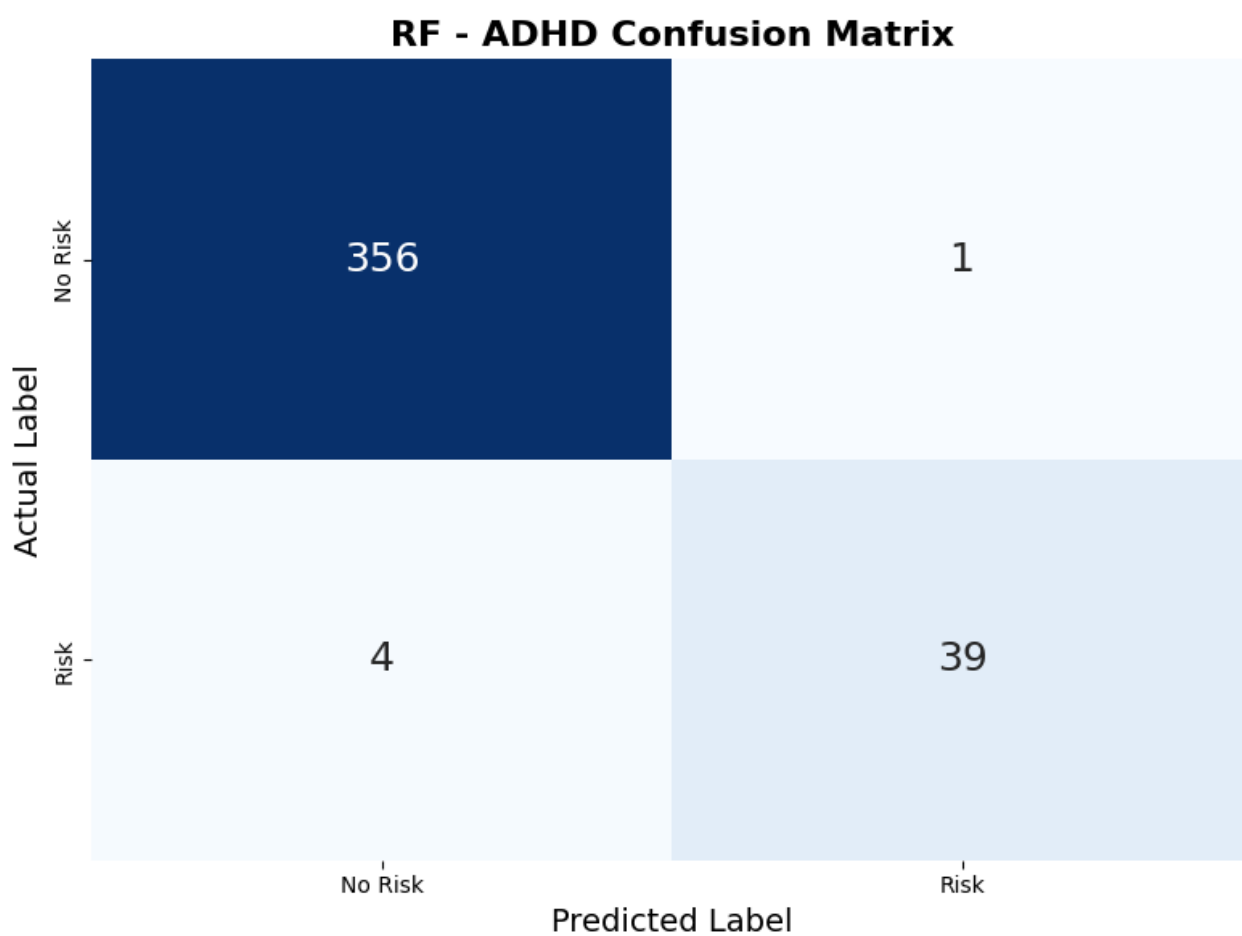


# Model Performance Analysis

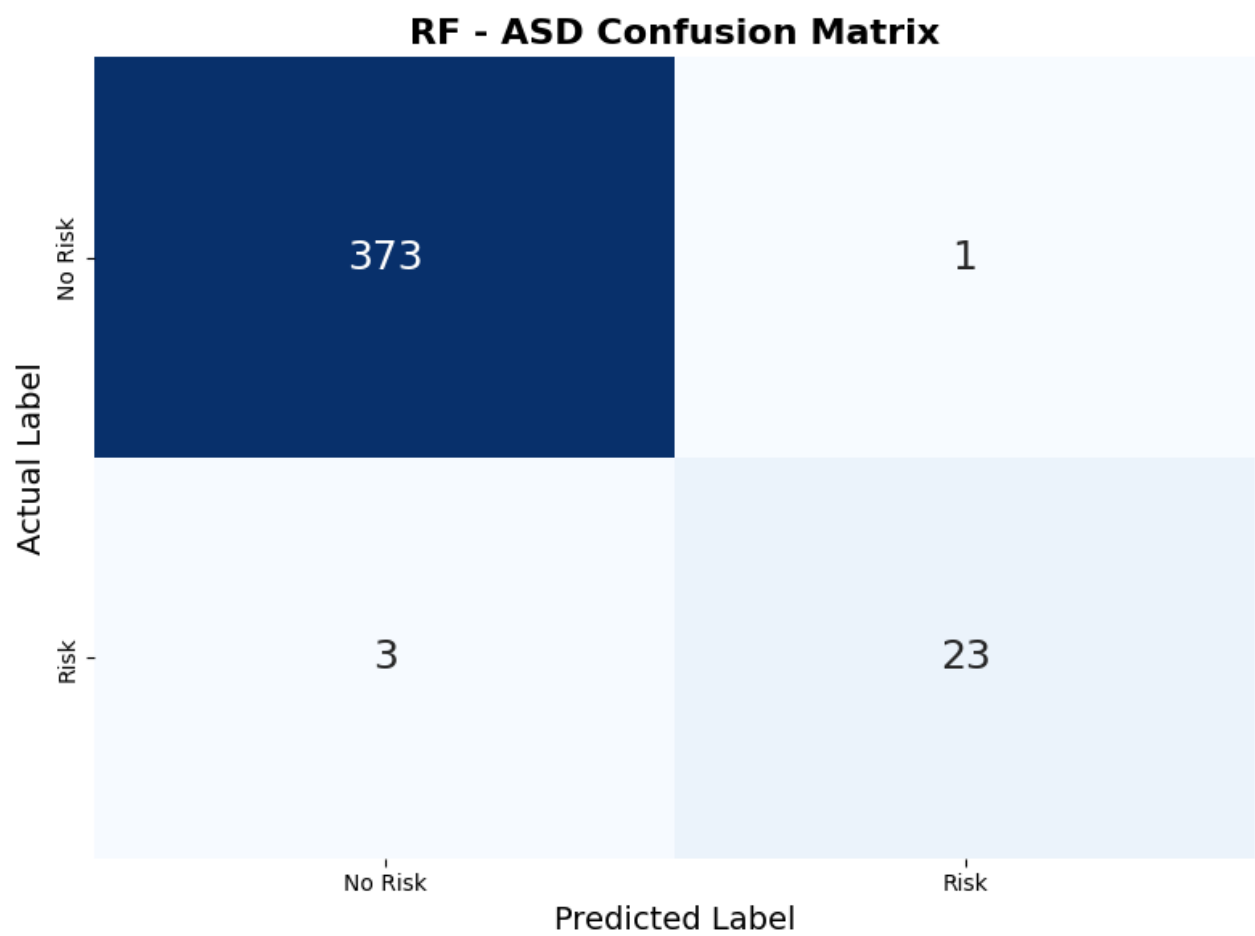
## Final Project Report

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

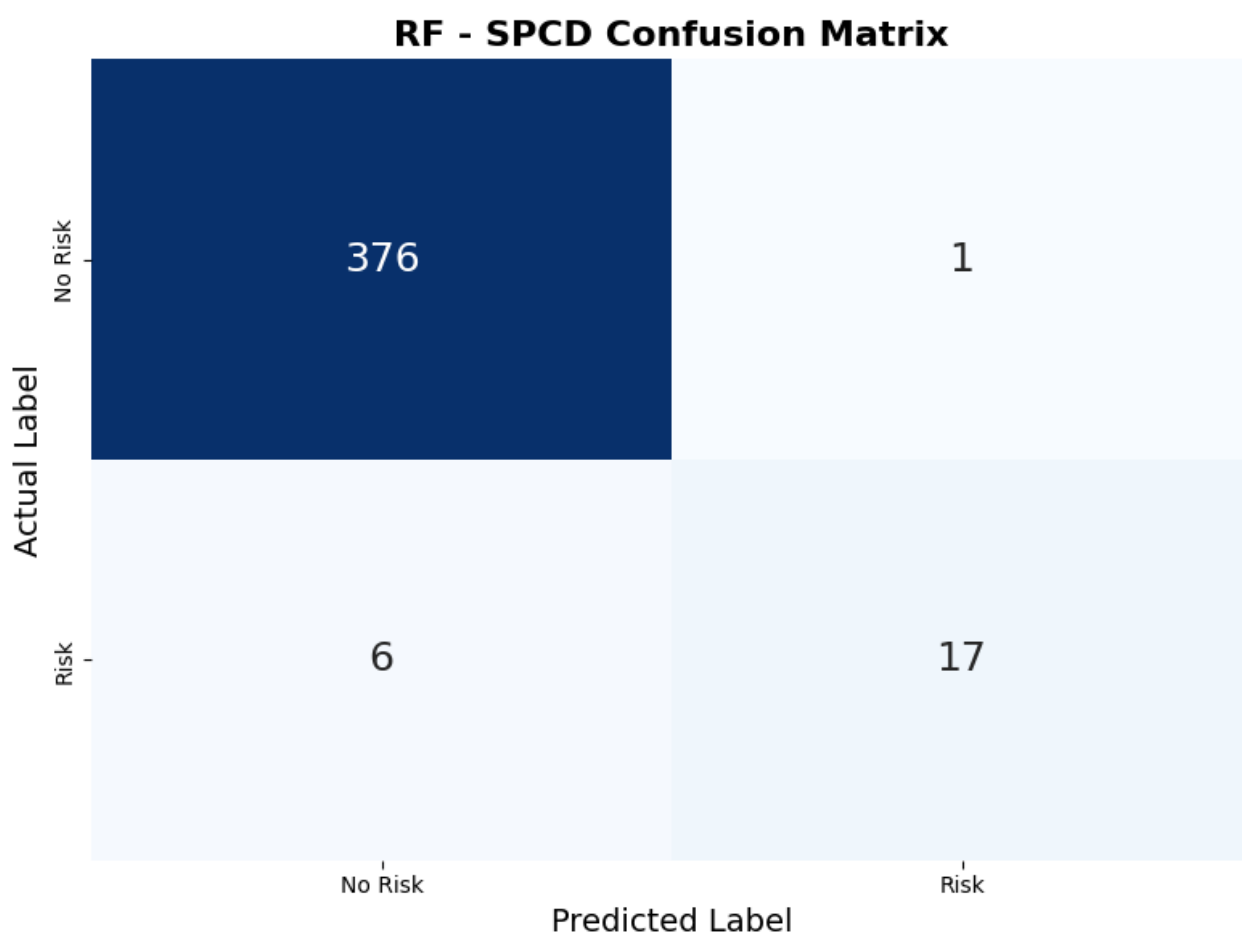
# RF: ADHD Confusion Matrix



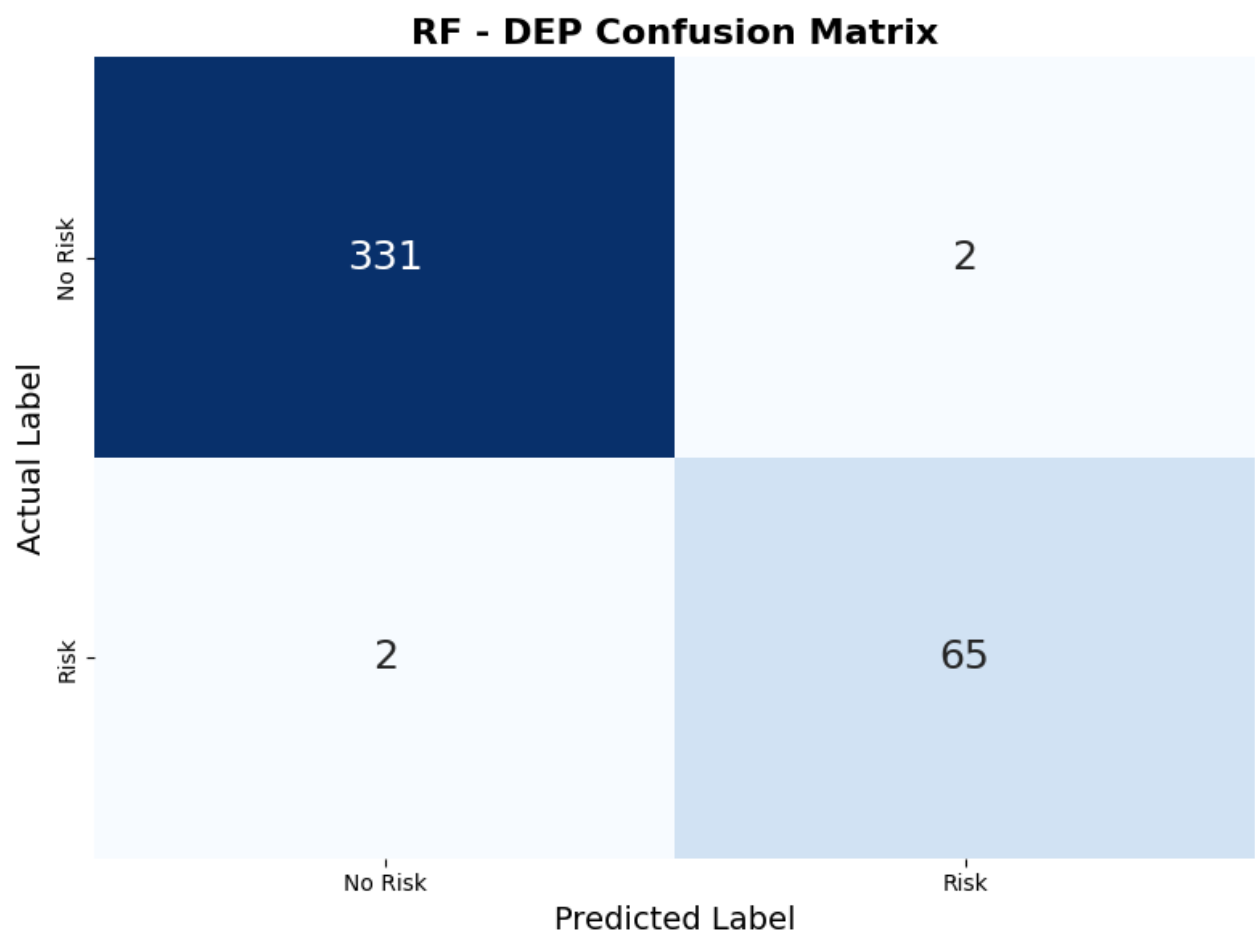
# RF: ASD Confusion Matrix



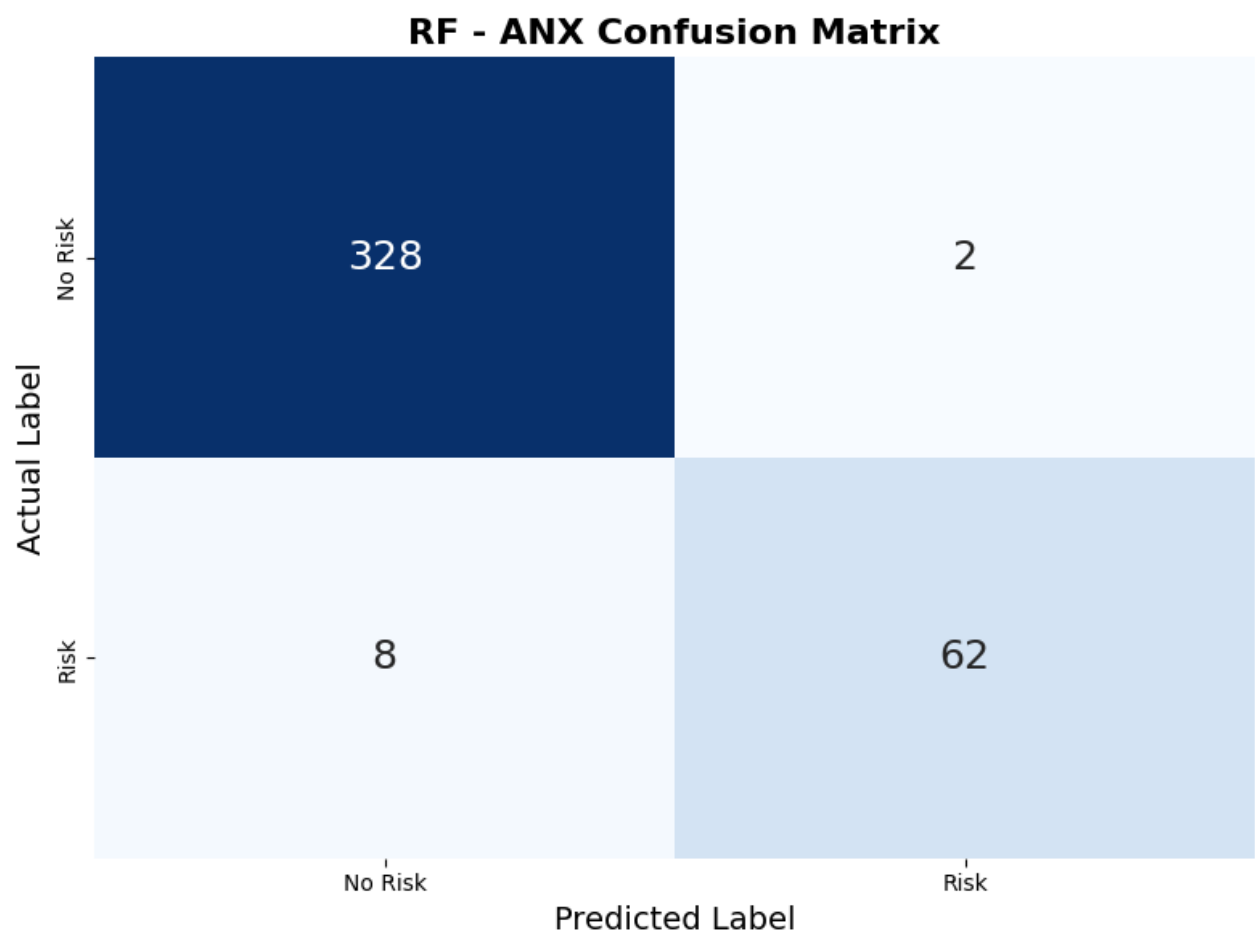
## RF: SPCD Confusion Matrix



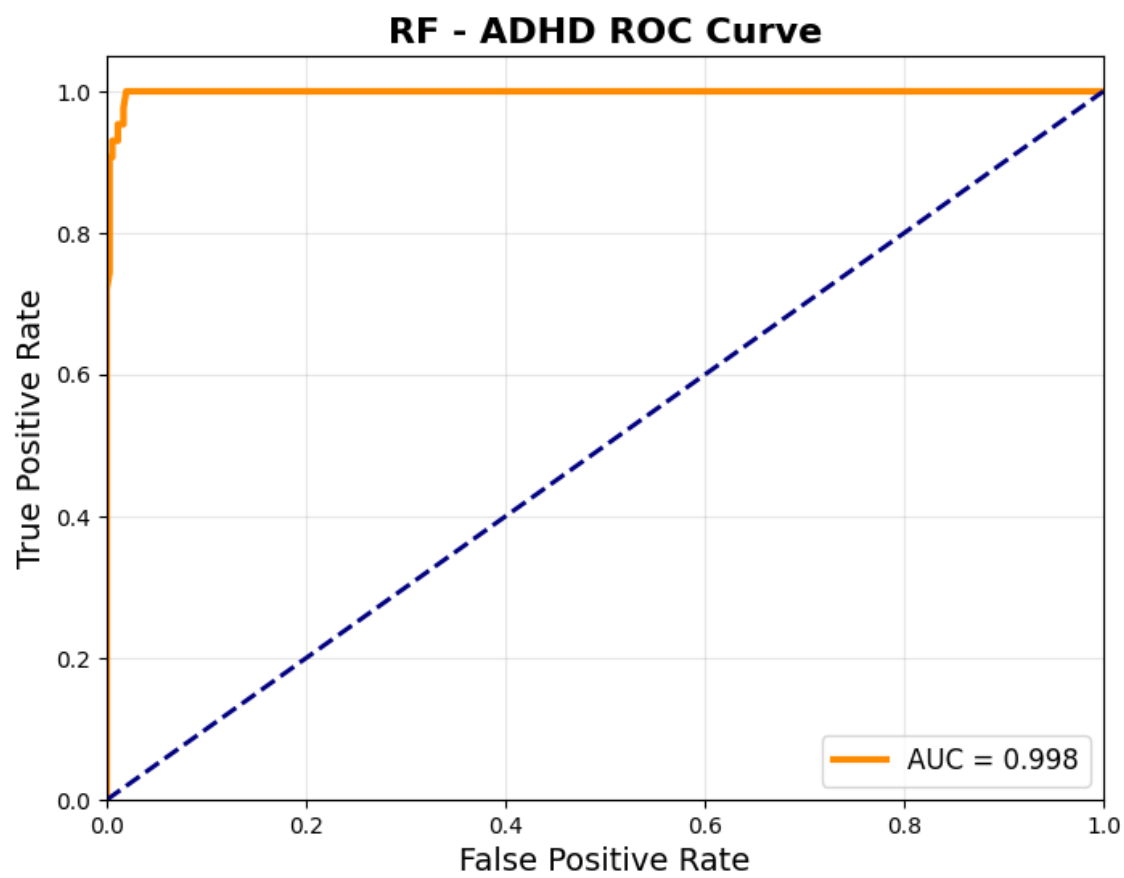
