Analyzing The Effect of COVID-19 on Mental Health based on Bangladeshi University Students
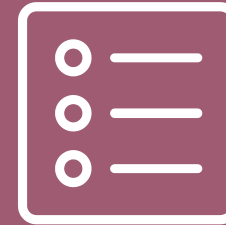
Authors

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Din Mohammad Dohan
Afsara Tasnim
Shaily Sharker
Bristy Talukder

Presentation Outline

International Conference on
Computing Advancements Analyzing The Effect of COVID-19 on Mental Health based on Bangladeshi University Students
2022

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Introduction

01	02	03	04
Introduction	**Related Studies**	**Motivation**	**Research Questions & Objectives**

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Methodology

Data Collection

Data Collection Method
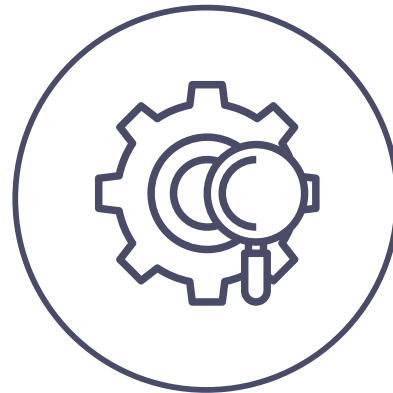
Data Cleaning and processing

