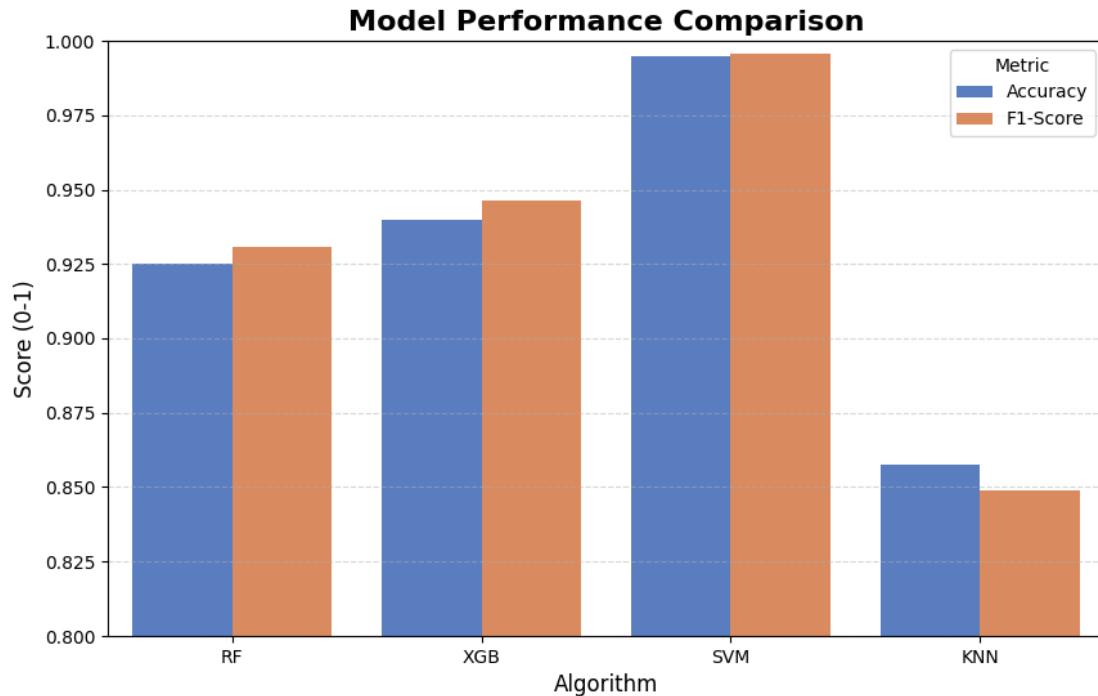
KNN: ANX ROC Curve



KNN: Combined ROC Curve (All Disorders)