# RF: DEP Confusion Matrix



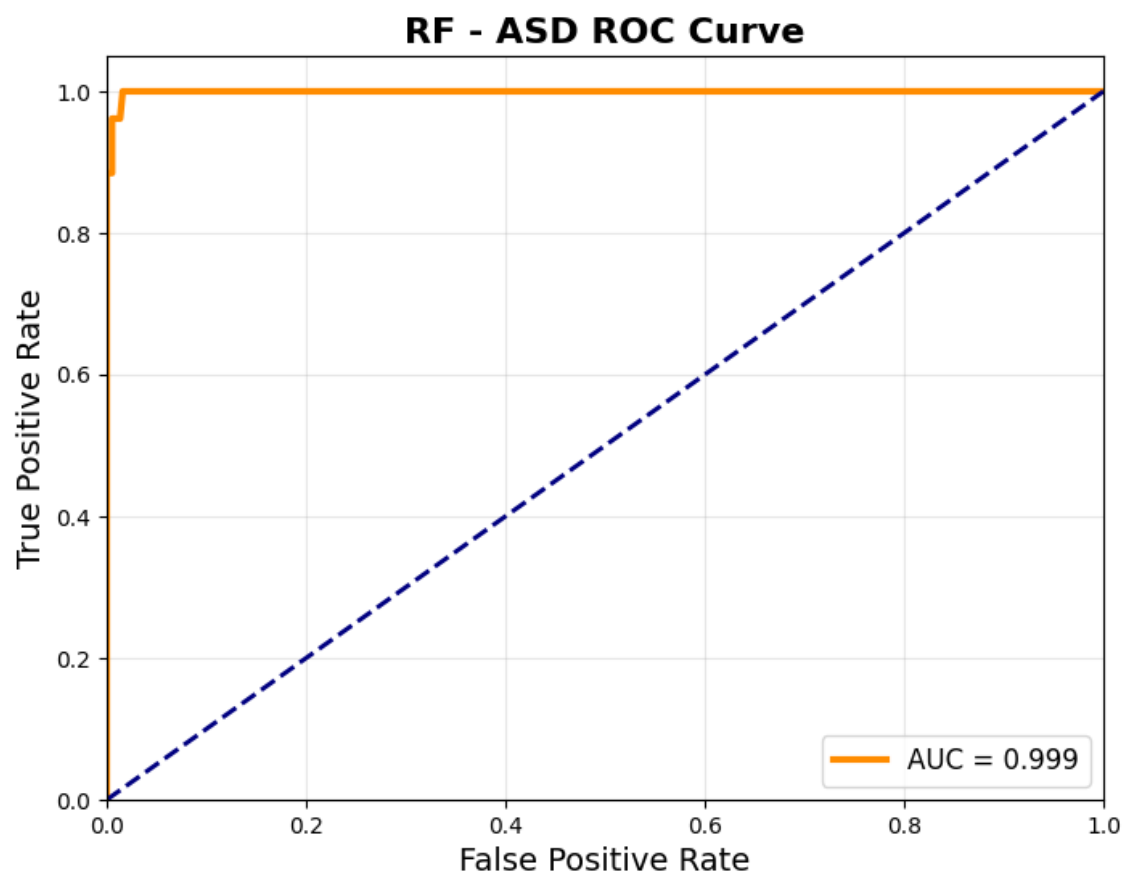
# RF: ANX Confusion Matrix



# RF: ADHD ROC Curve

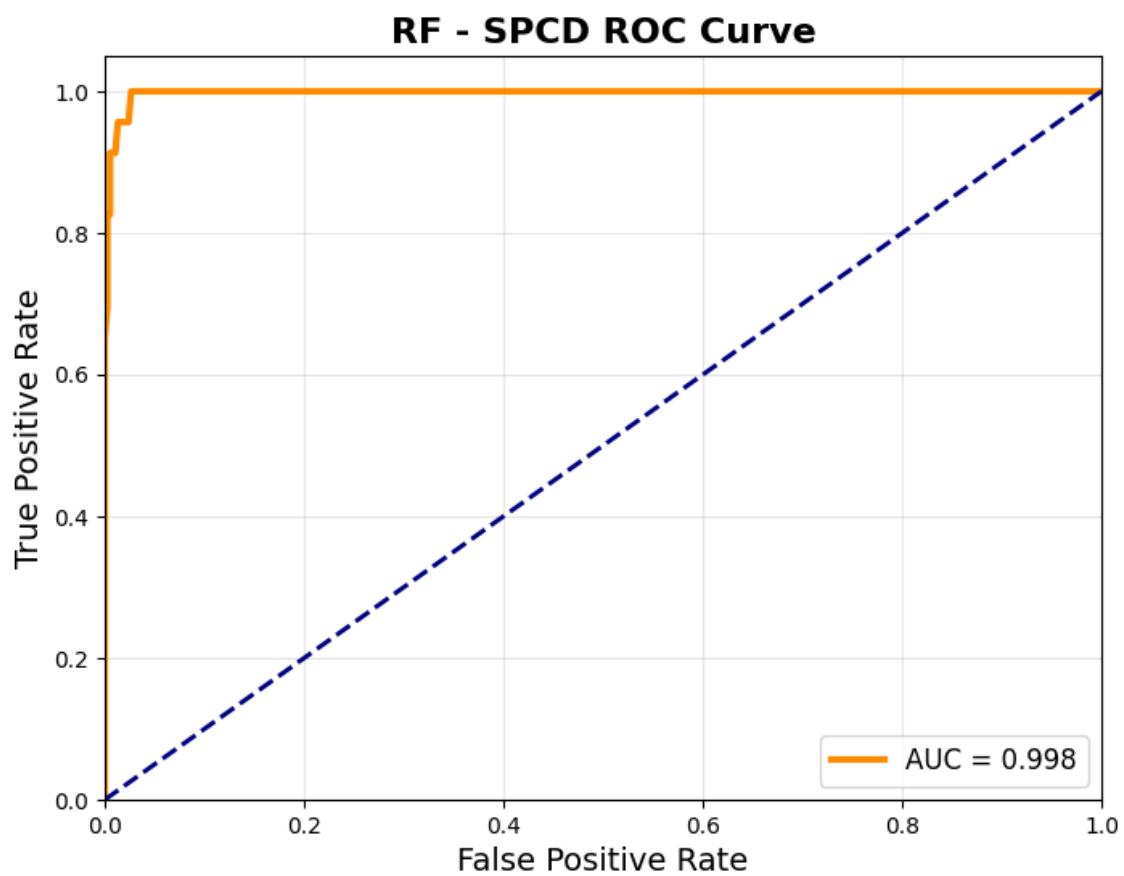


# RF: ASD ROC Curve

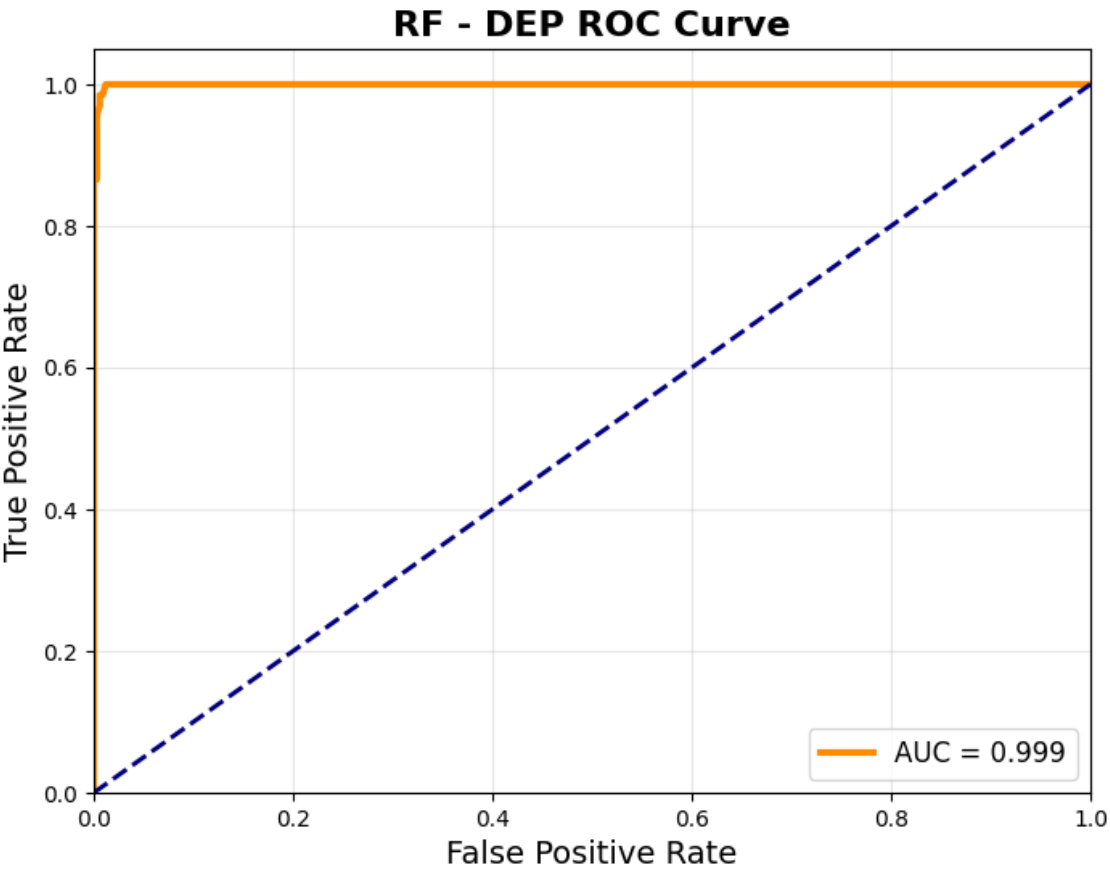




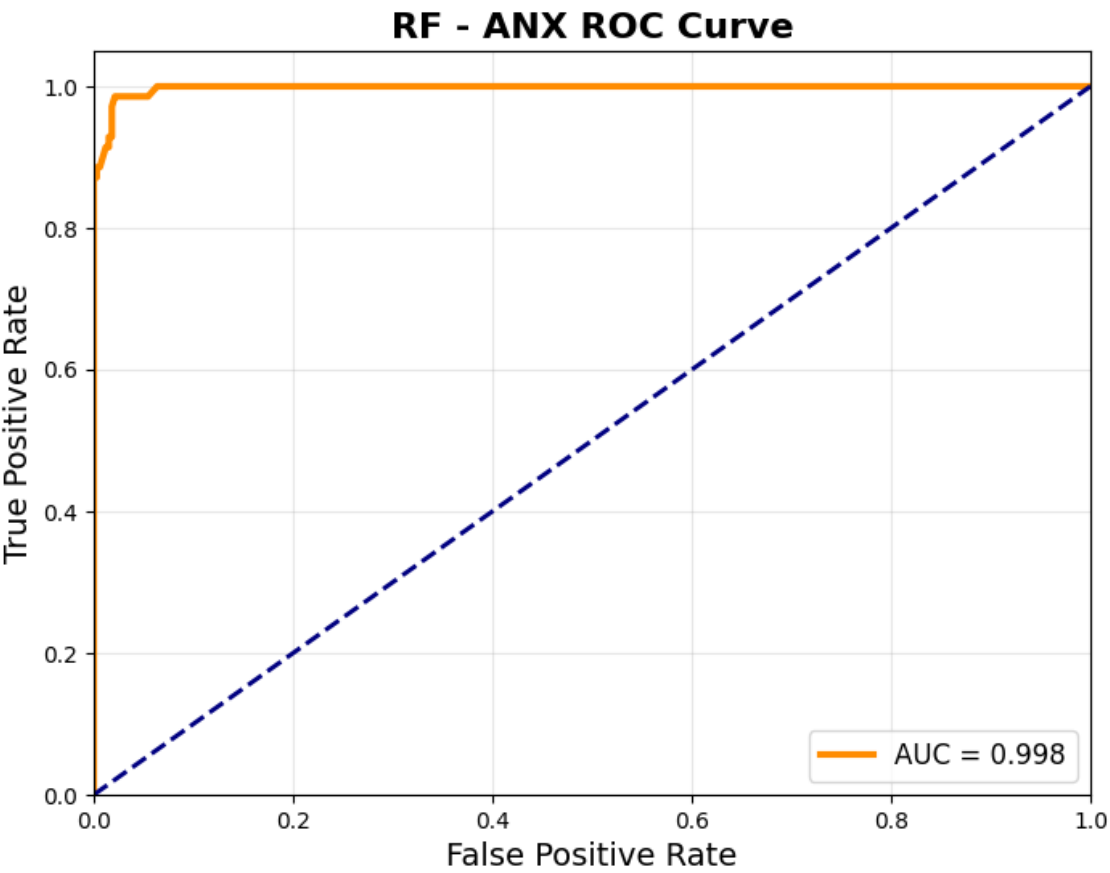
# RF: SPCD ROC Curve



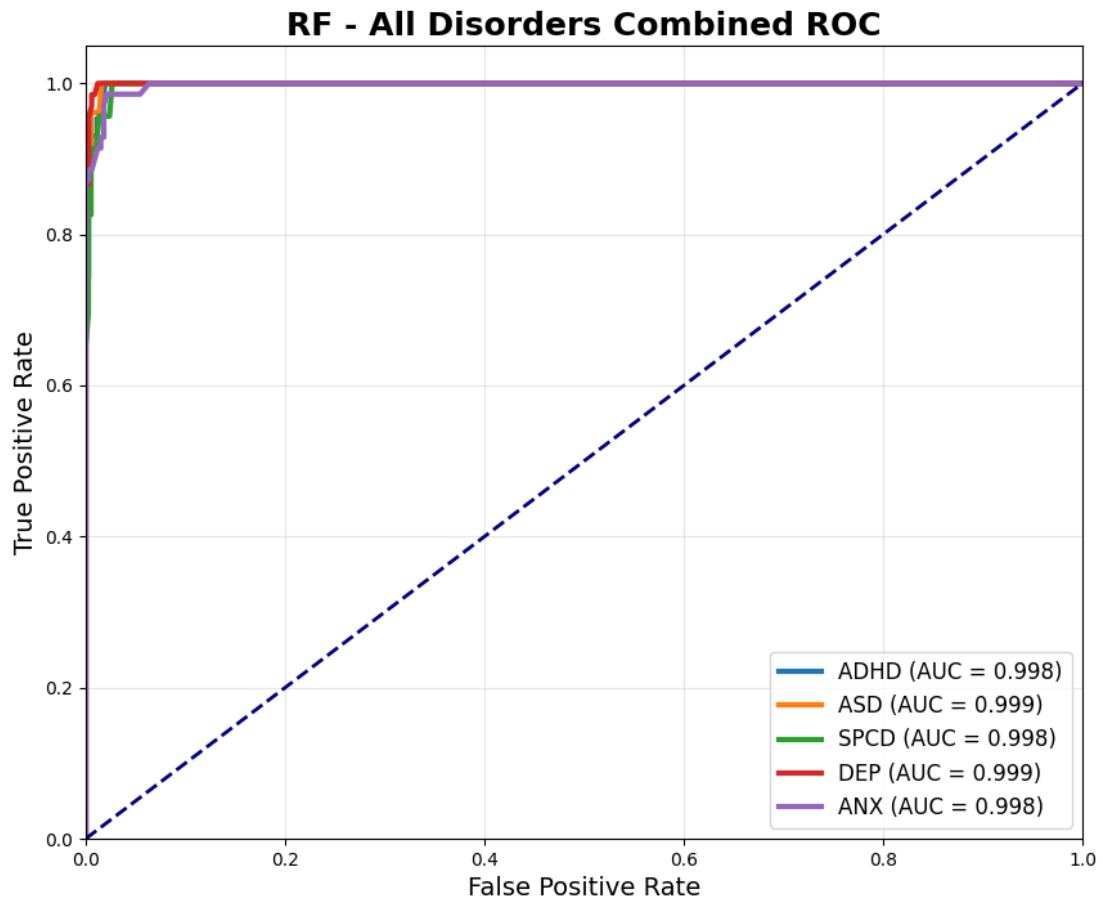
# RF: DEP ROC Curve



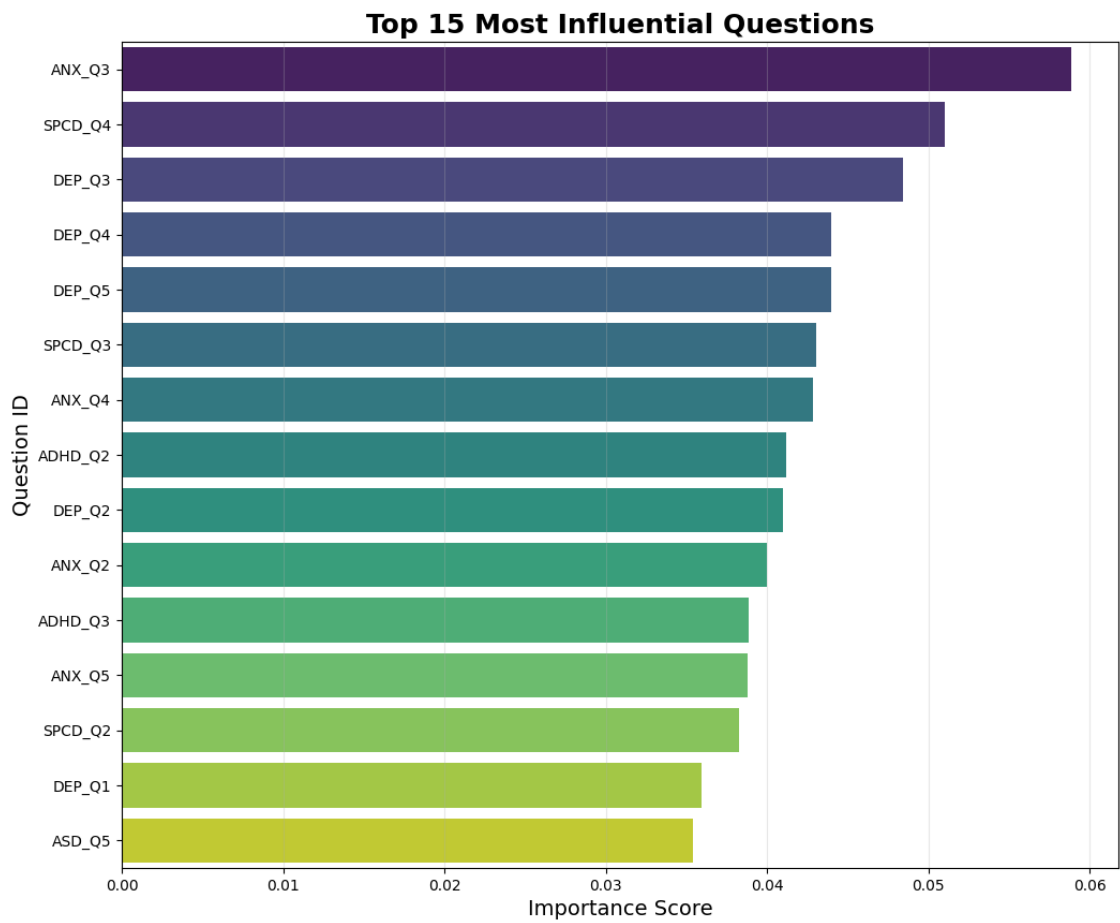
# RF: ANX ROC Curve



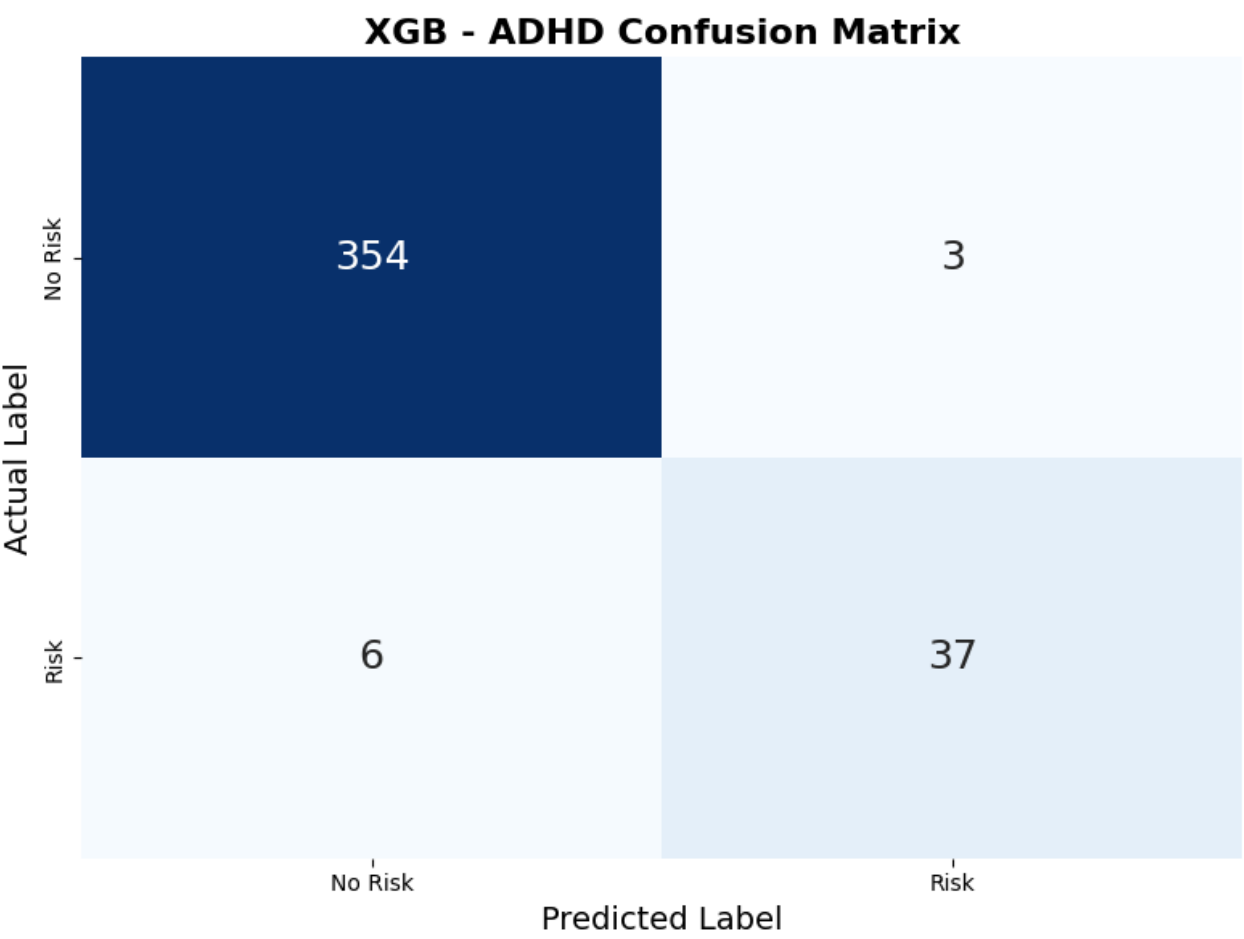
# RF: Combined ROC Curve (All Disorders)