Data Analysis

Data Analysis

Male
66.04%

Female
33.96%

Gender

Private university
82.08%

Public university
17.92%

University Type

Yes
94.37%

No
5.63%

Taking online Classes

No
83.65%

Yes
12.91%

Currently taking
3.44%

Diagnosed With mental Health

Yes
73.32%

No
26.68%

Affected family income
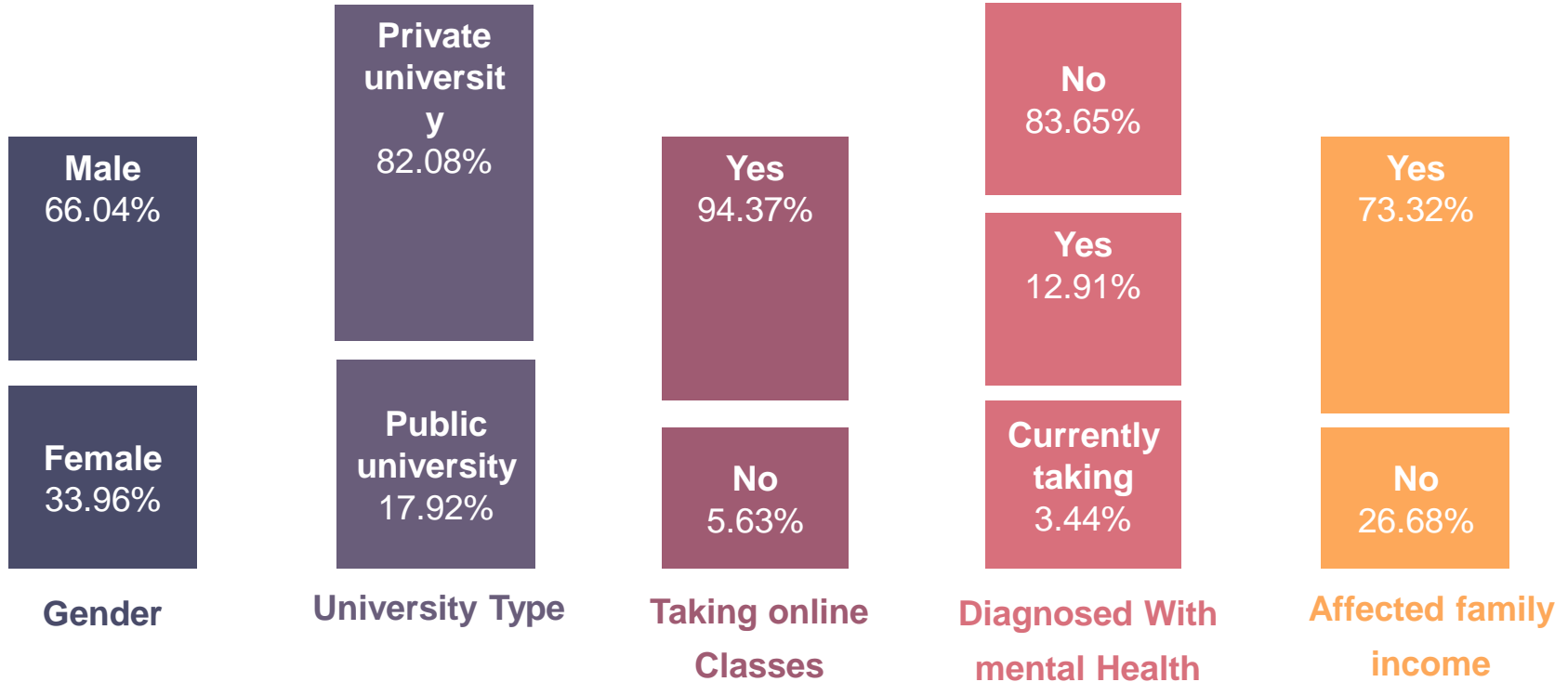
Conditions

Categories and conditions

Model	Condition	Category
Covid Anxiety Scale	cas_scale_sum > 8 cas_scale_sum <= 8	Positive Negative
Anxiety	anxiety_scale_sum < 8 8=> anxiety_scale_sum < 11 Anxiety_scale_sum > 10	Normal Borderline Abnormal Abnormal
Depression	depression_scale_sum < 8 8 => depression_scale_sum < 11 depression_scale_sum > 10	Normal Borderline Abnormal Abnormal

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Data Analysis

Cas Scale
- Negative — 63.99%
- Positive — 30.07%

Anxiety Scale
- Abnormal — 49.45%
- Normal — 37.64%
- Borderline Abnormal — 12.91%

Depression Scale
- Abnormal — 49.77%
- Normal — 39.05%
- Borderline Abnormal — 11.19%

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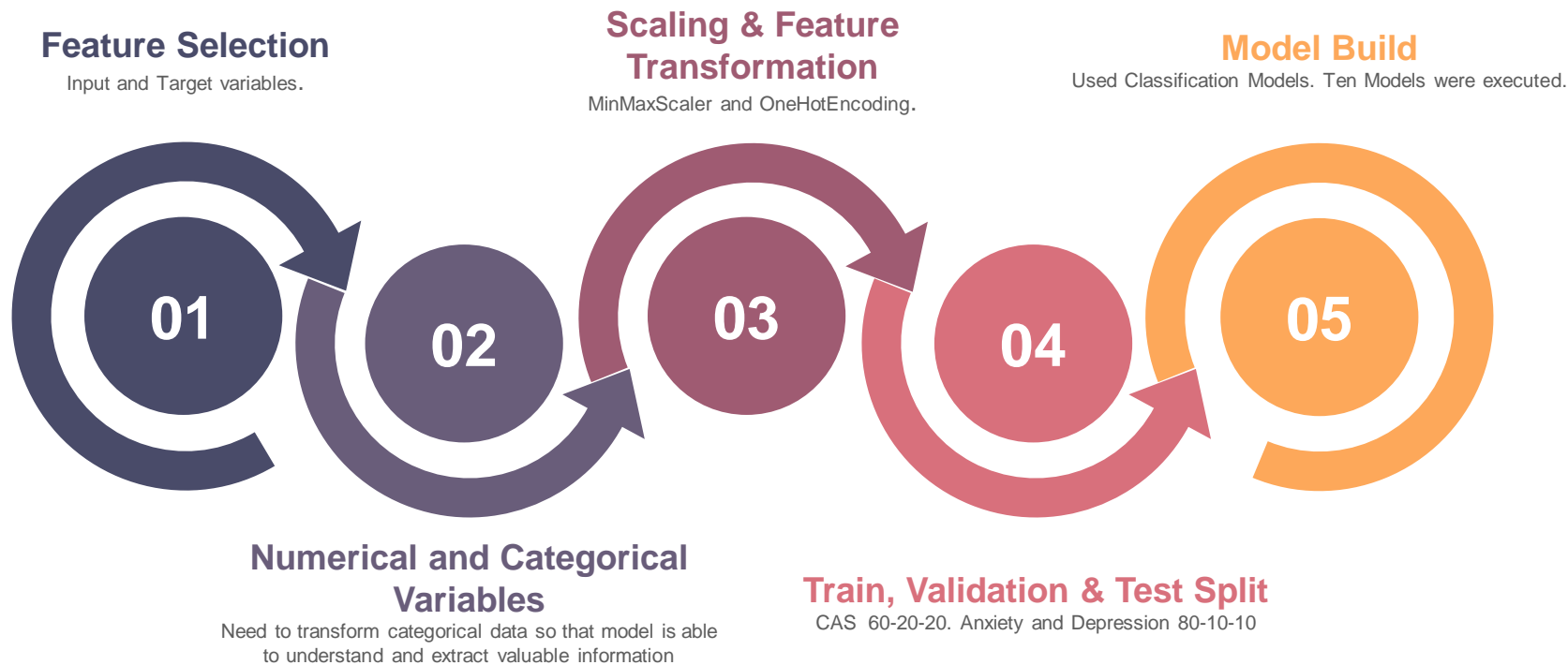
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Statistical Analysis