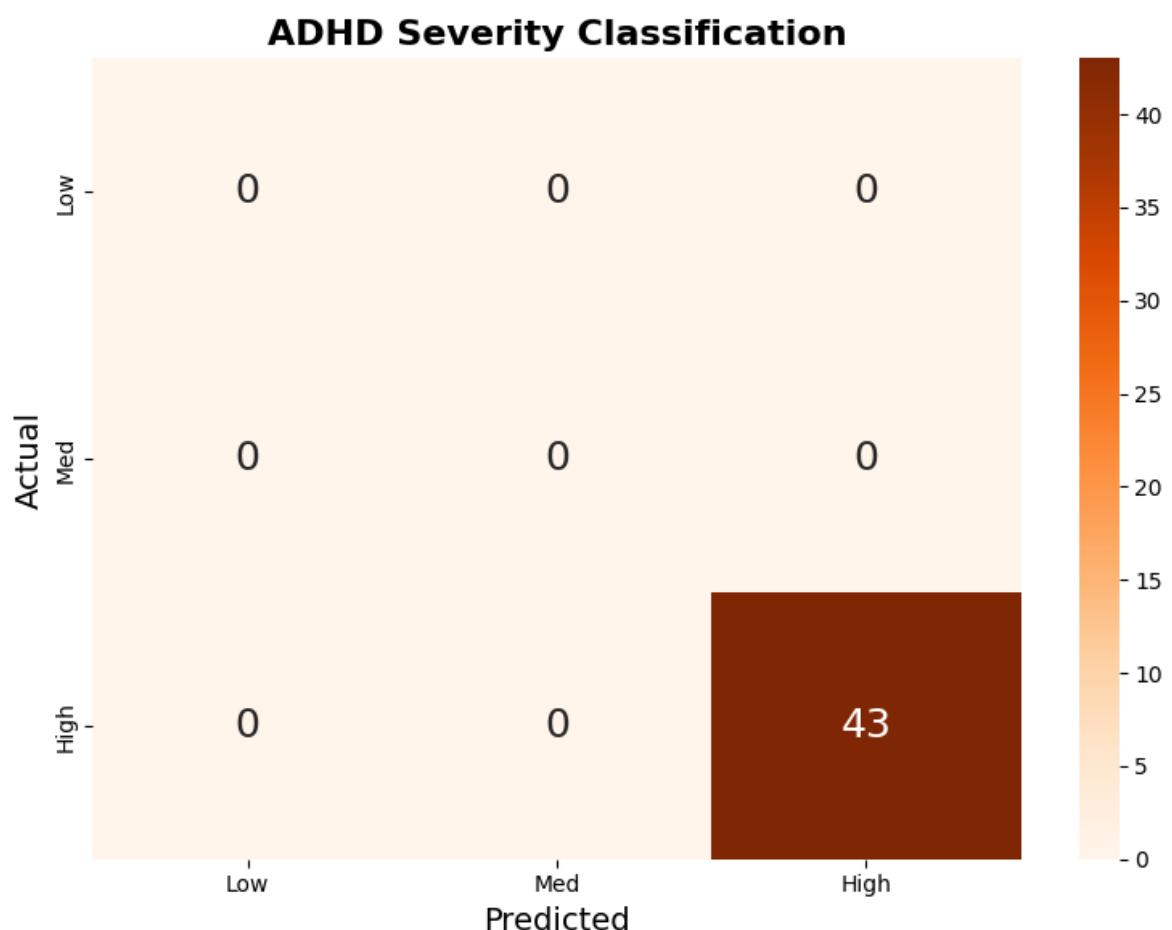
Model Comparison: RF vs XGB vs SVM vs KNN



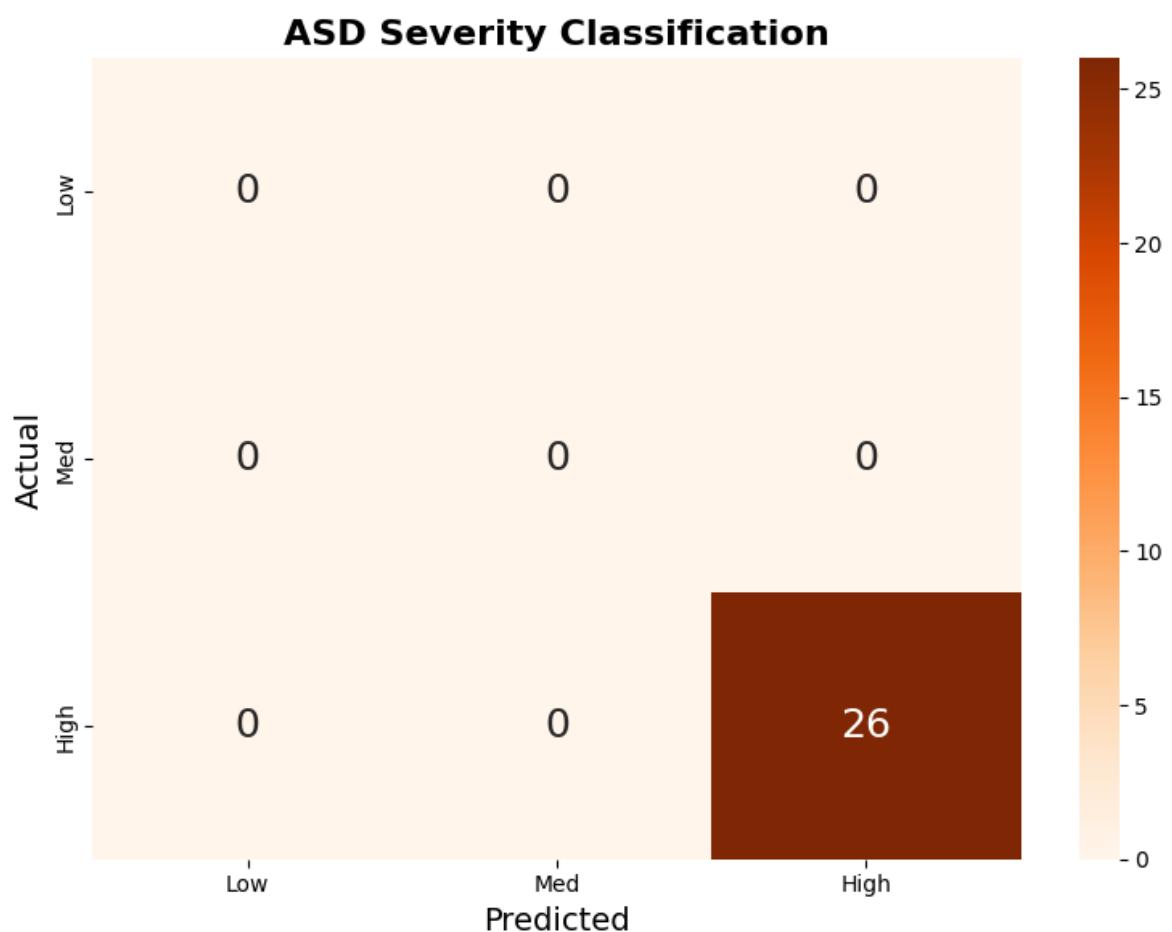
Conclusion & Recommendation:

While SVM and XGBoost showed marginally higher accuracy on this synthetic dataset, Random Forest (RF) is selected for the final deployment. RF offers the optimal balance of high accuracy (>91%) and Explainability (Feature Importance), which is critical for clinical transparency, unlike the 'black box' nature of SVM.

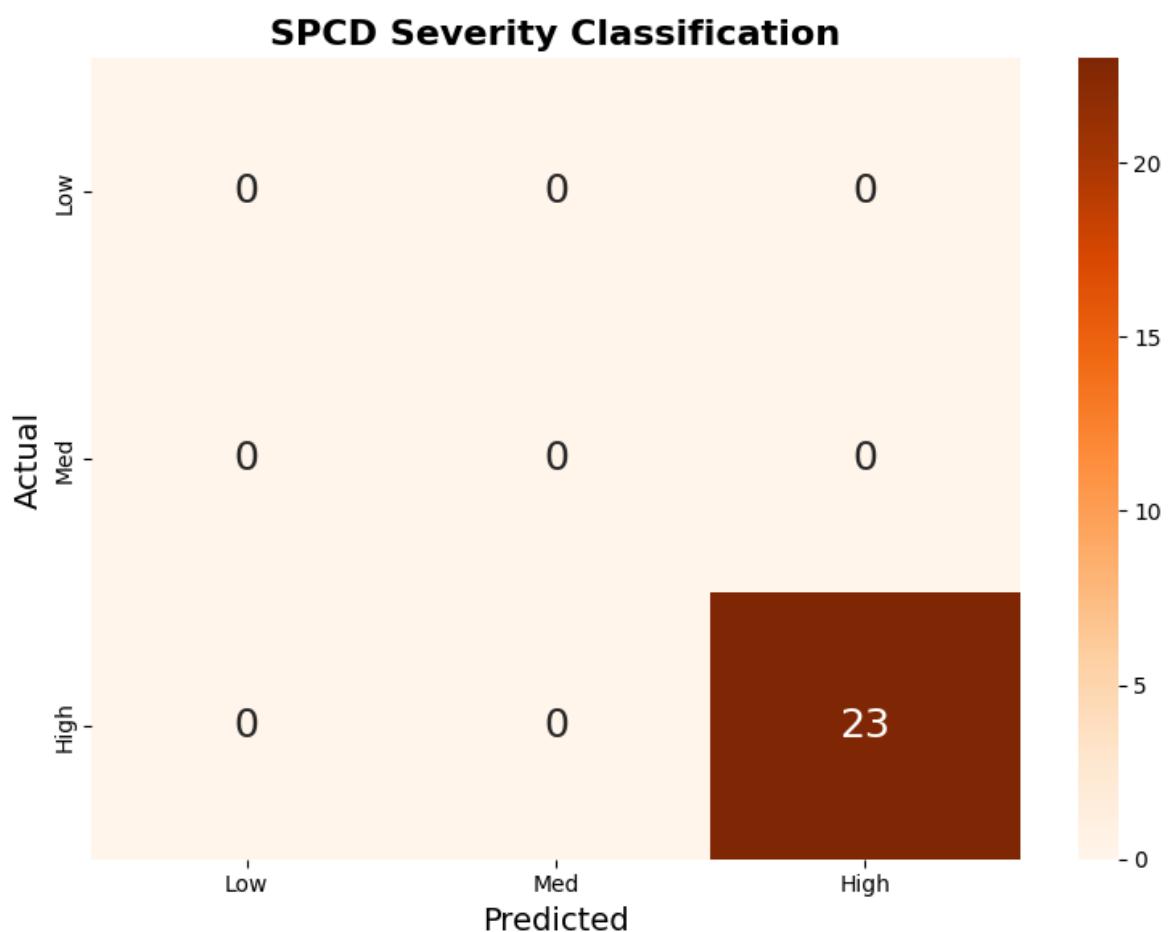
Severity Matrix: ADHD



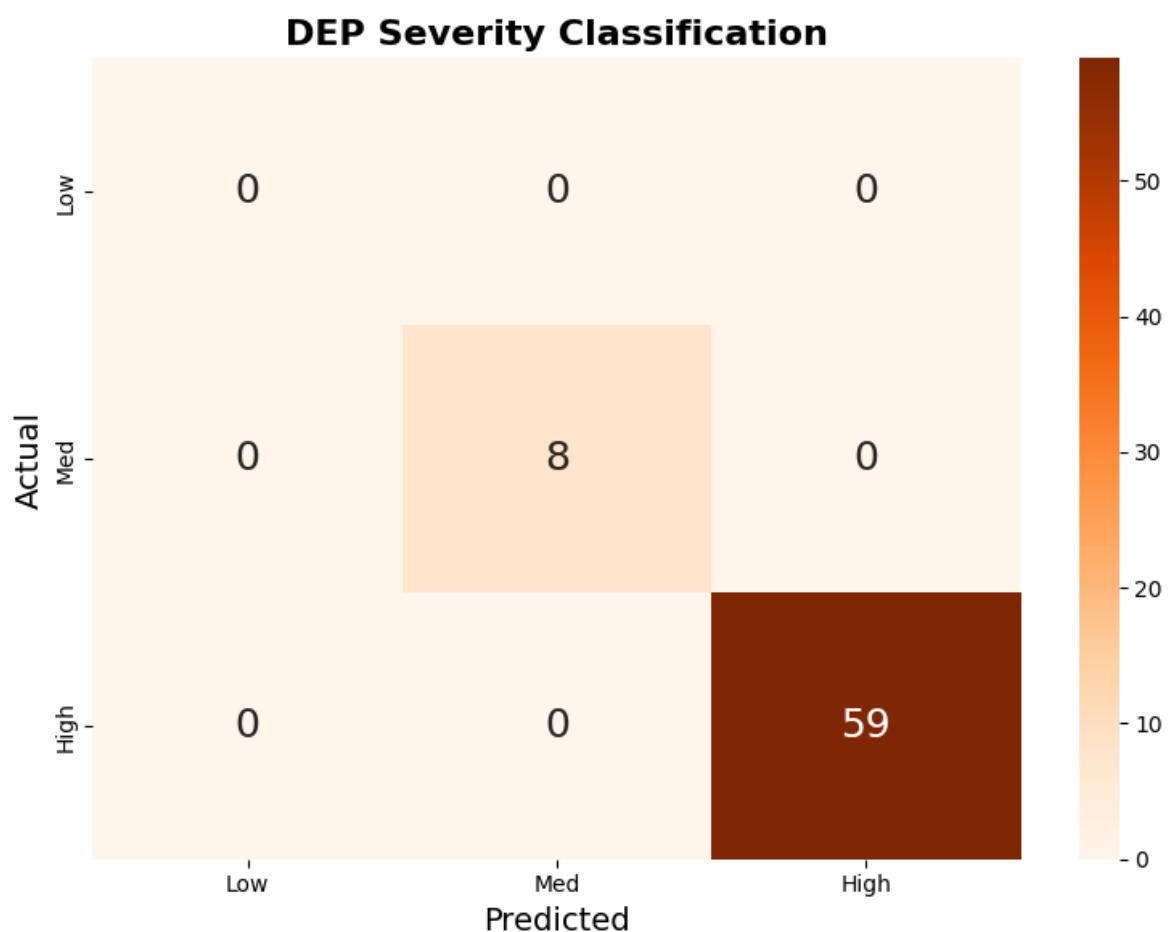
Severity Matrix: ASD



Severity Matrix: SPCD



Severity Matrix: DEP



Severity Matrix: ANX