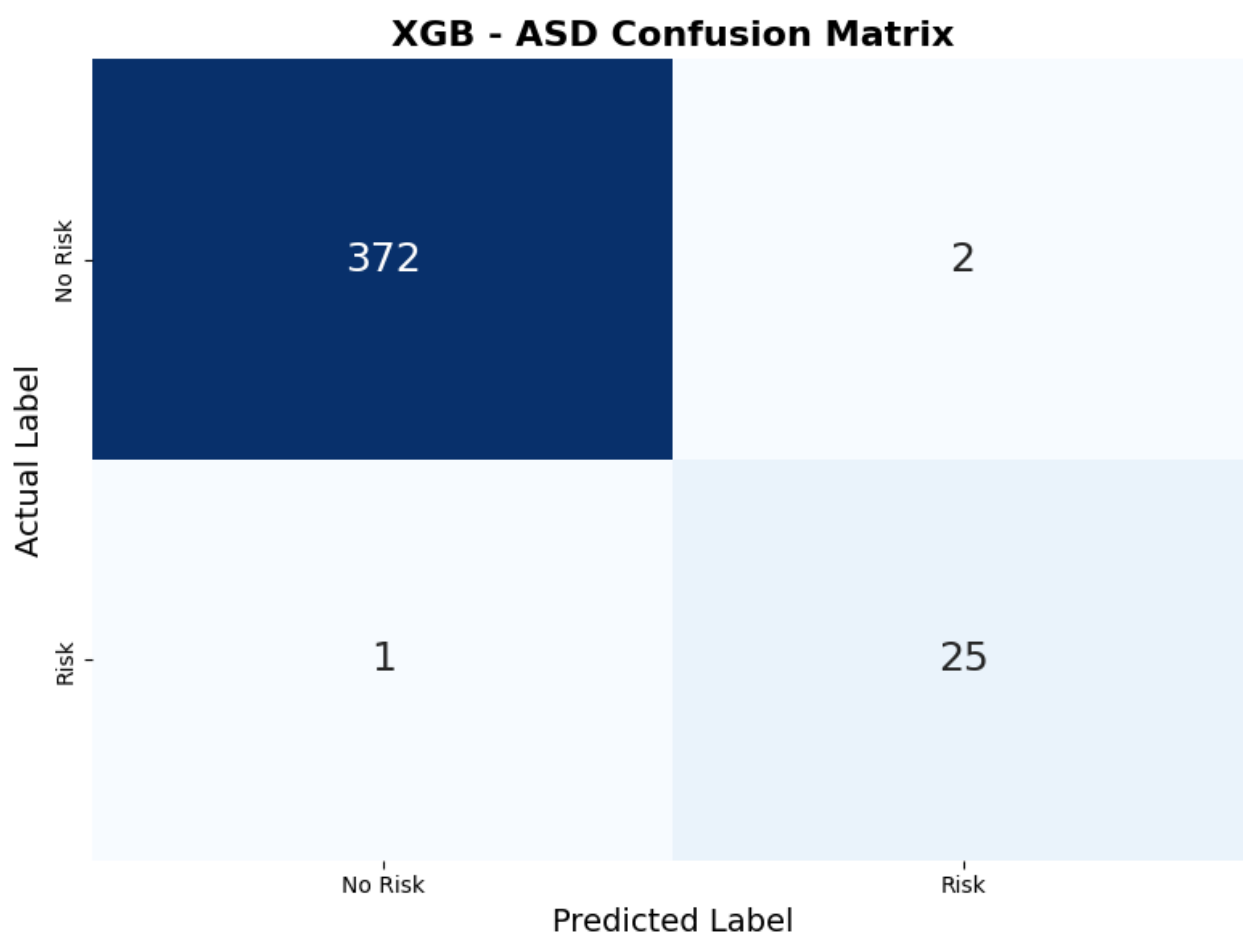
# Random Forest Feature Importance



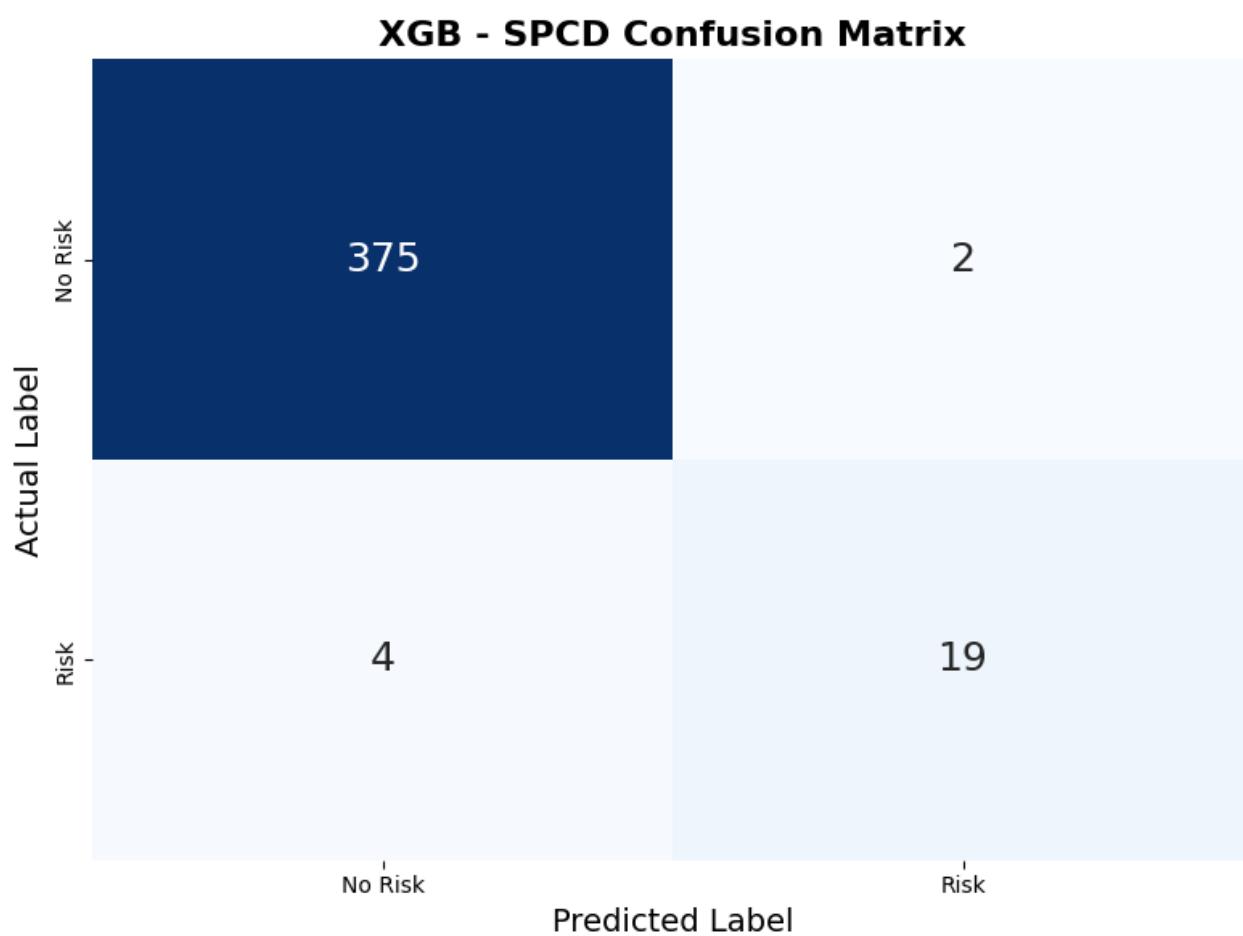
# XGB: ADHD Confusion Matrix



# XGB: ASD Confusion Matrix

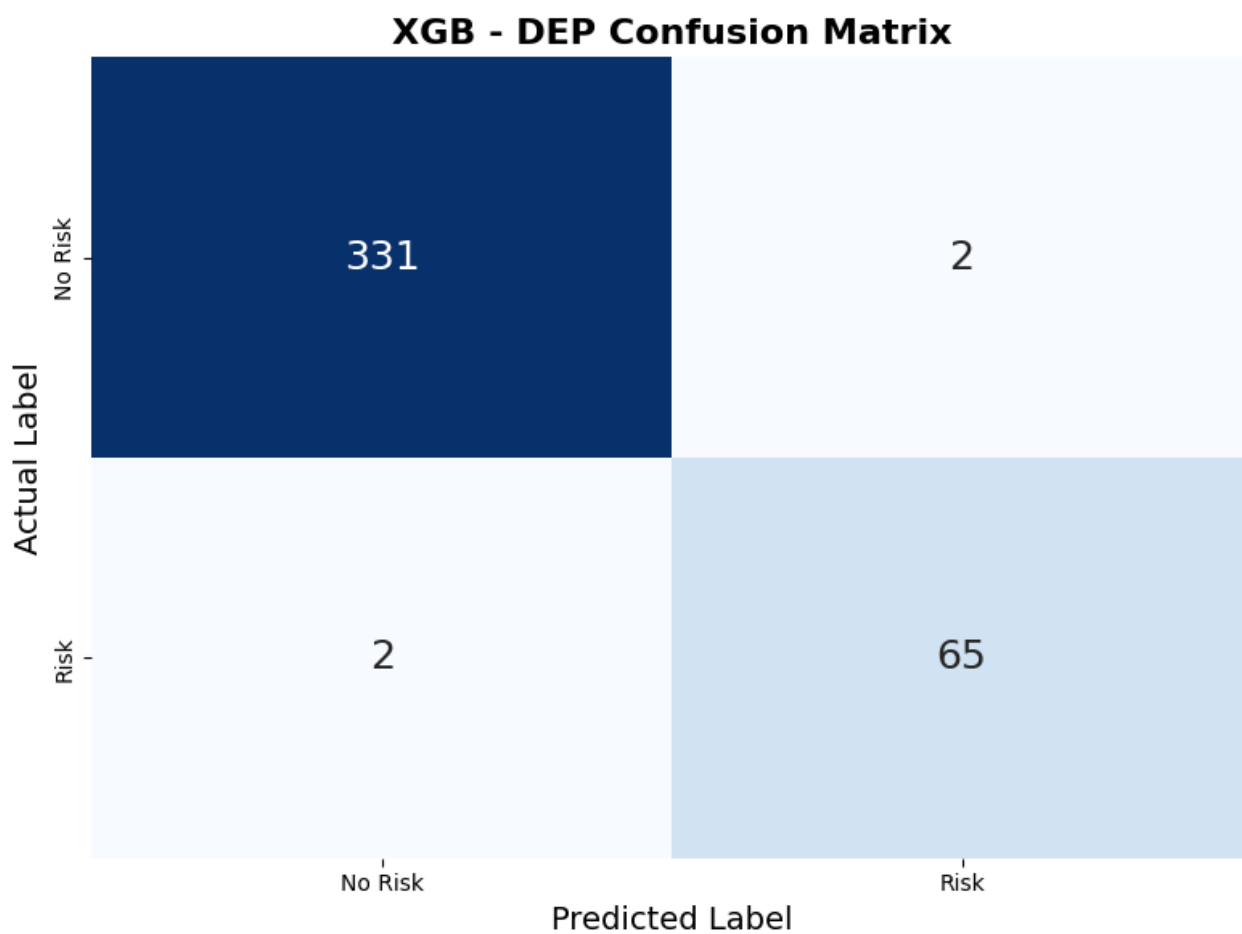


# XGB: SPCD Confusion Matrix

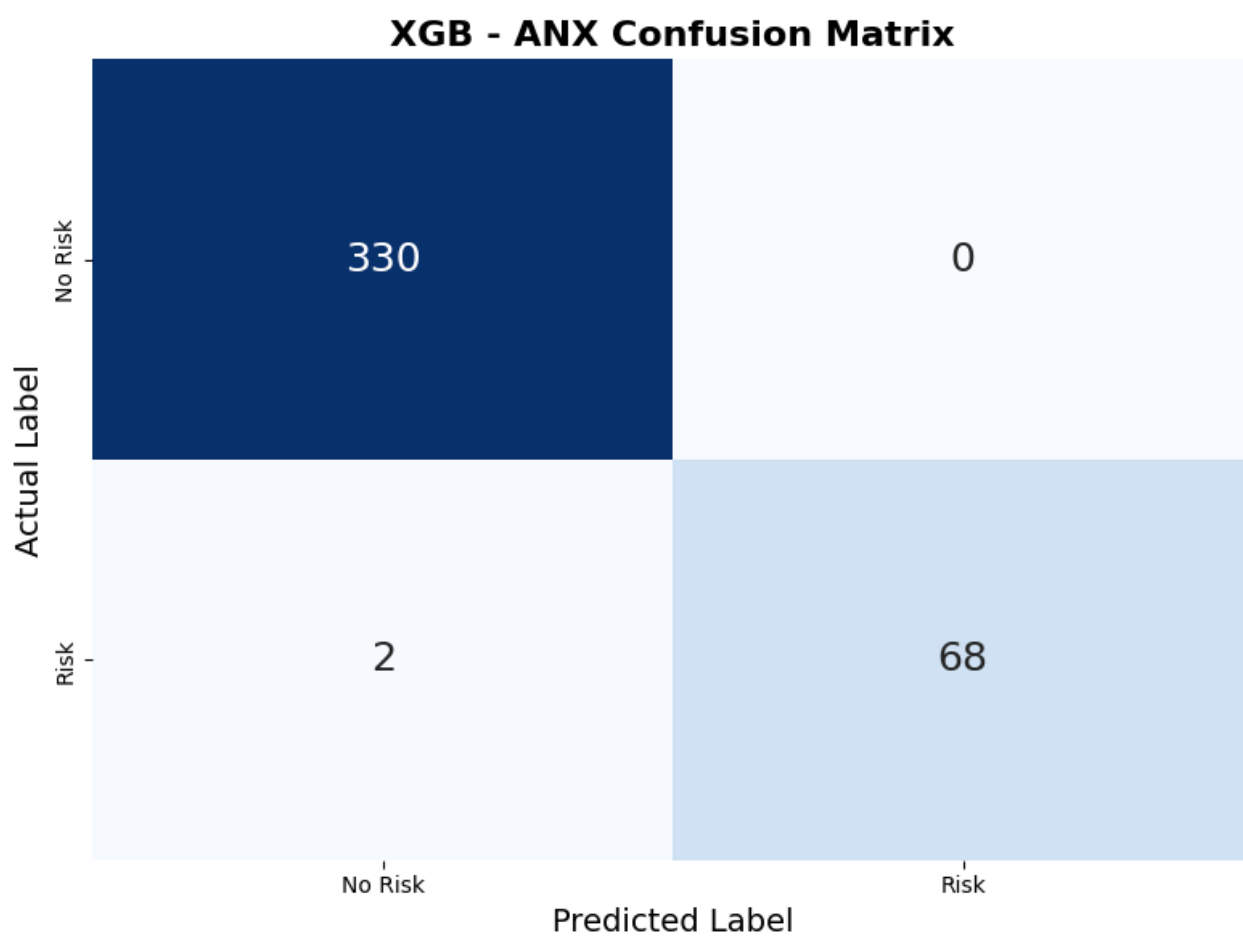




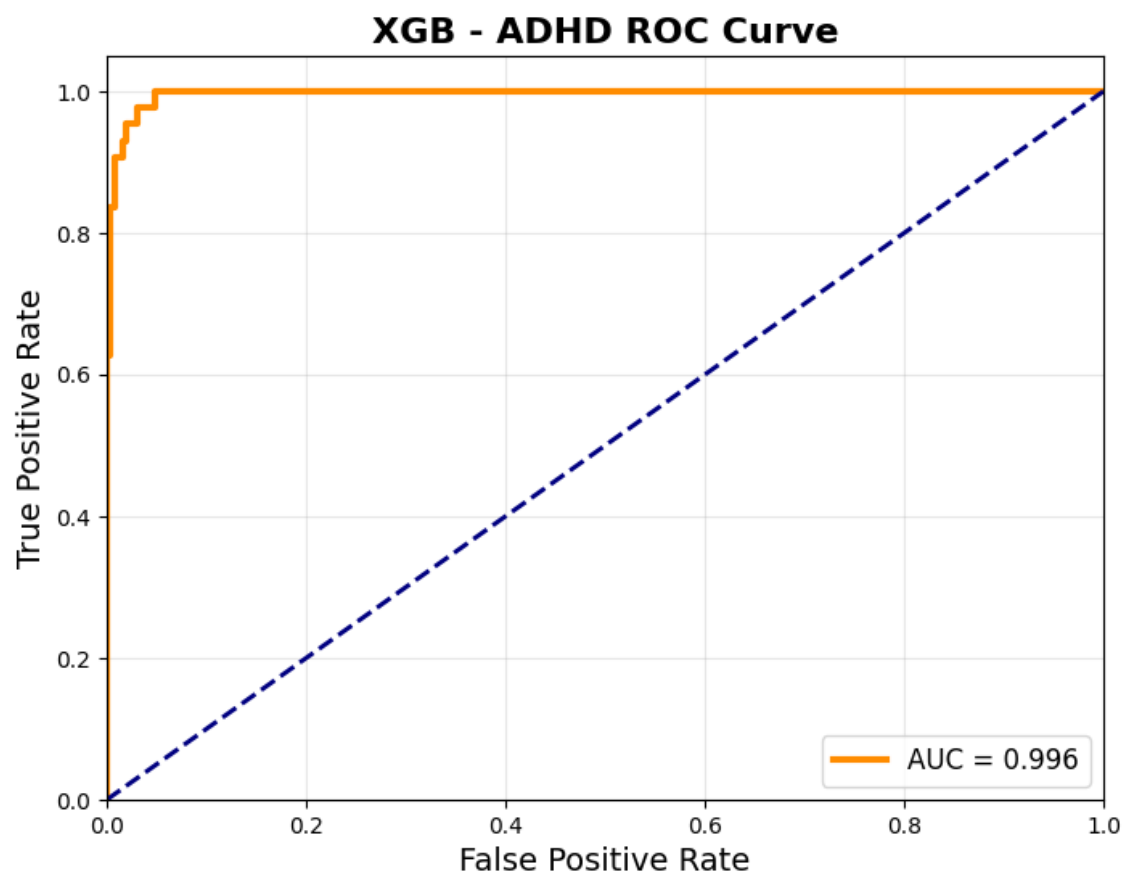
# XGB: DEP Confusion Matrix



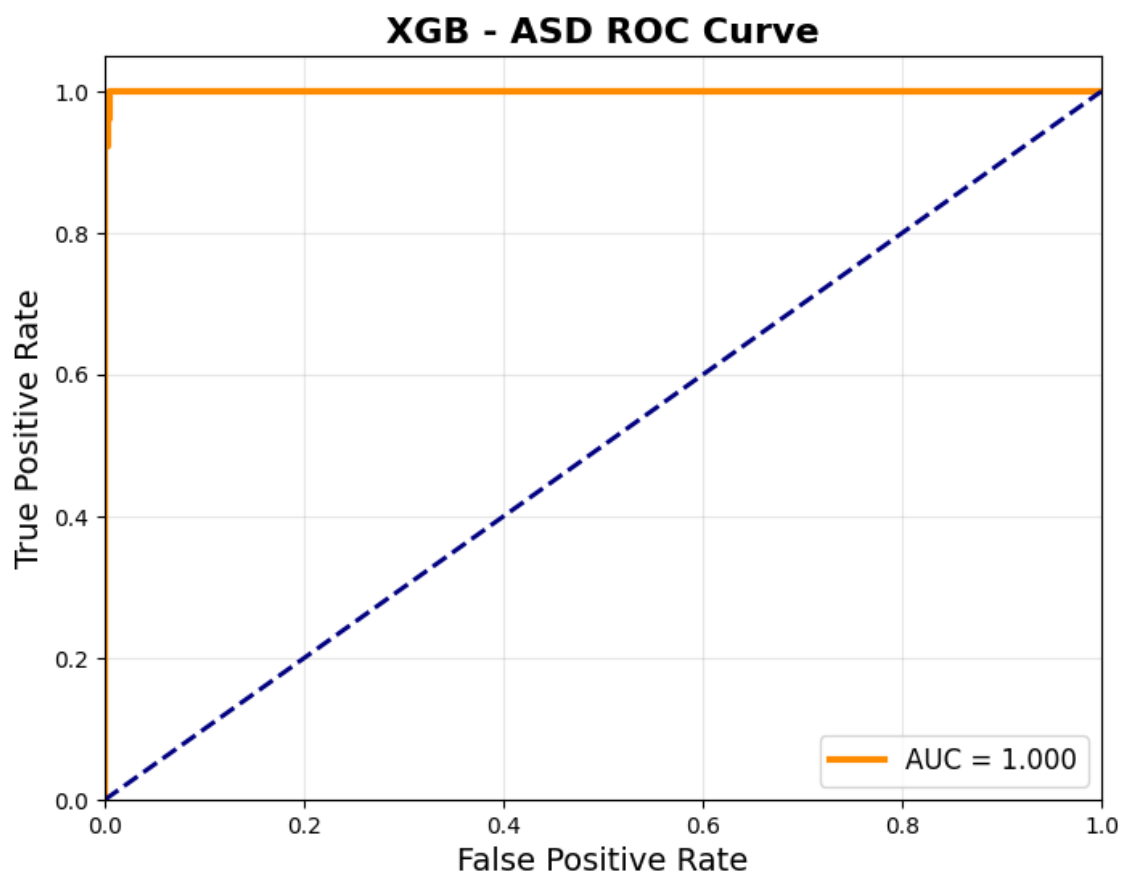