The Correlation between Age and the CAS, Anxiety, and Depression levels
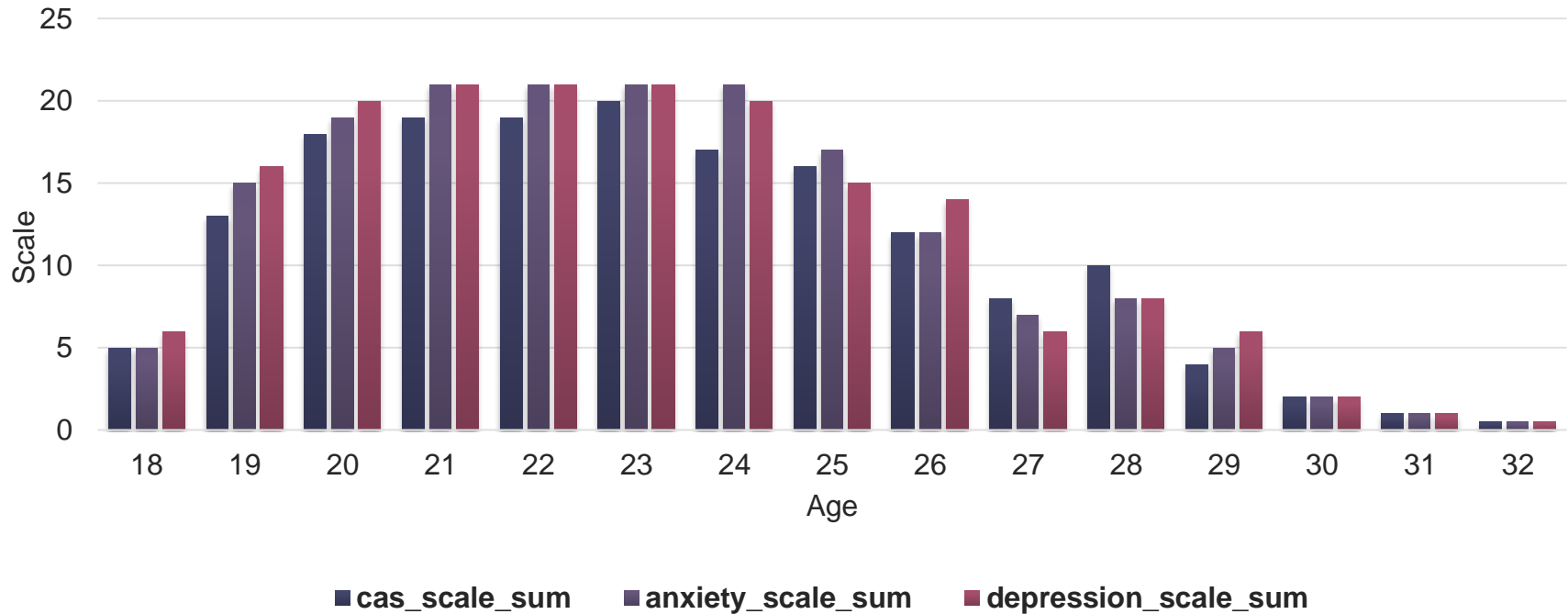
Research Process