# XGB: ANX Confusion Matrix



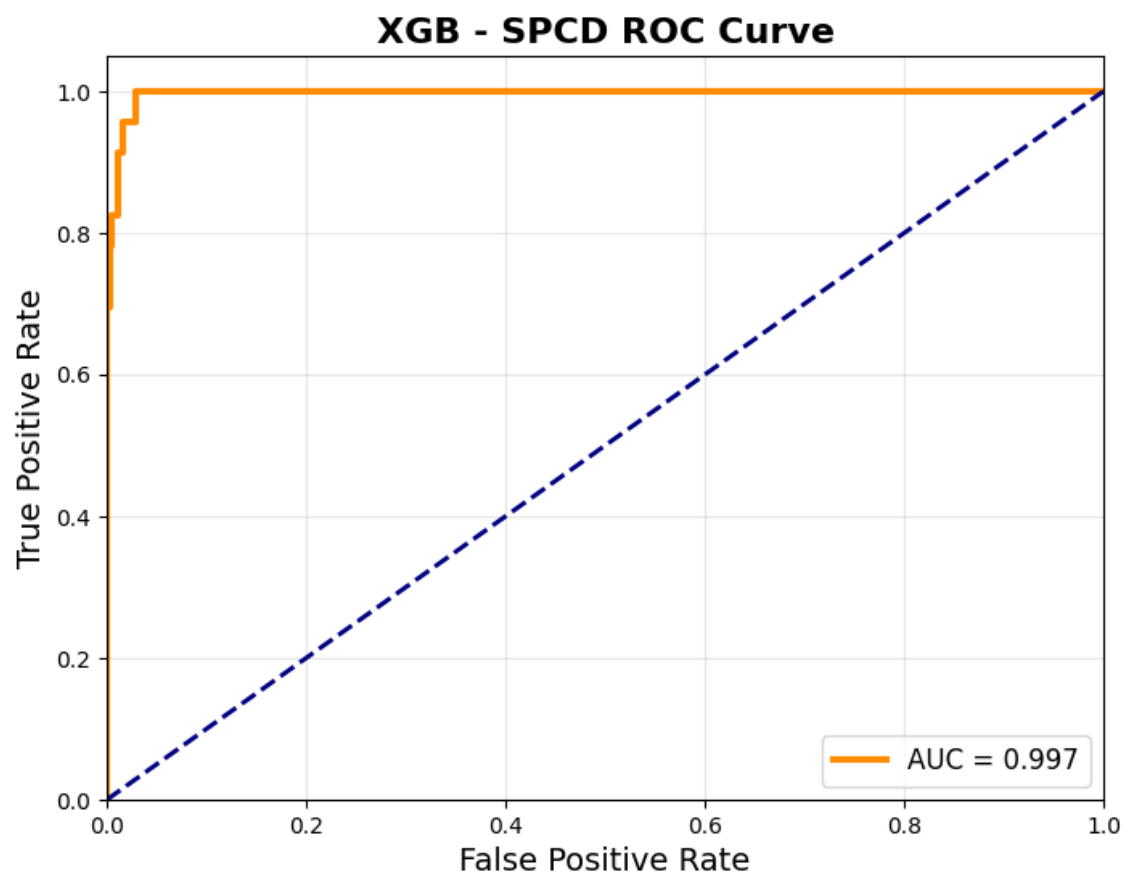
# XGB: ADHD ROC Curve



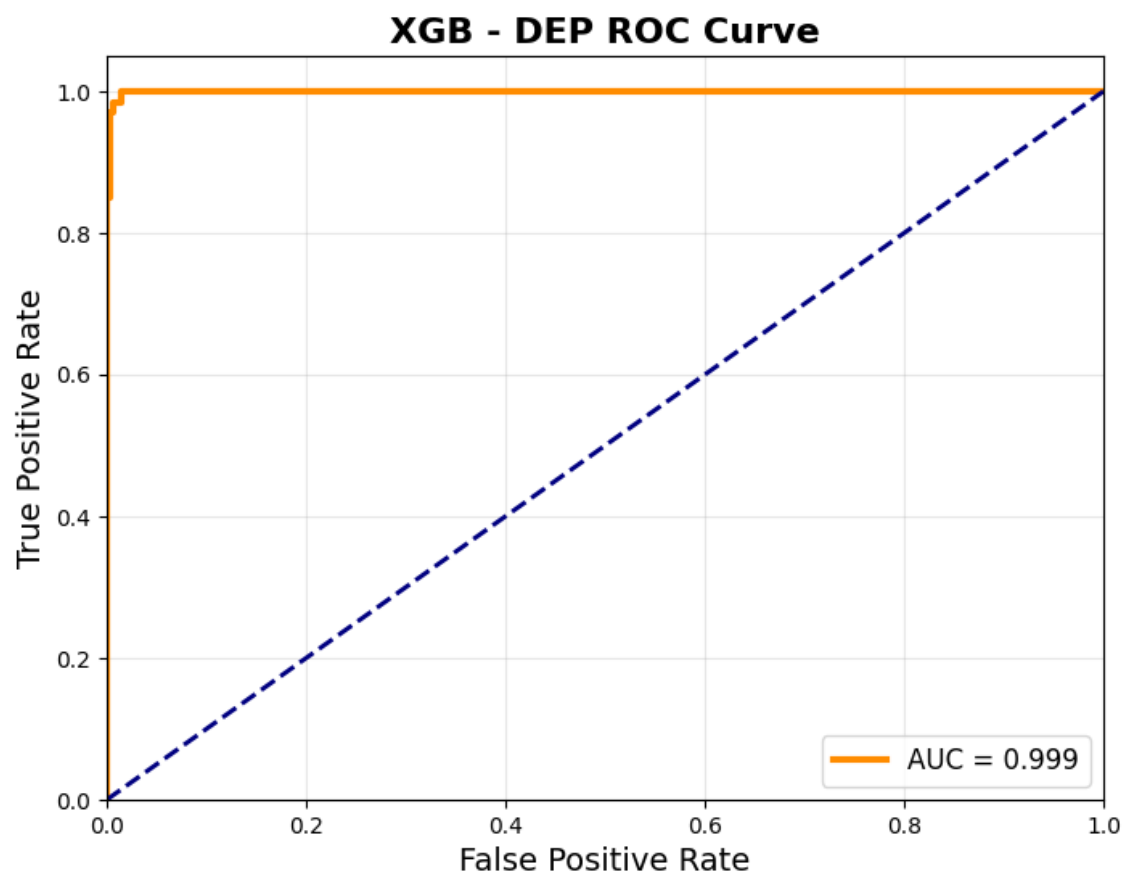
# XGB: ASD ROC Curve



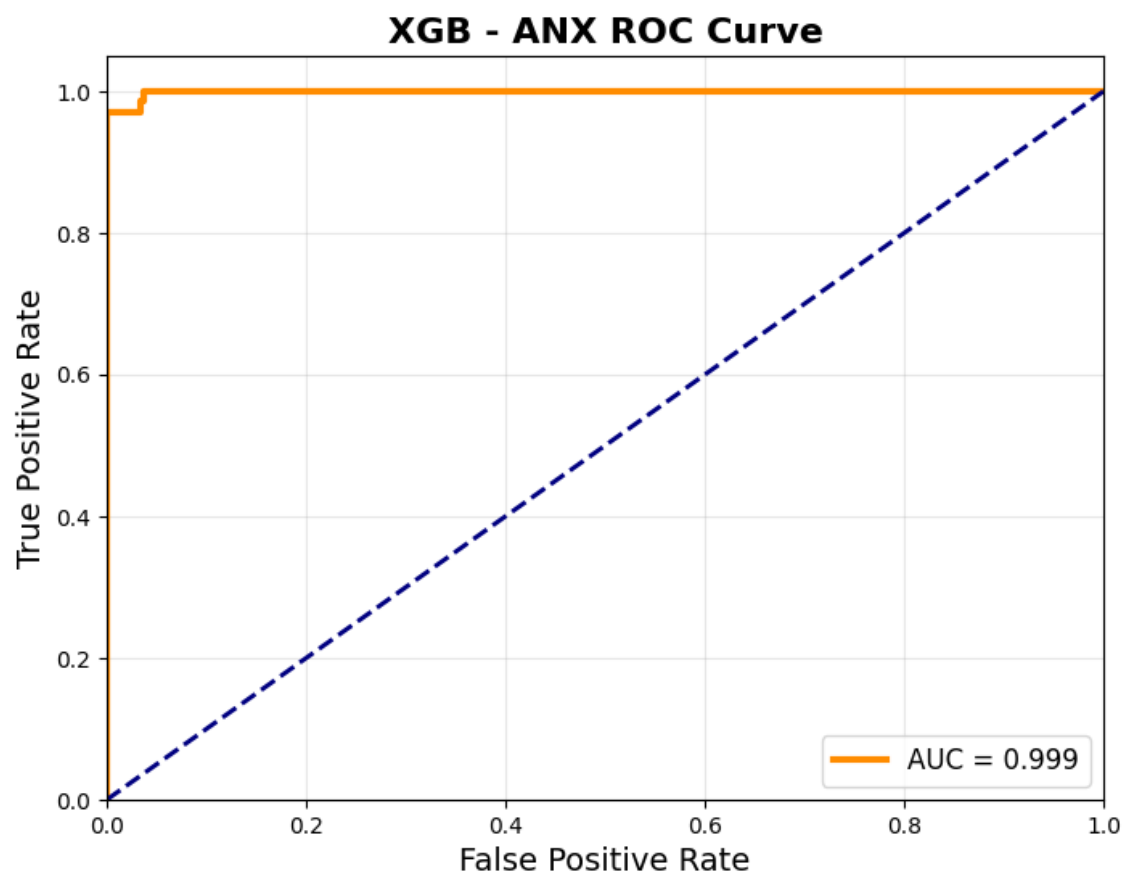
# XGB: SPCD ROC Curve



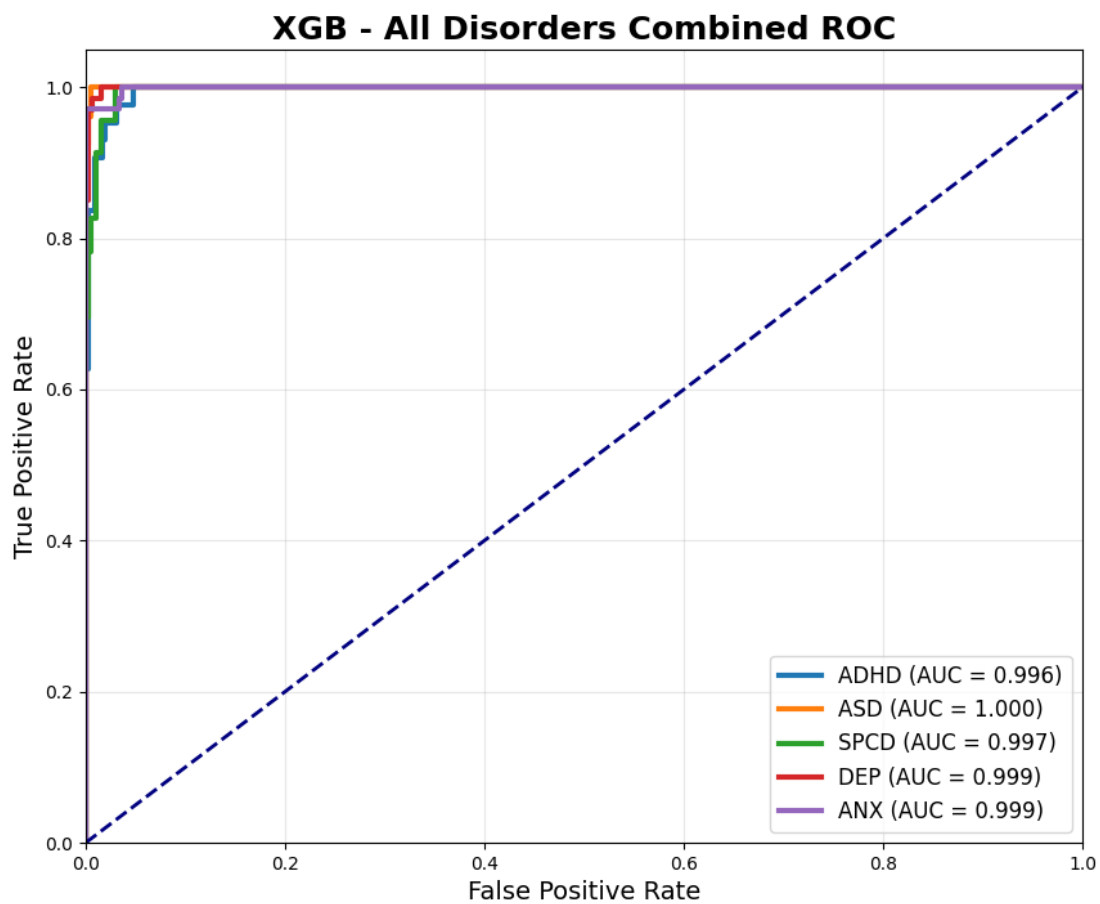
# XGB: DEP ROC Curve



# XGB: ANX ROC Curve

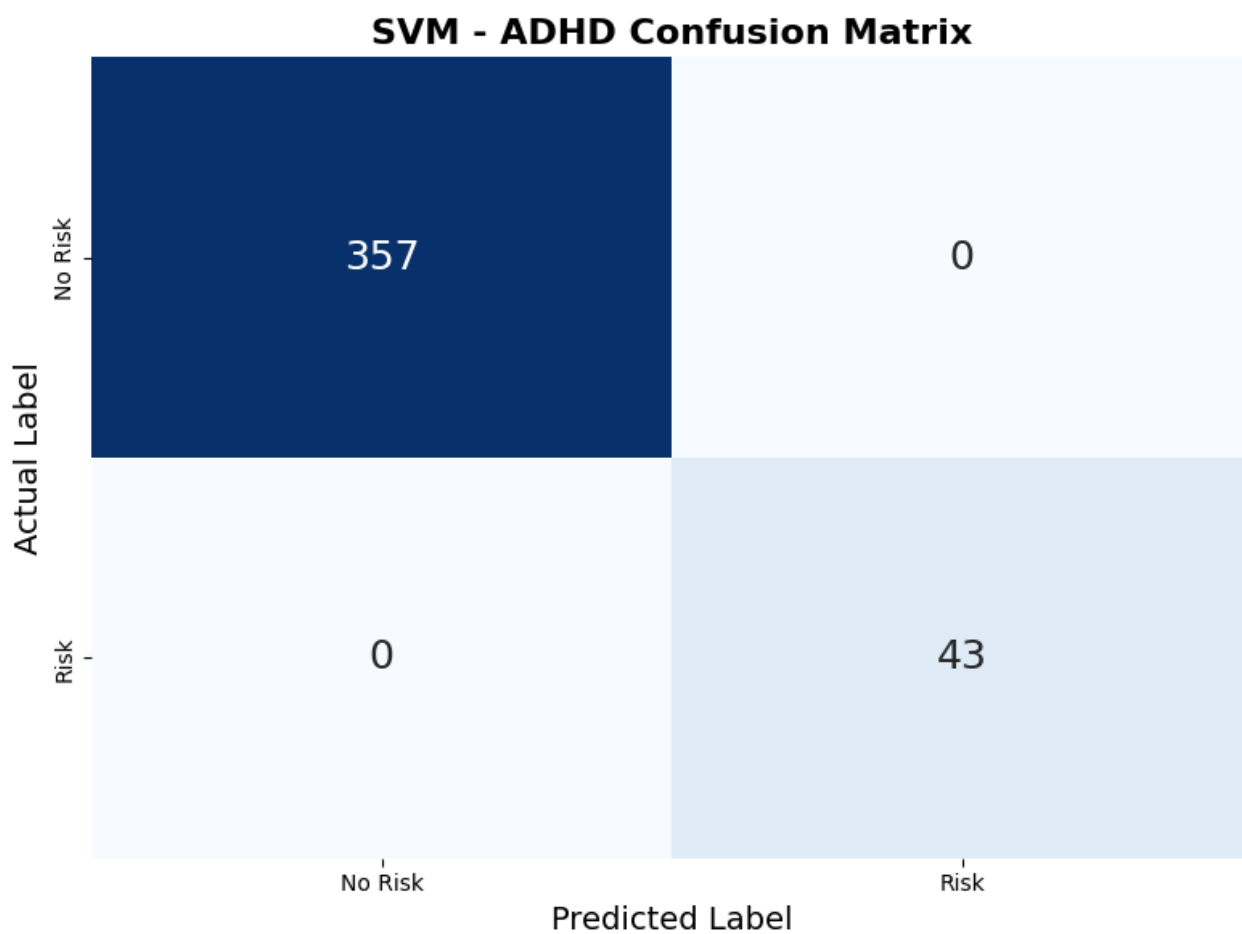


# XGB: Combined ROC Curve (All Disorders)

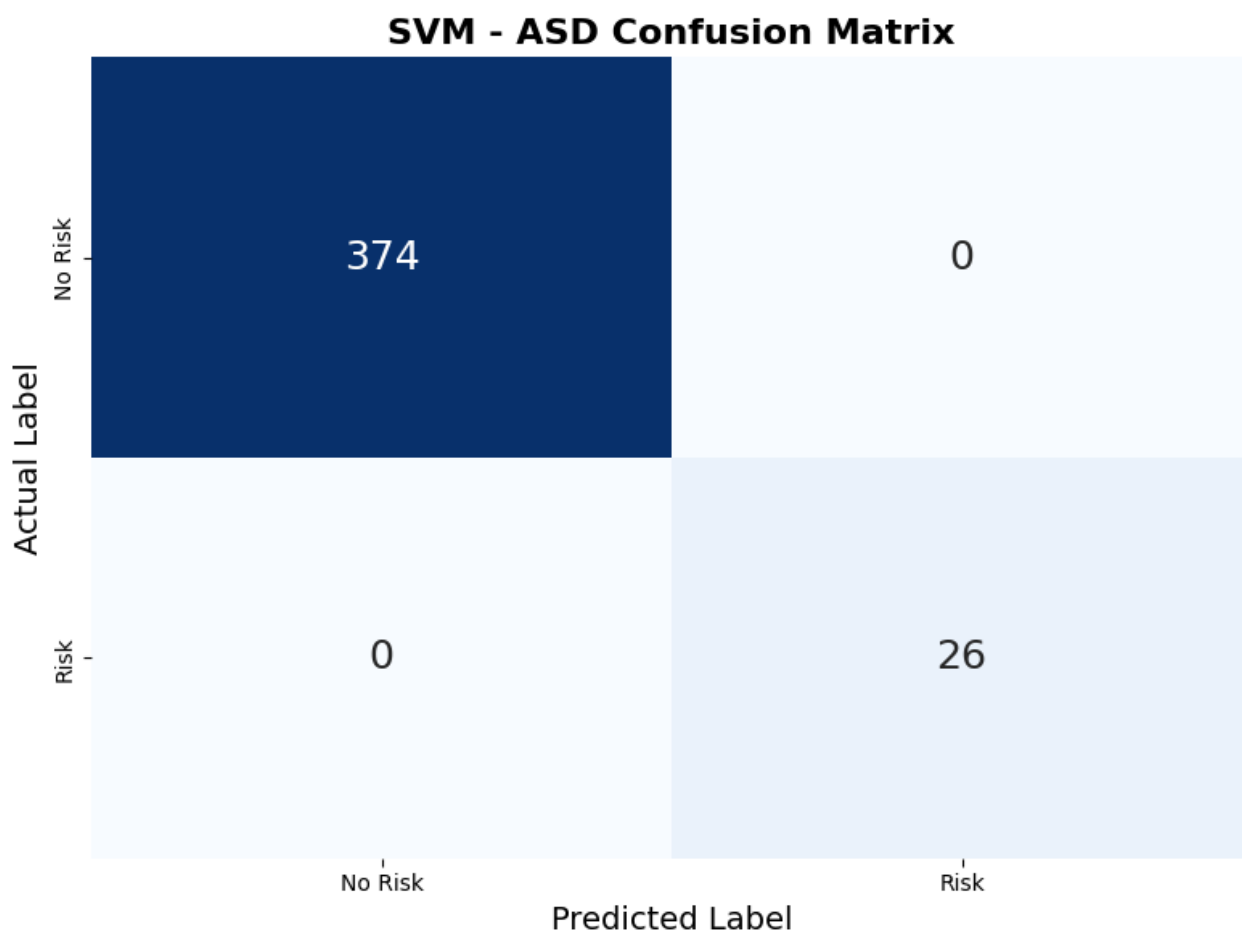




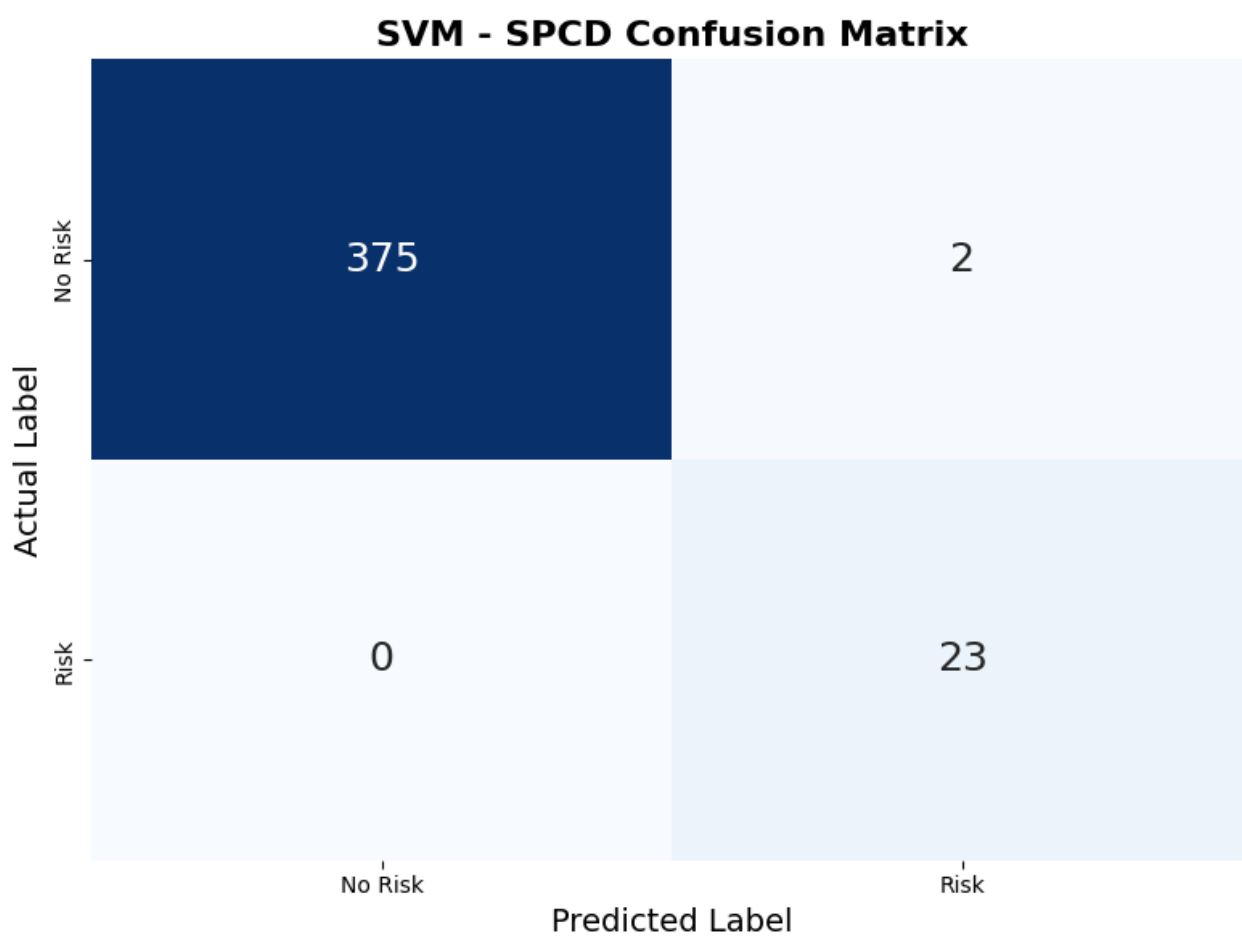
# SVM: ADHD Confusion Matrix



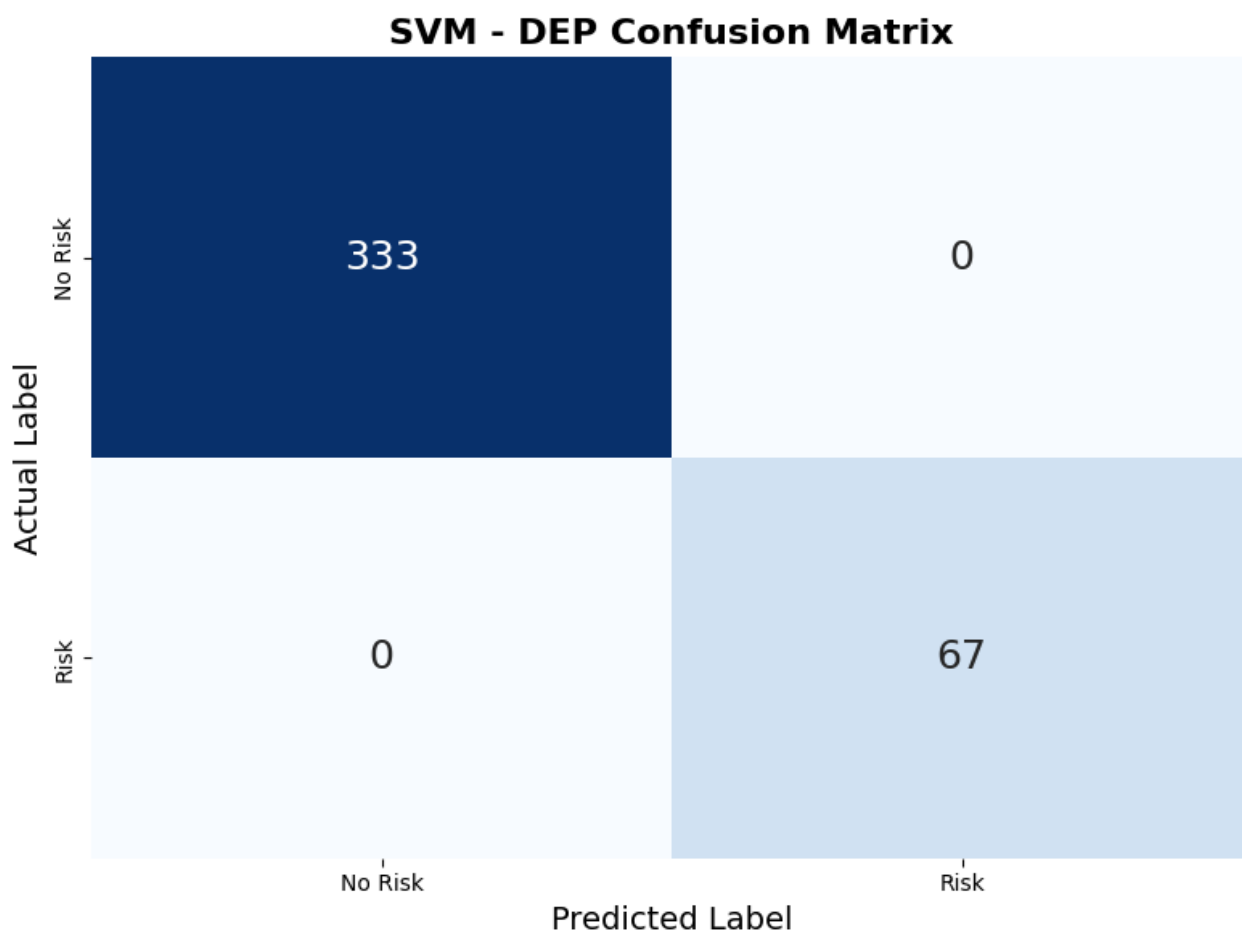
# SVM: ASD Confusion Matrix



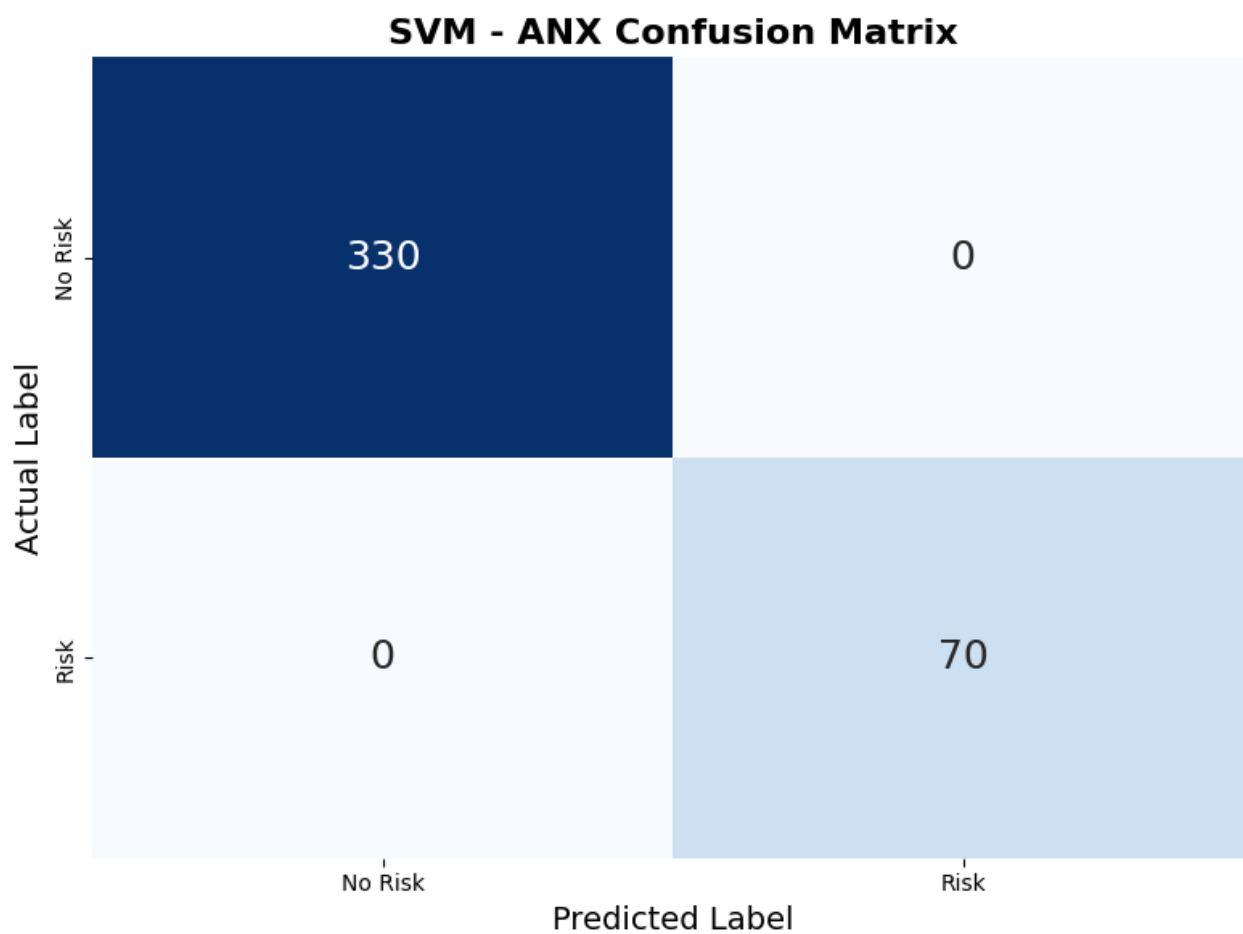
# SVM: SPCD Confusion Matrix



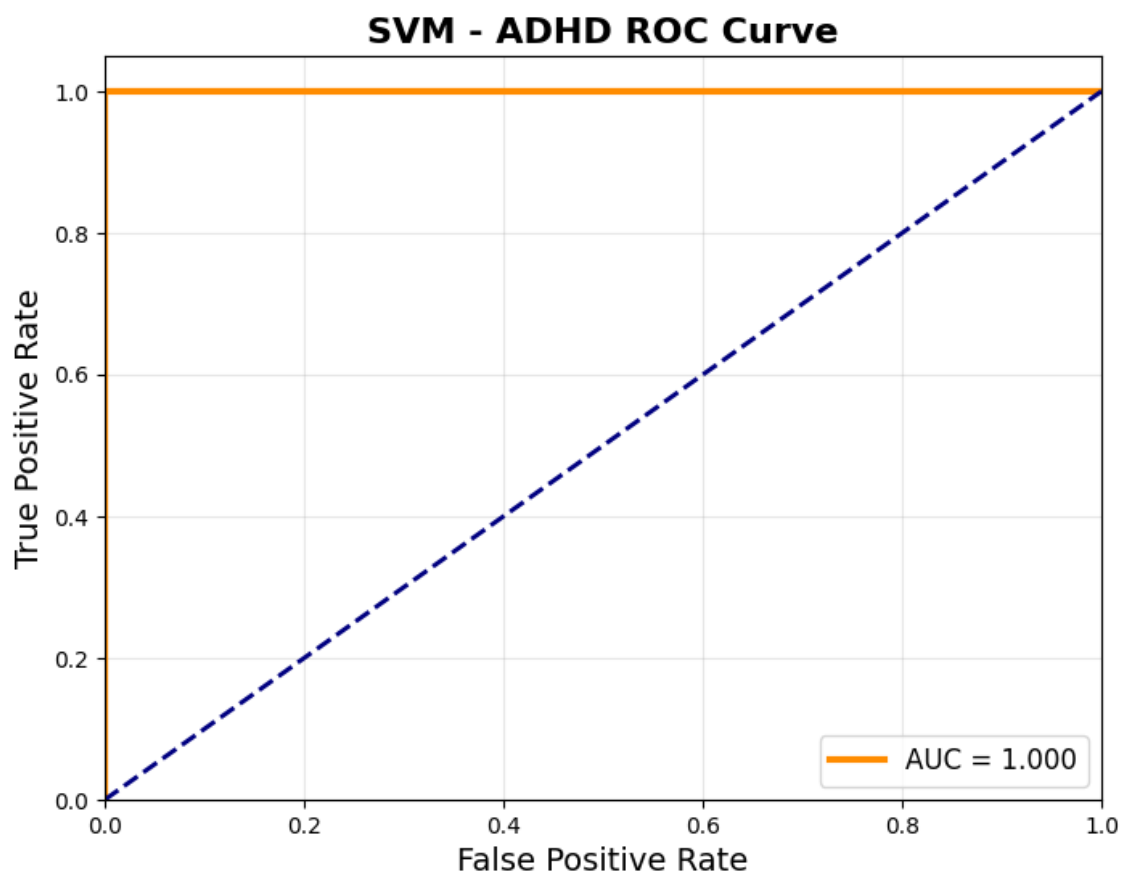
# SVM: DEP Confusion Matrix



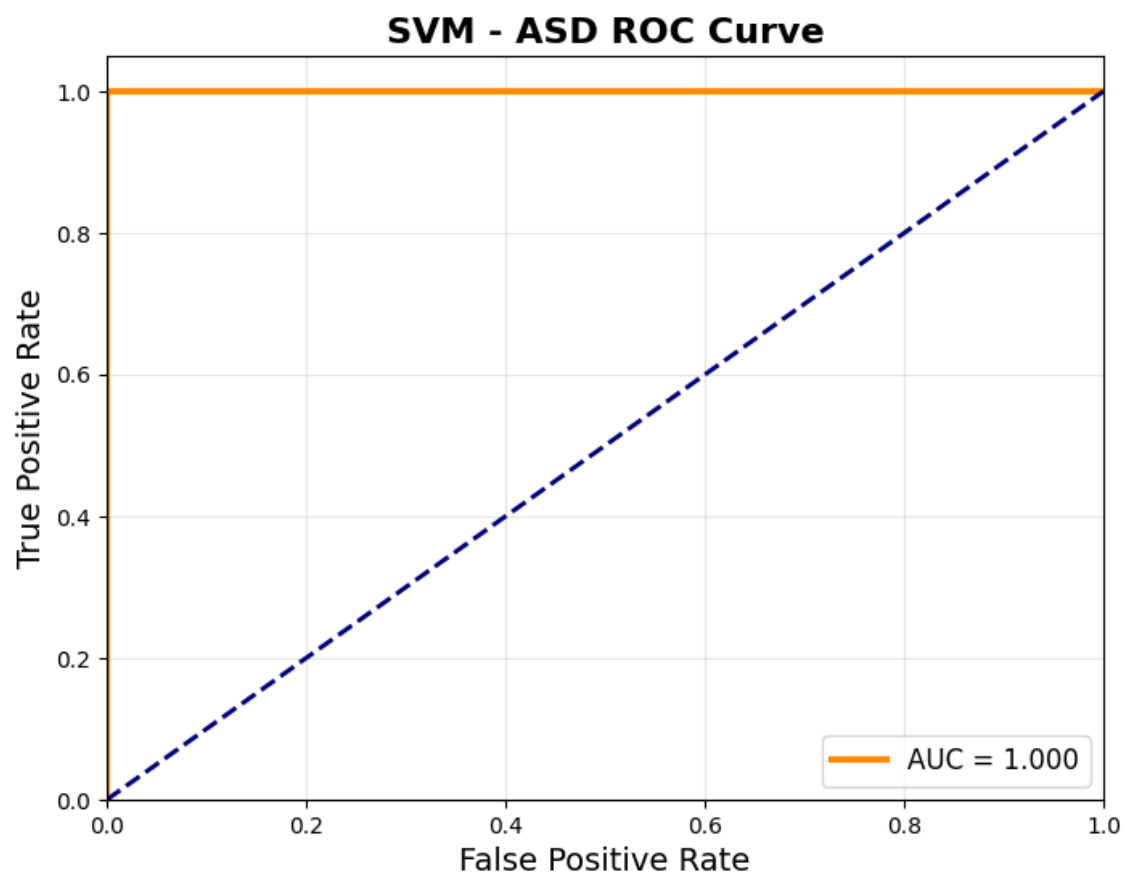
# SVM: ANX Confusion Matrix



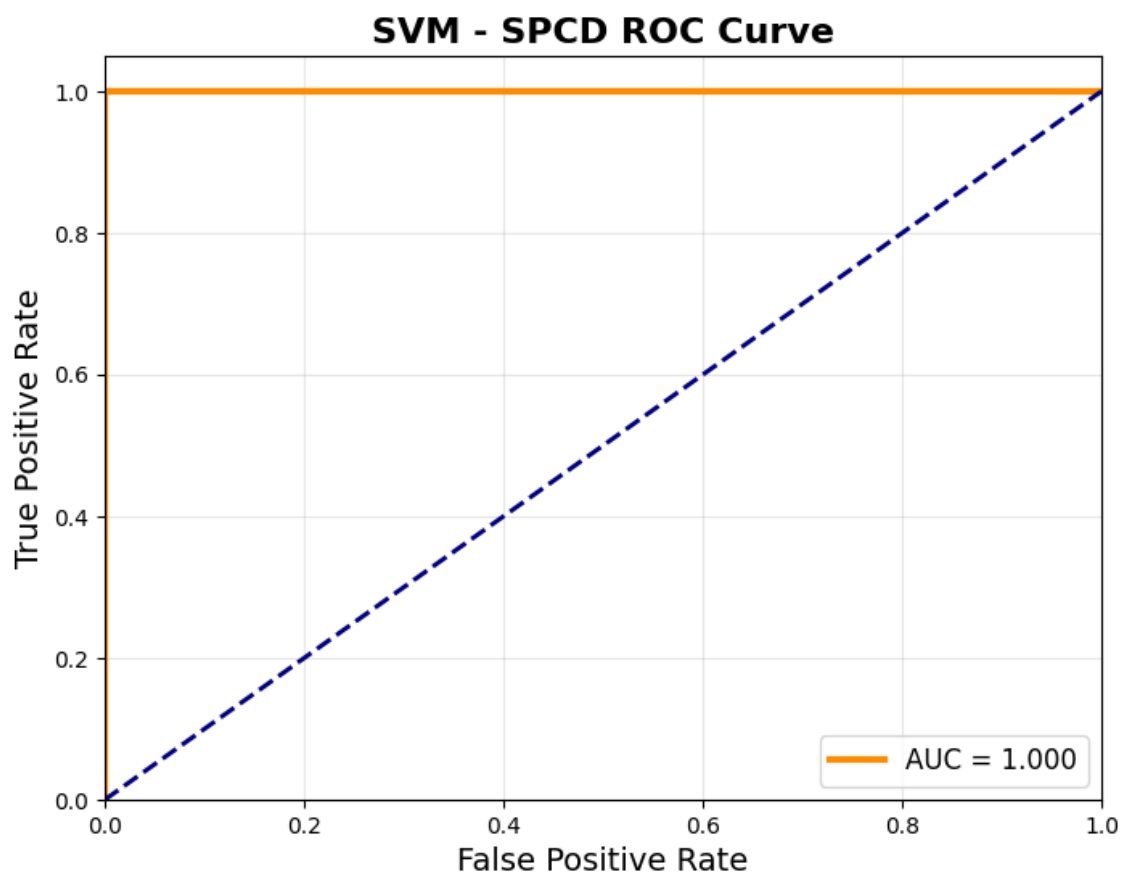