Model Analysis

Feature Selection
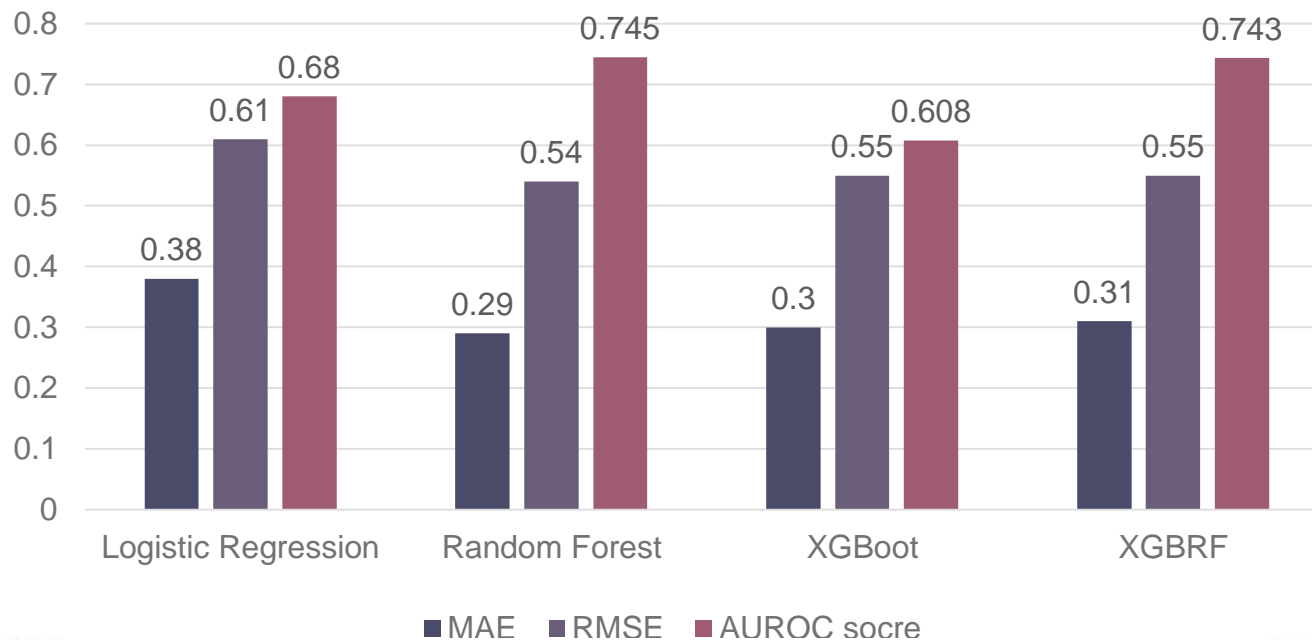Input and Target variables.

Scaling & Feature Transformation
MinMaxScaler and OneHotEncoding.

Model Build
Used Classification Models. Ten Models were executed.

01

02

03

04

05

Numerical and Categorical Variables
Need to transform categorical data so that model is able to understand and extract valuable information