# SVM: ADHD ROC Curve



# SVM: ASD ROC Curve

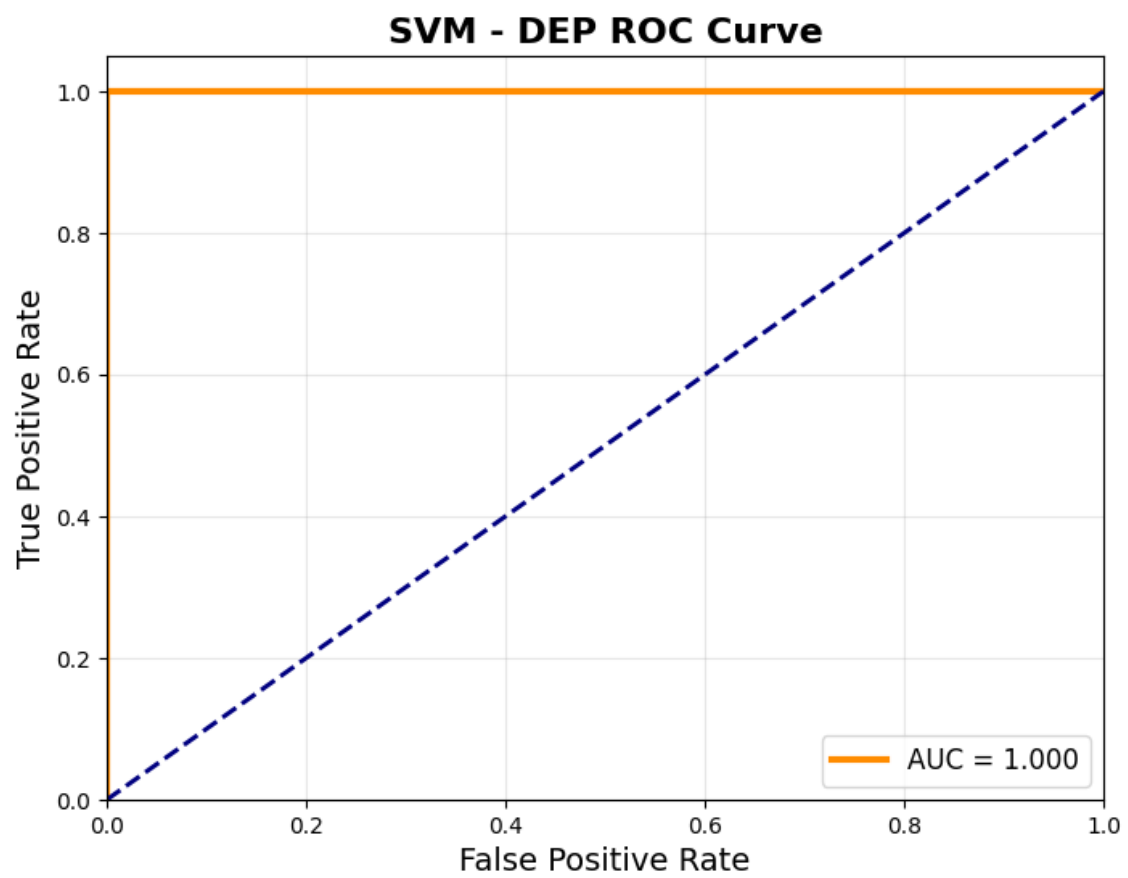


# SVM: SPCD ROC Curve

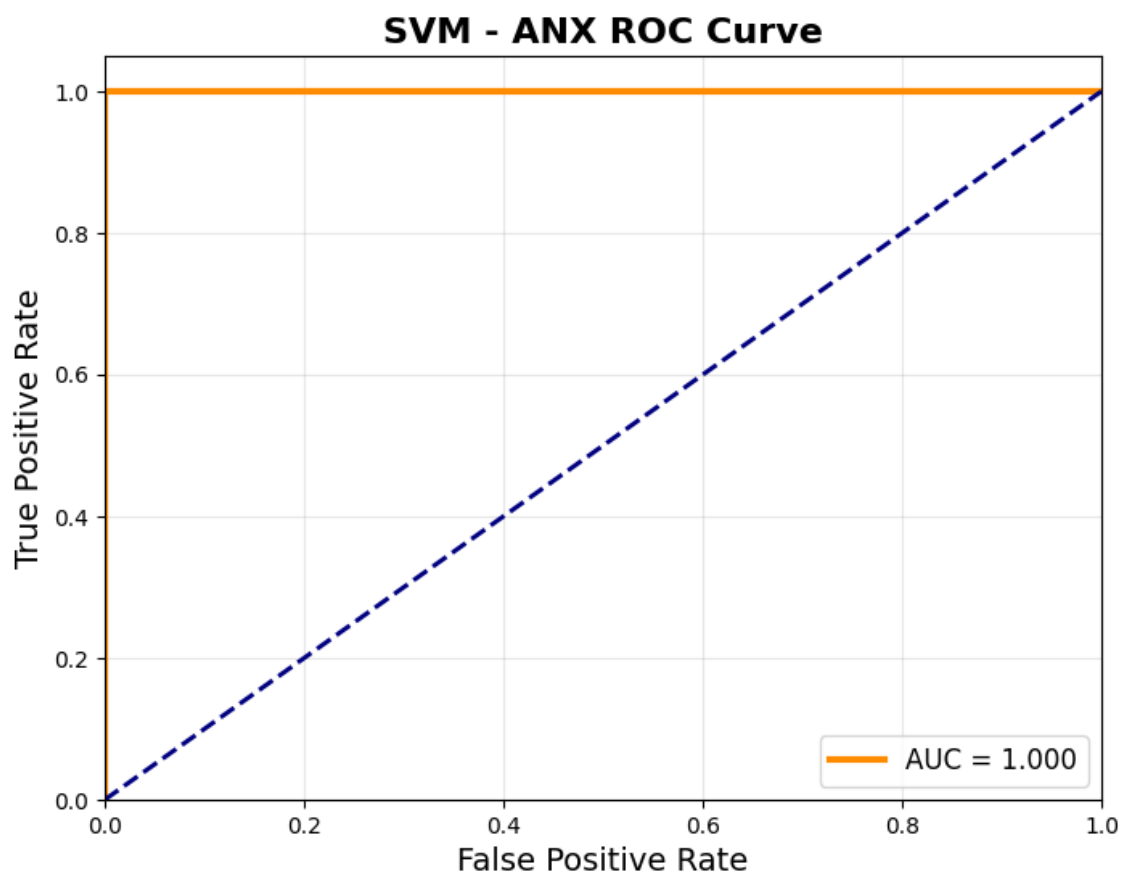




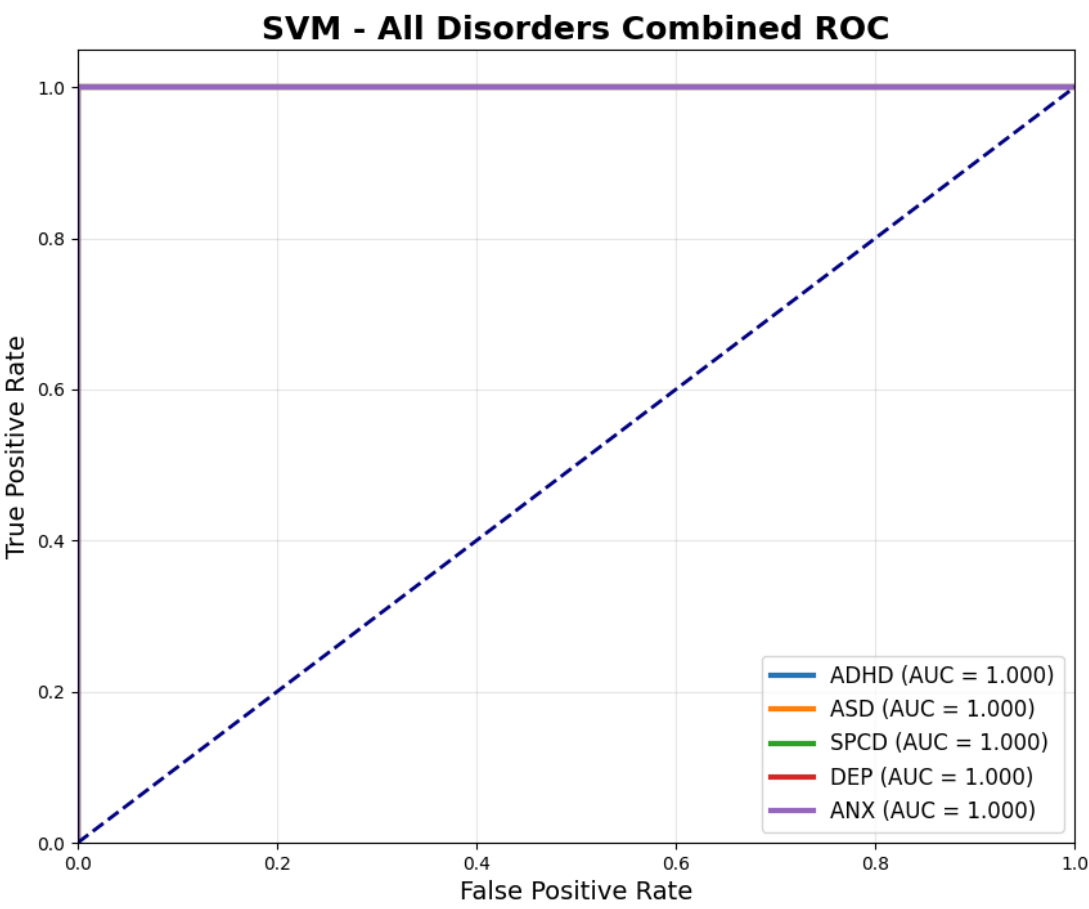
# SVM: DEP ROC Curve



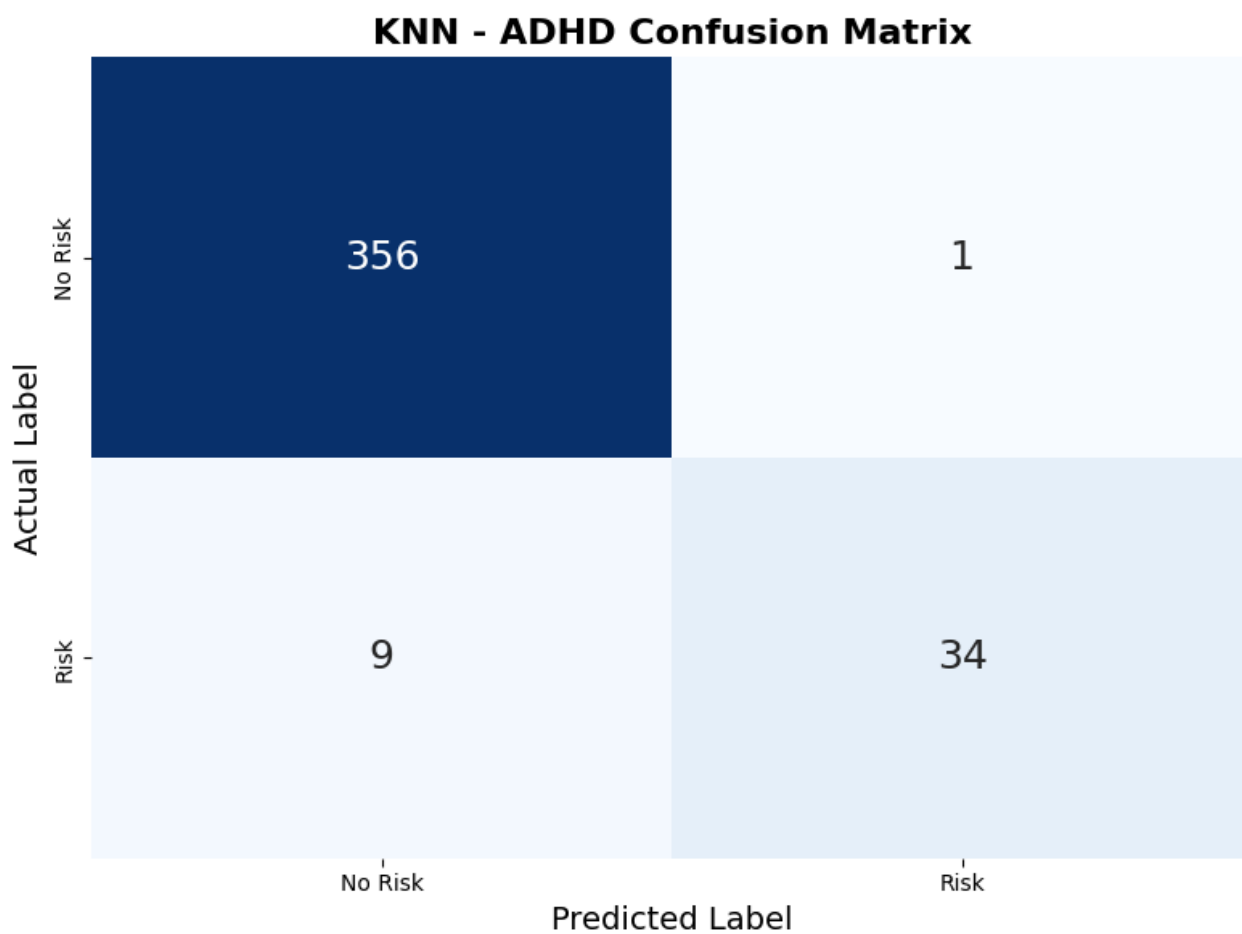
# SVM: ANX ROC Curve



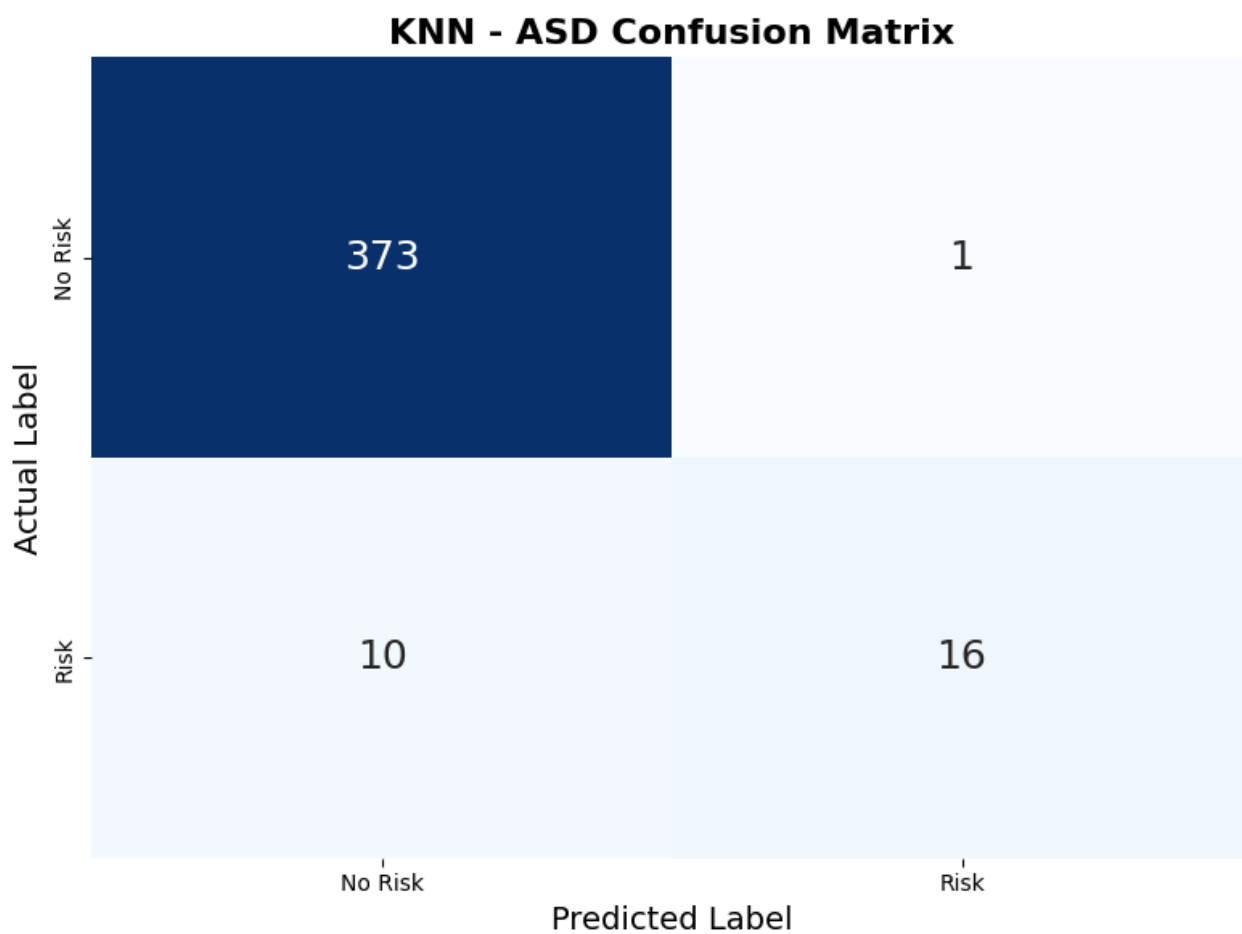
# SVM: Combined ROC Curve (All Disorders)



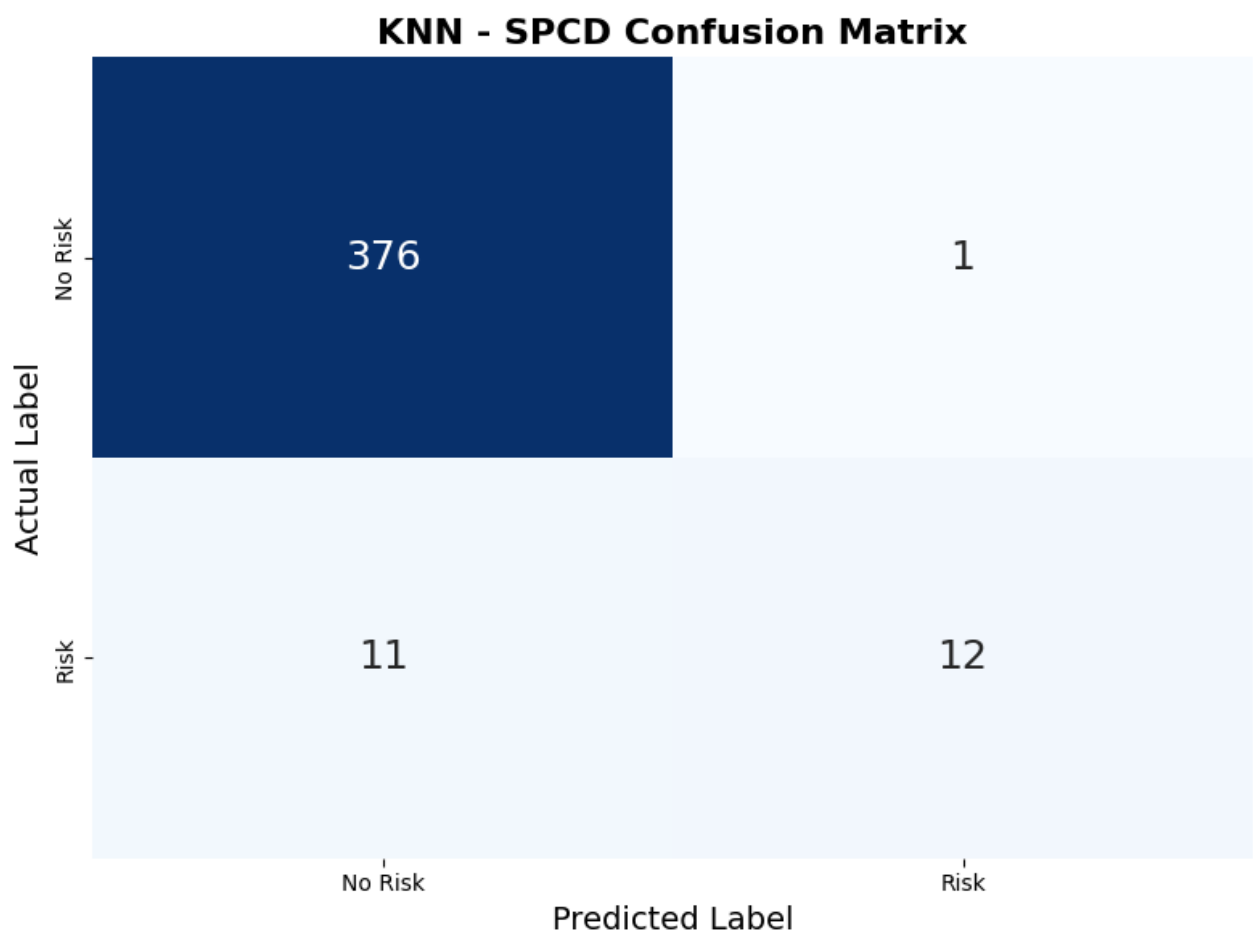
# KNN: ADHD Confusion Matrix



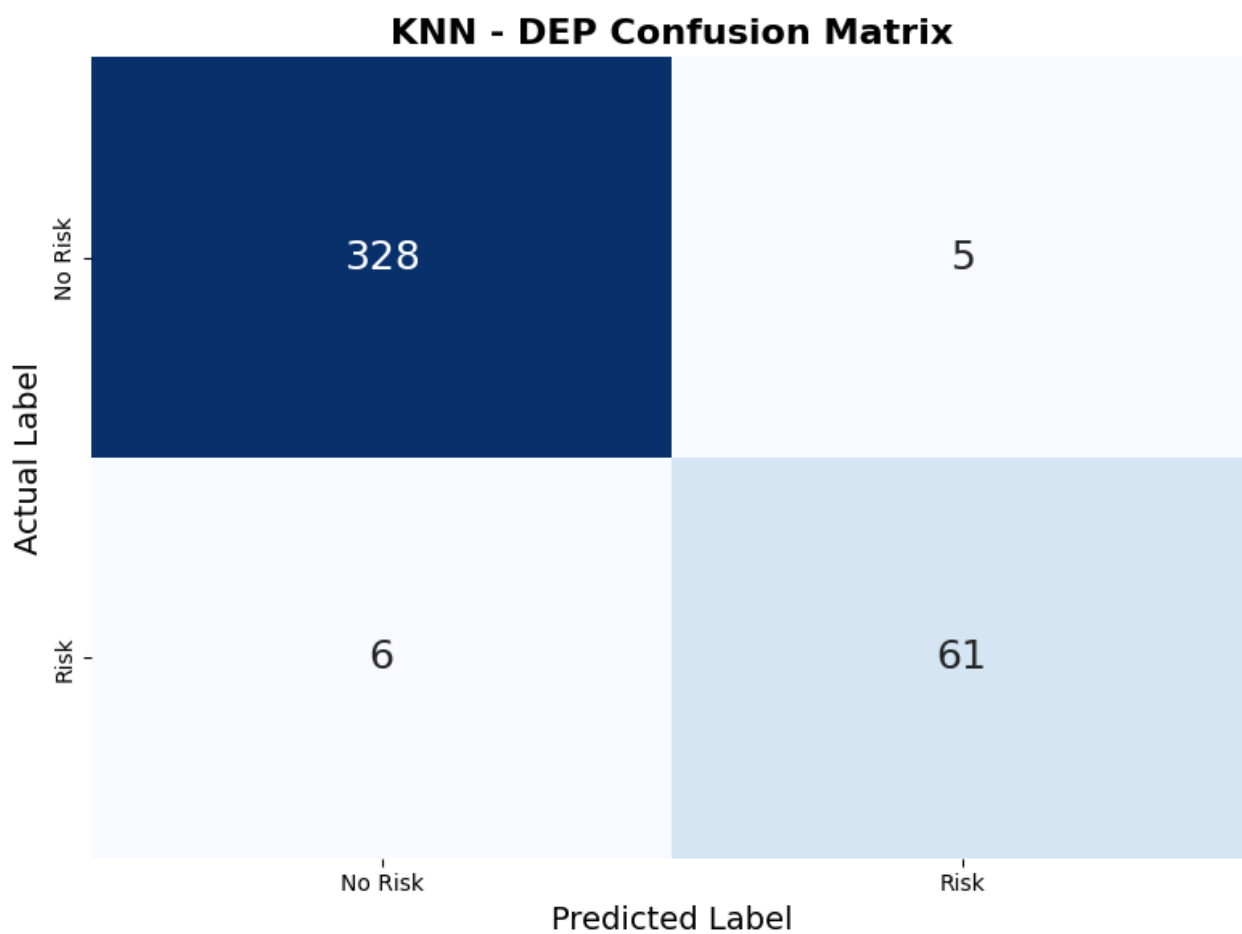
# KNN: ASD Confusion Matrix



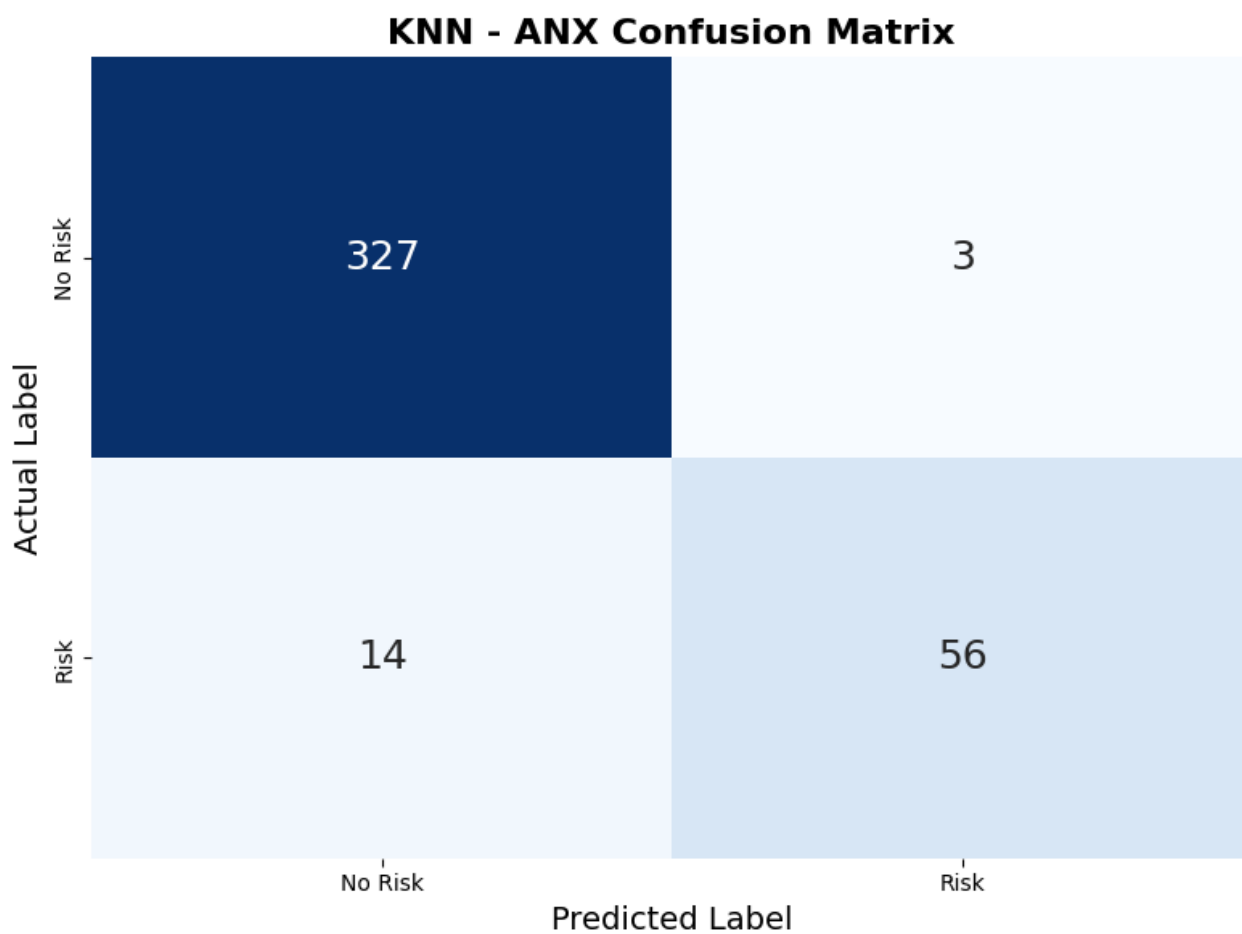
# KNN: SPCD Confusion Matrix



# KNN: DEP Confusion Matrix

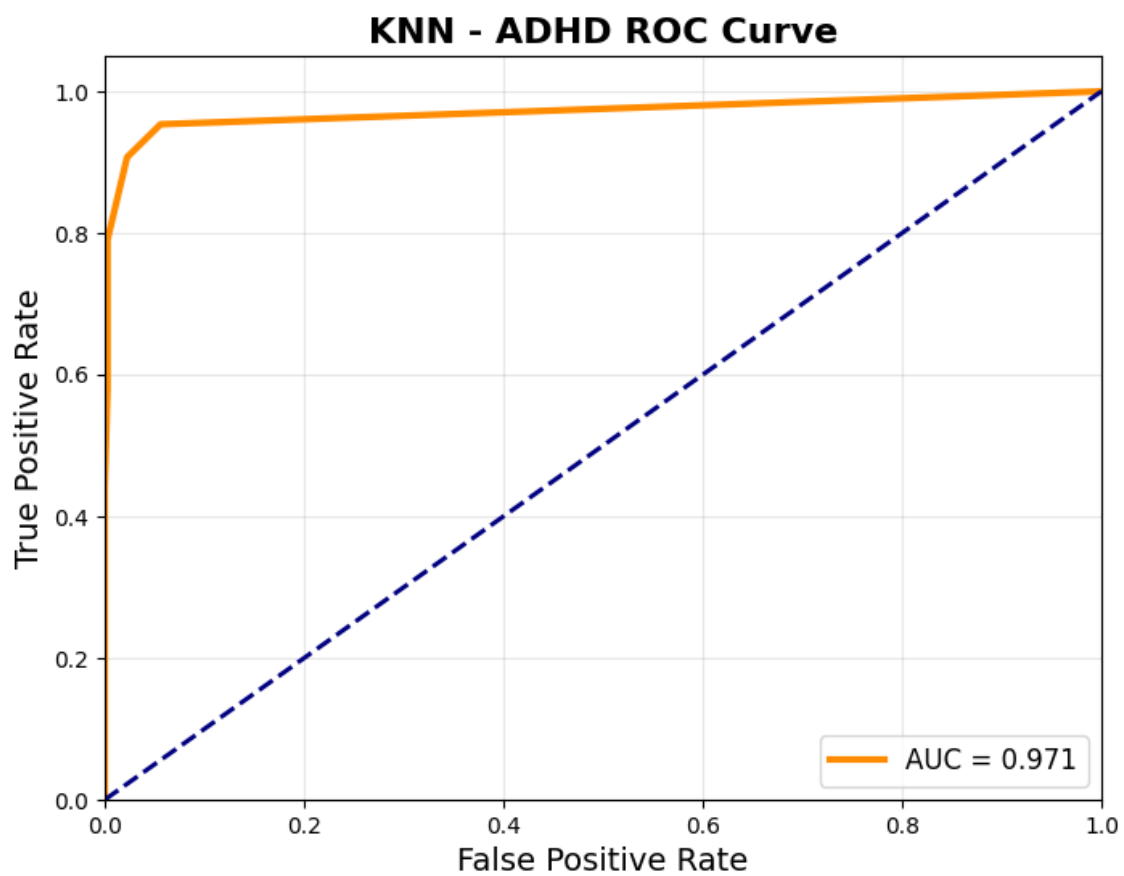


# KNN: ANX Confusion Matrix

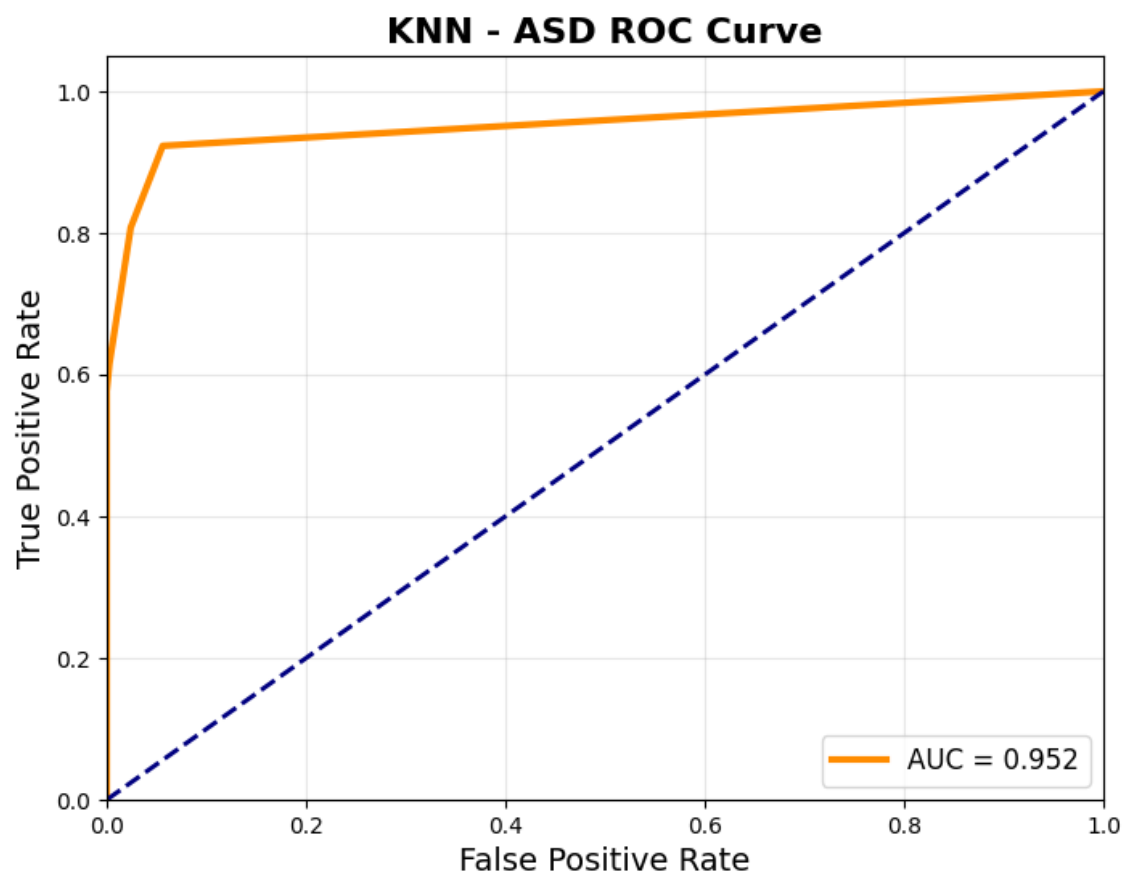




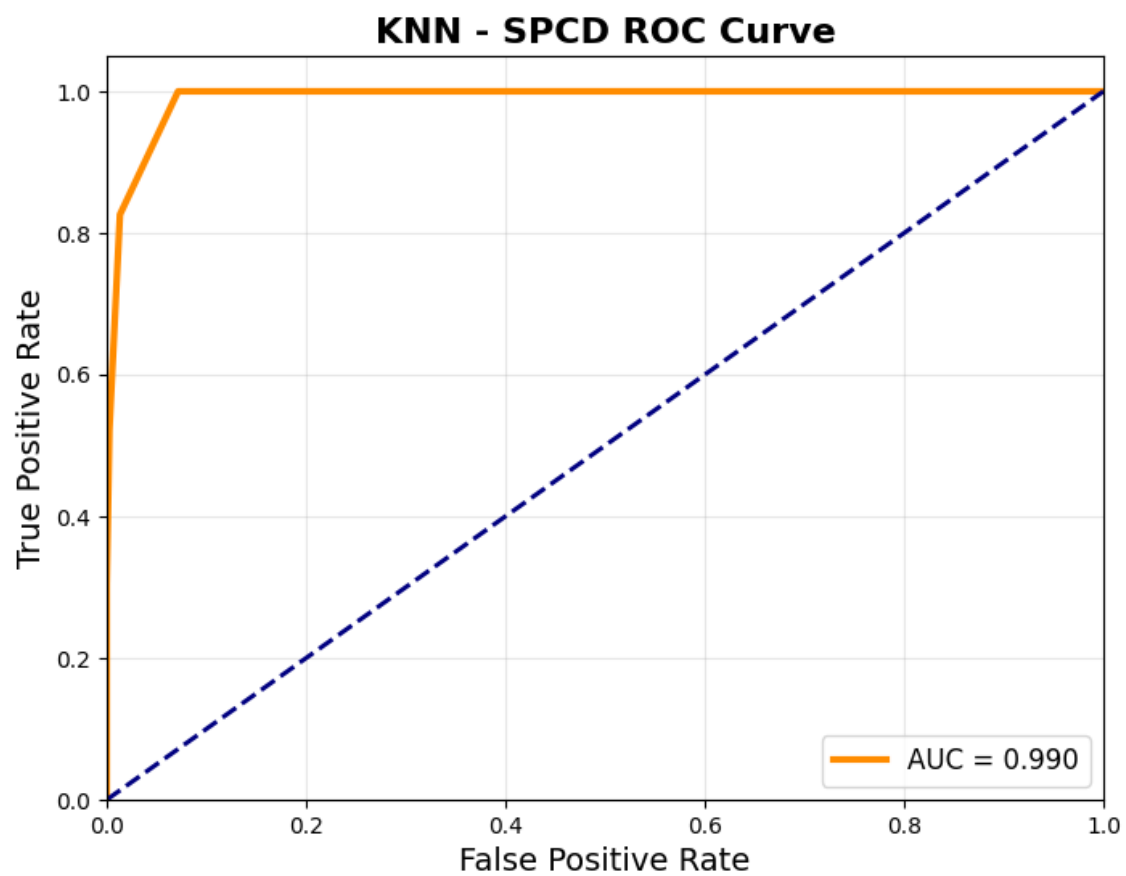
# KNN: ADHD ROC Curve



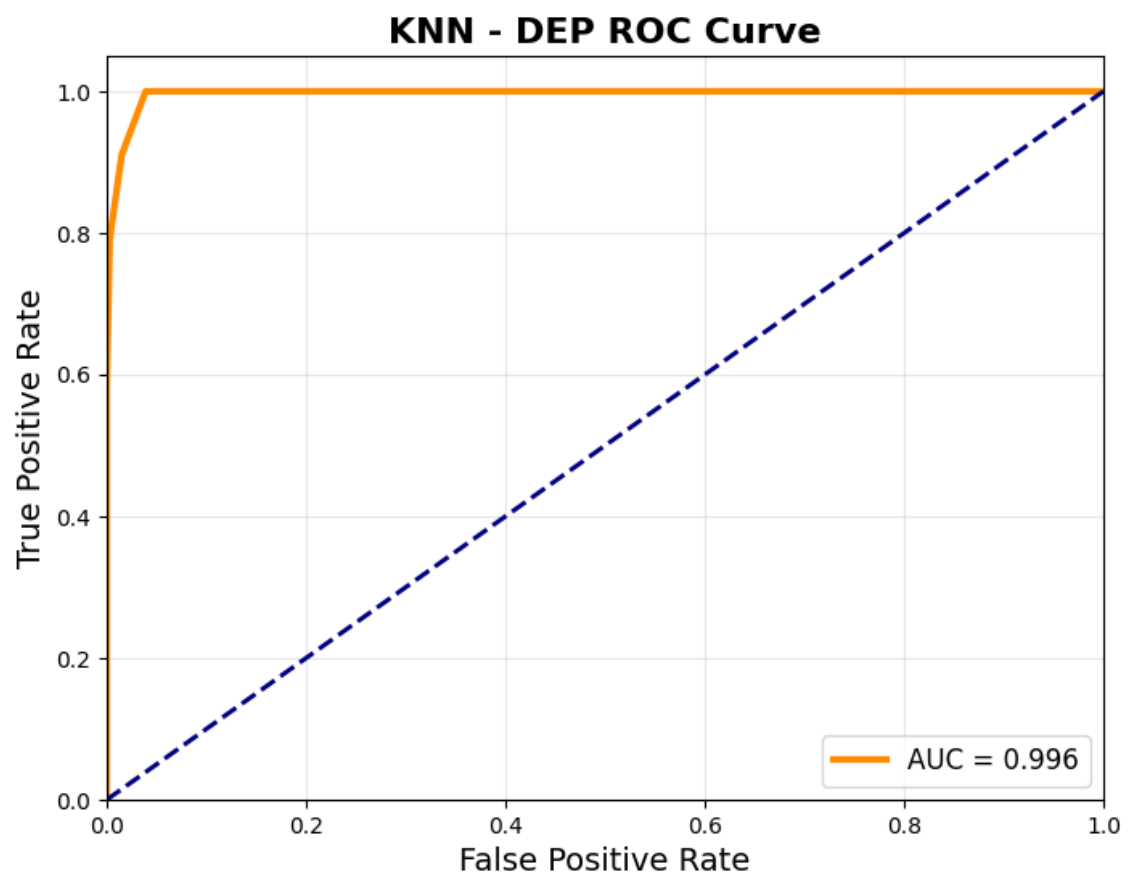
# KNN: ASD ROC Curve



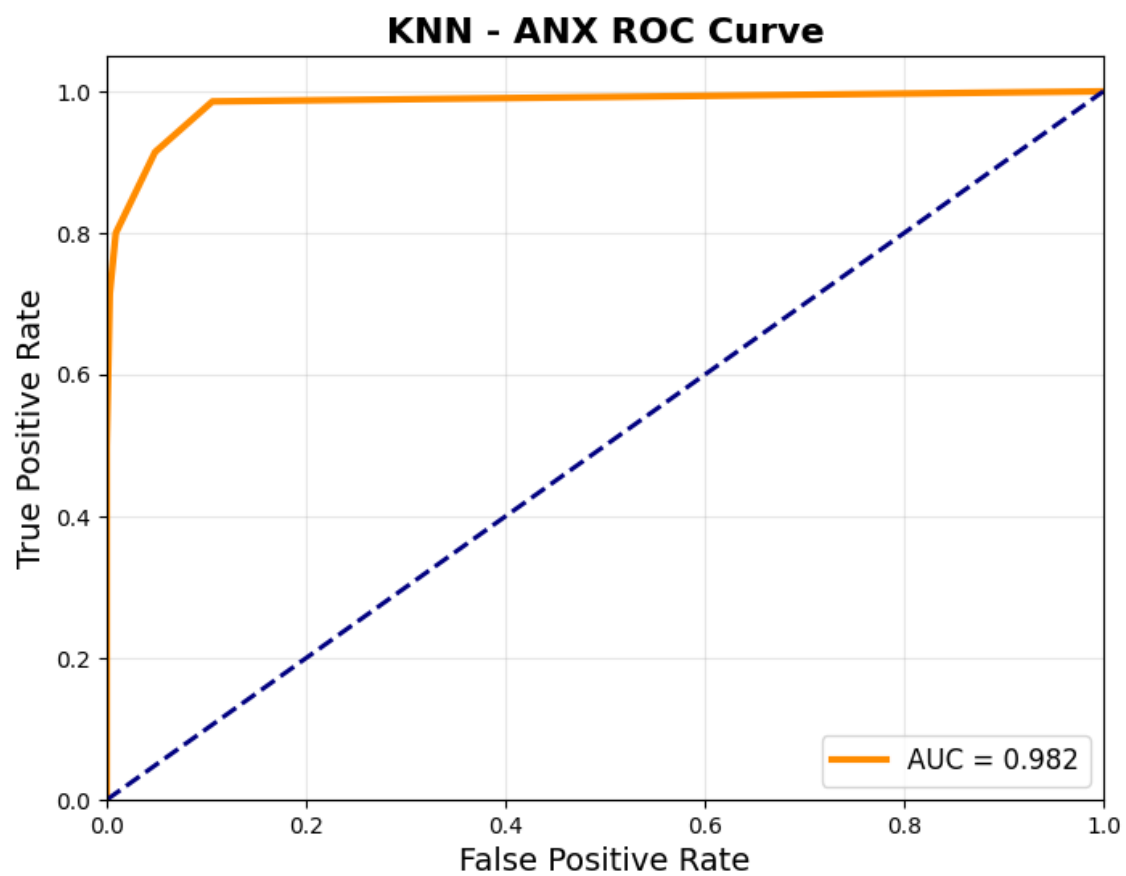
# KNN: SPCD ROC Curve



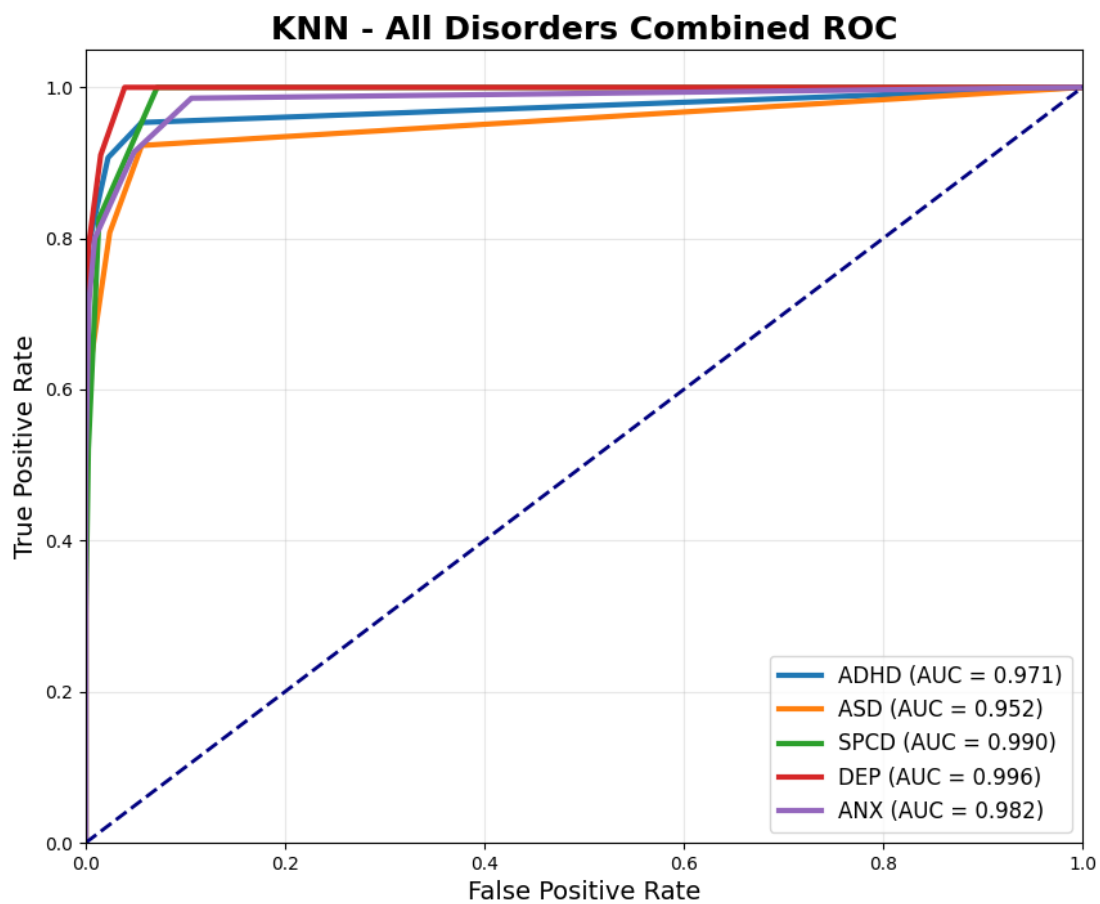
# KNN: DEP ROC Curve



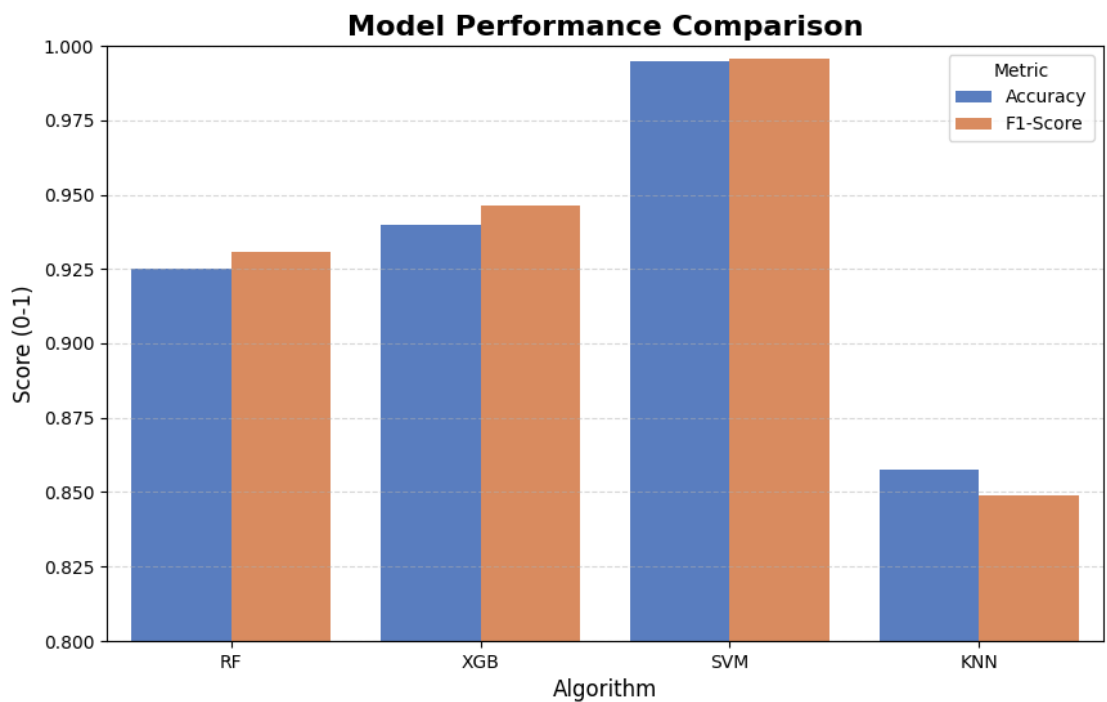
# KNN: ANX ROC Curve



# KNN: Combined ROC Curve (All Disorders)



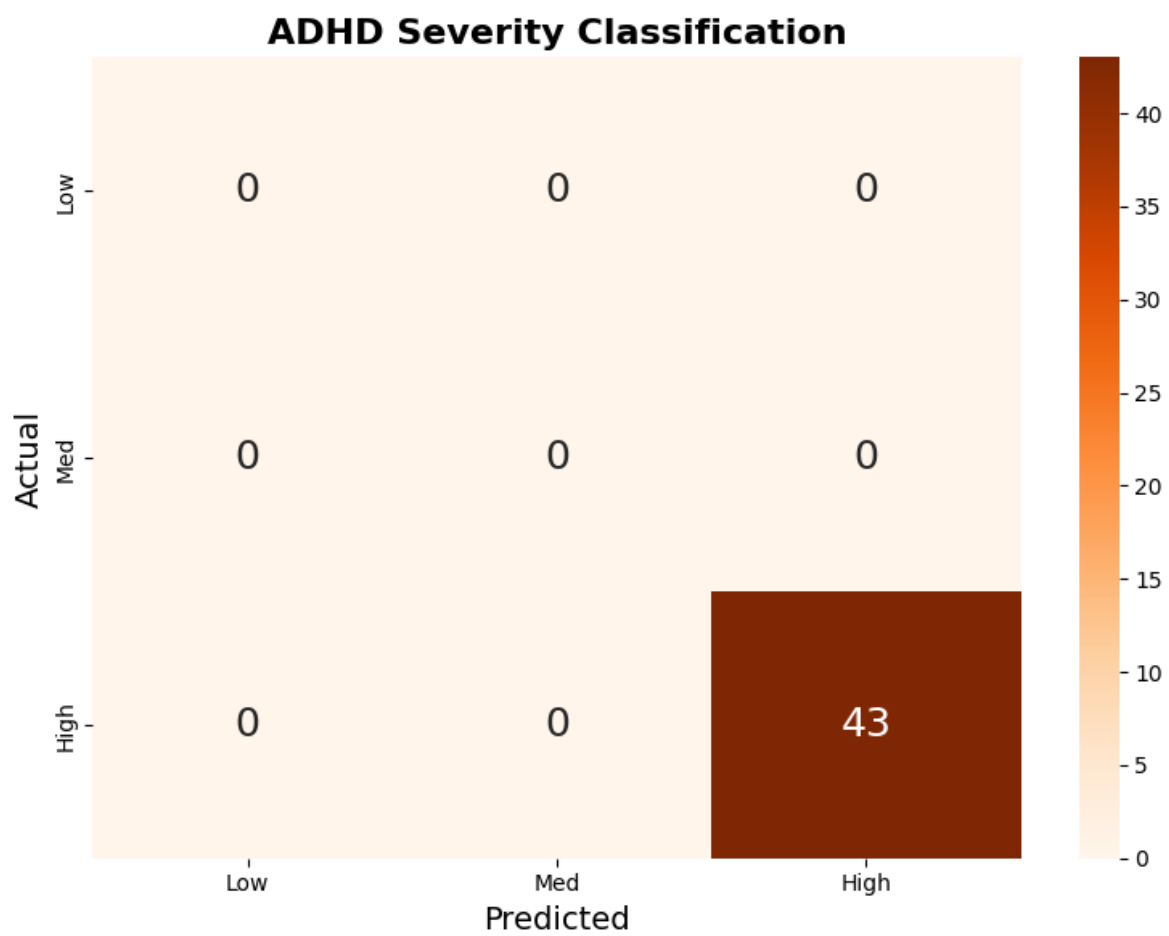