Train, Validation & Test Split
CAS 60-20-20. Anxiety and Depression 80-10-10

Results

Evaluation of models performance
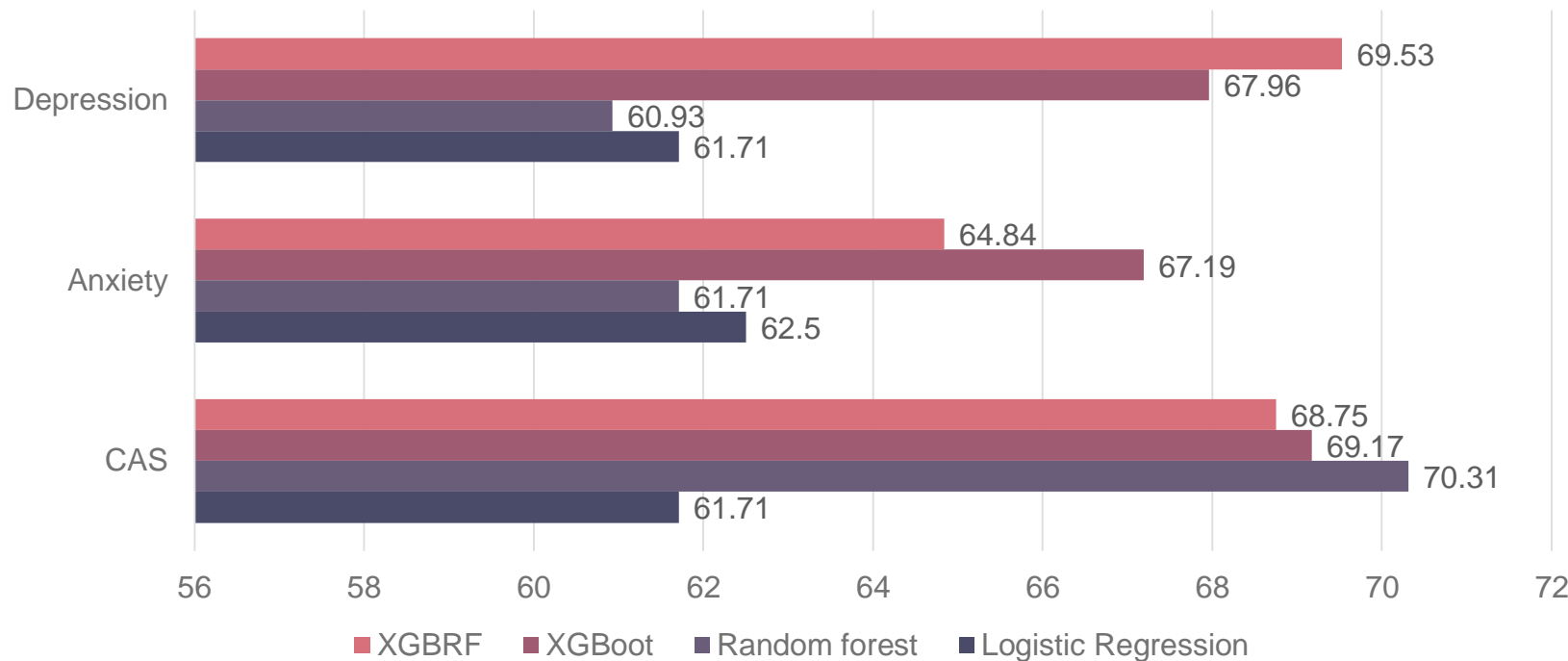
Results

Model Validation

CAS Model

Logistic Regression: MAE 0.38, RMSE 0.61, AUROC score 0.68
Random Forest: MAE 0.29, RMSE 0.54, AUROC score 0.745
XGBoot: MAE 0.3, RMSE 0.55, AUROC score 0.608
XGBRF: MAE 0.31, RMSE 0.55, AUROC score 0.743