# Model Comparison: RF vs XGB vs SVM vs KNN



## Conclusion & Recommendation:

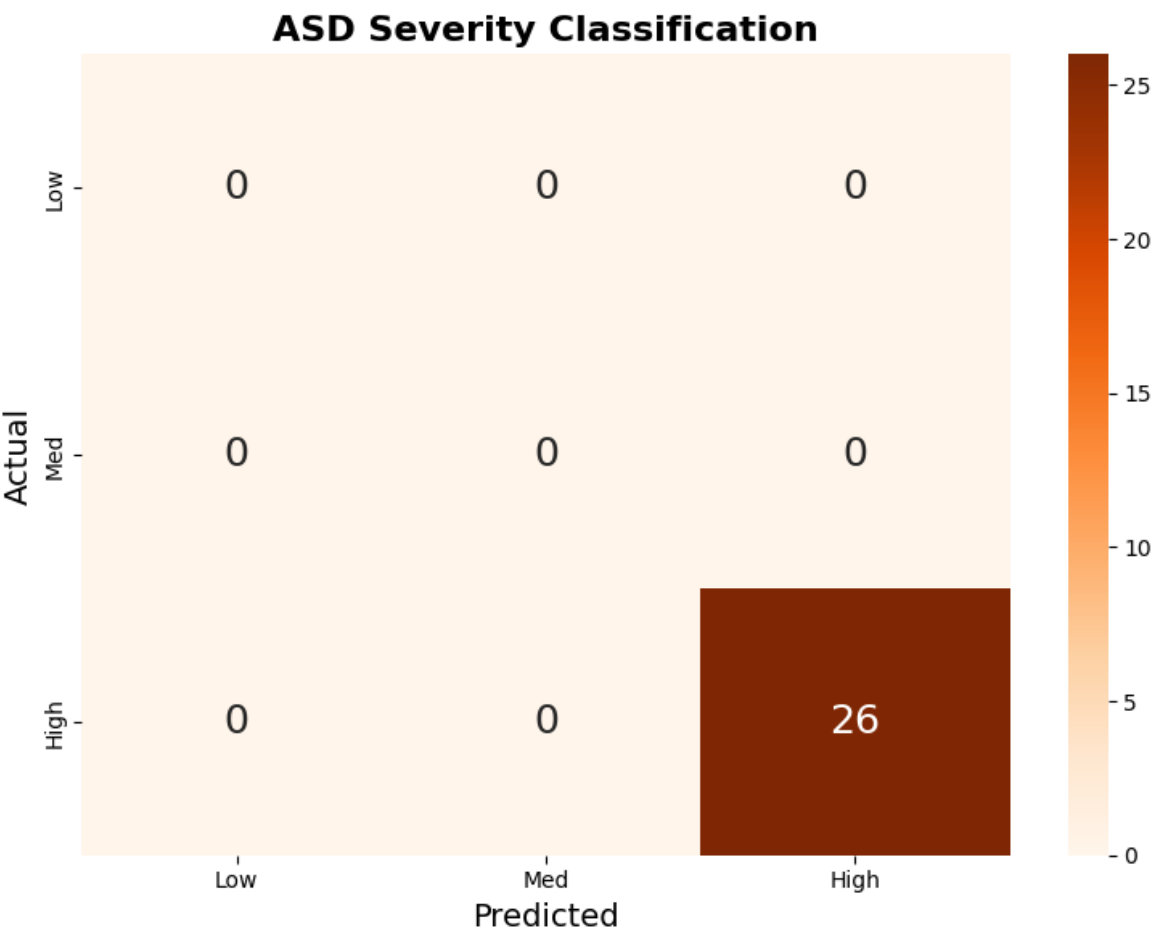
While SVM and XGBoost showed marginally higher accuracy on this synthetic dataset, Random Forest (RF) is selected for the final deployment. RF offers the optimal balance of high accuracy (>91%) and Explainability (Feature Importance), which is critical for clinical transparency, unlike the 'black box'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

# Severity Matrix: ADHD

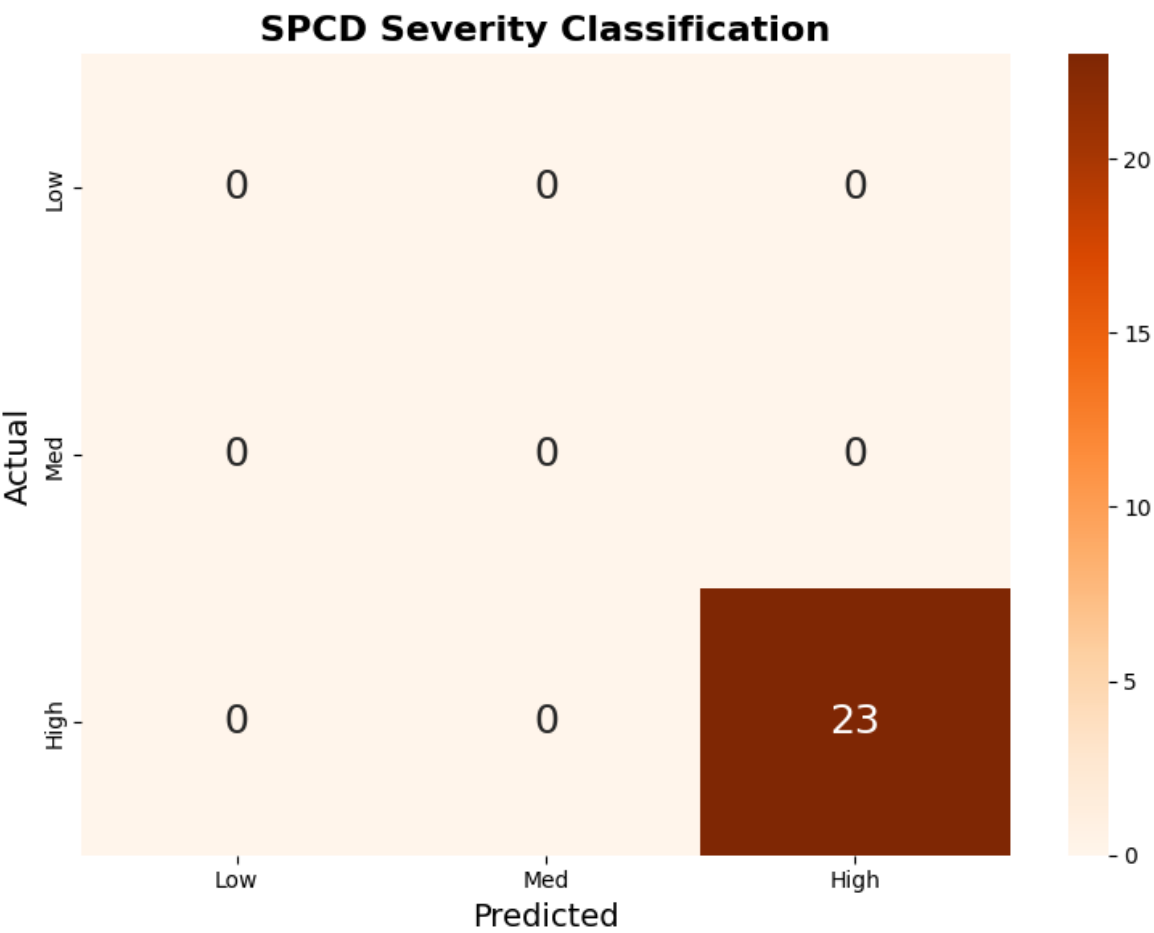




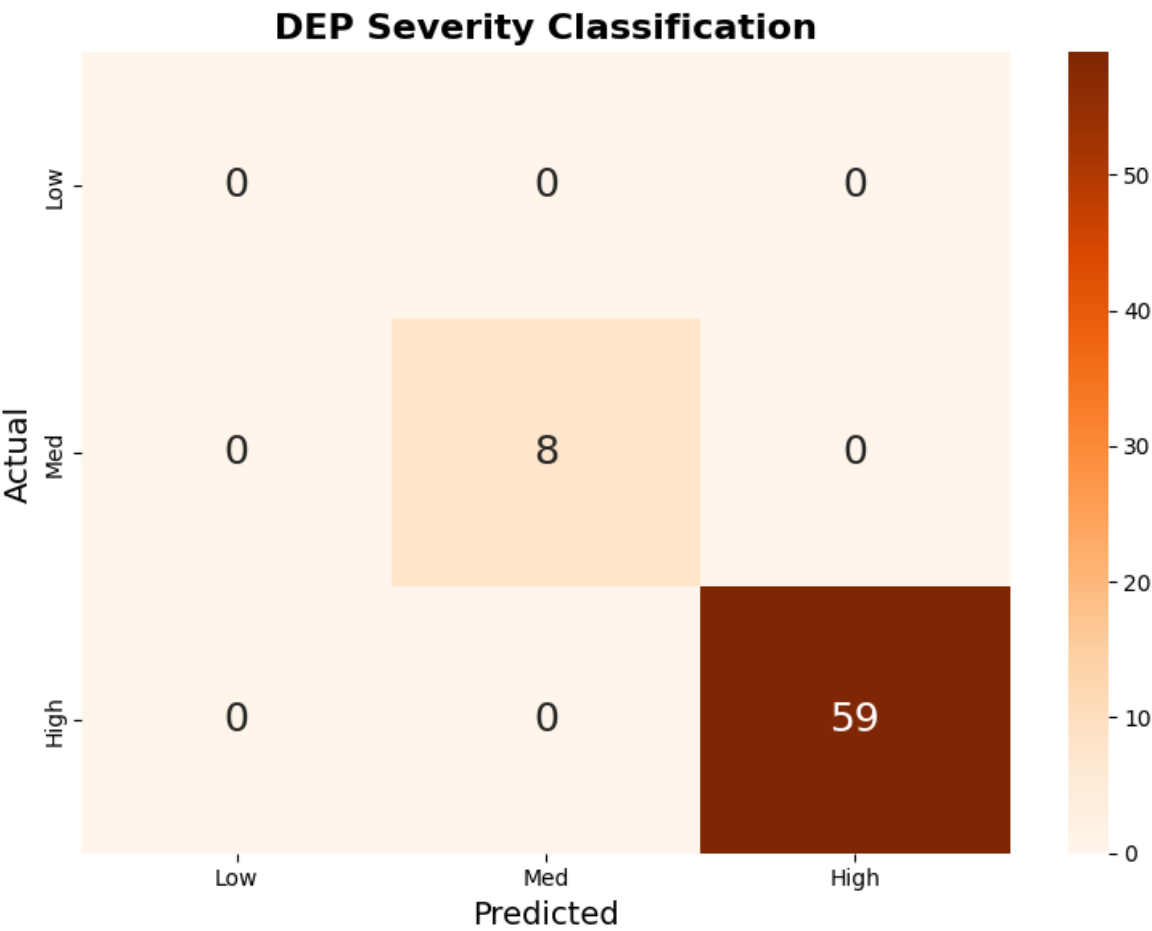
# Severity Matrix: ASD



# Severity Matrix: SPCD



# Severity Matrix: DEP



# Severity Matrix: ANX