■ MAE ■ RMSE ■ AUROC socre

Results

Model Validation

Anxiety Model

Results

Model Validation

Depression Model

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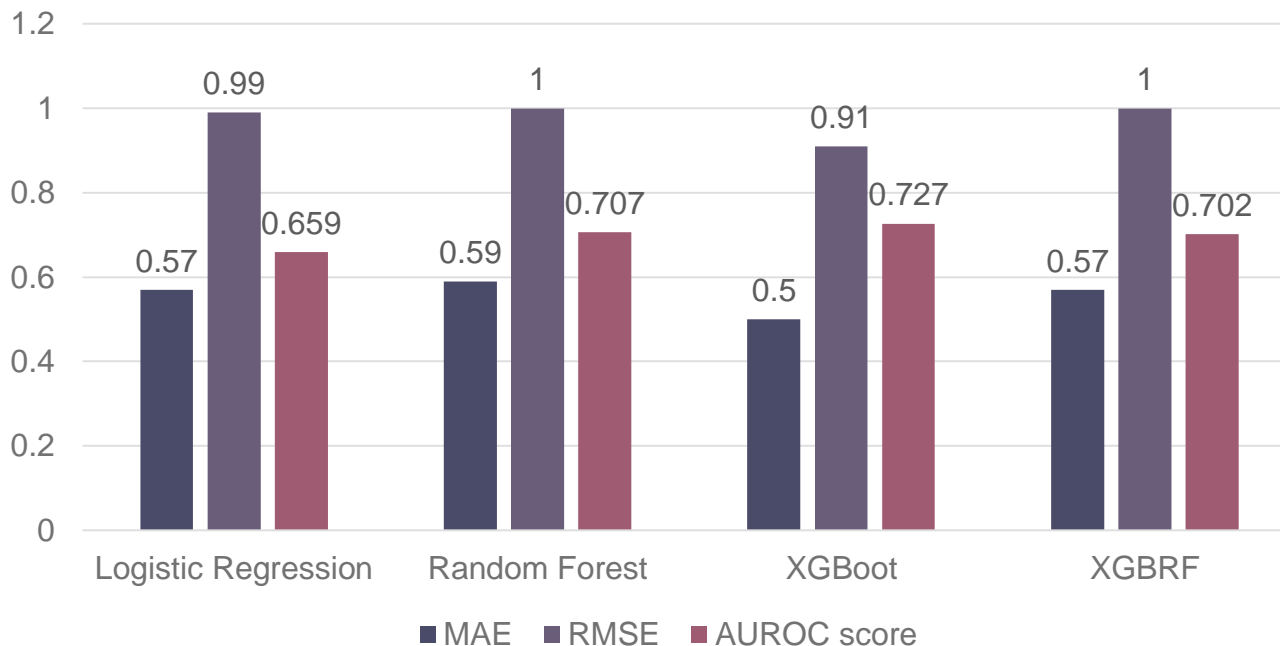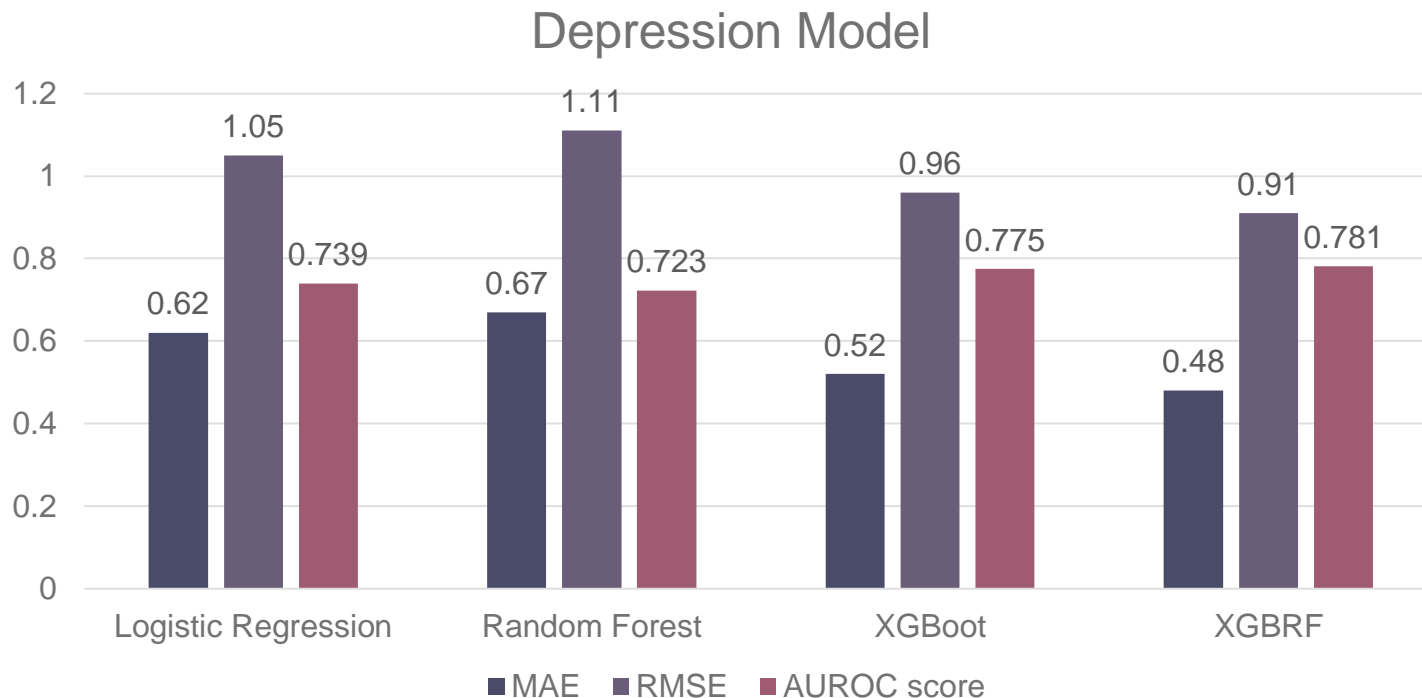
Results

Actual vs Predicted Values

CAS Model

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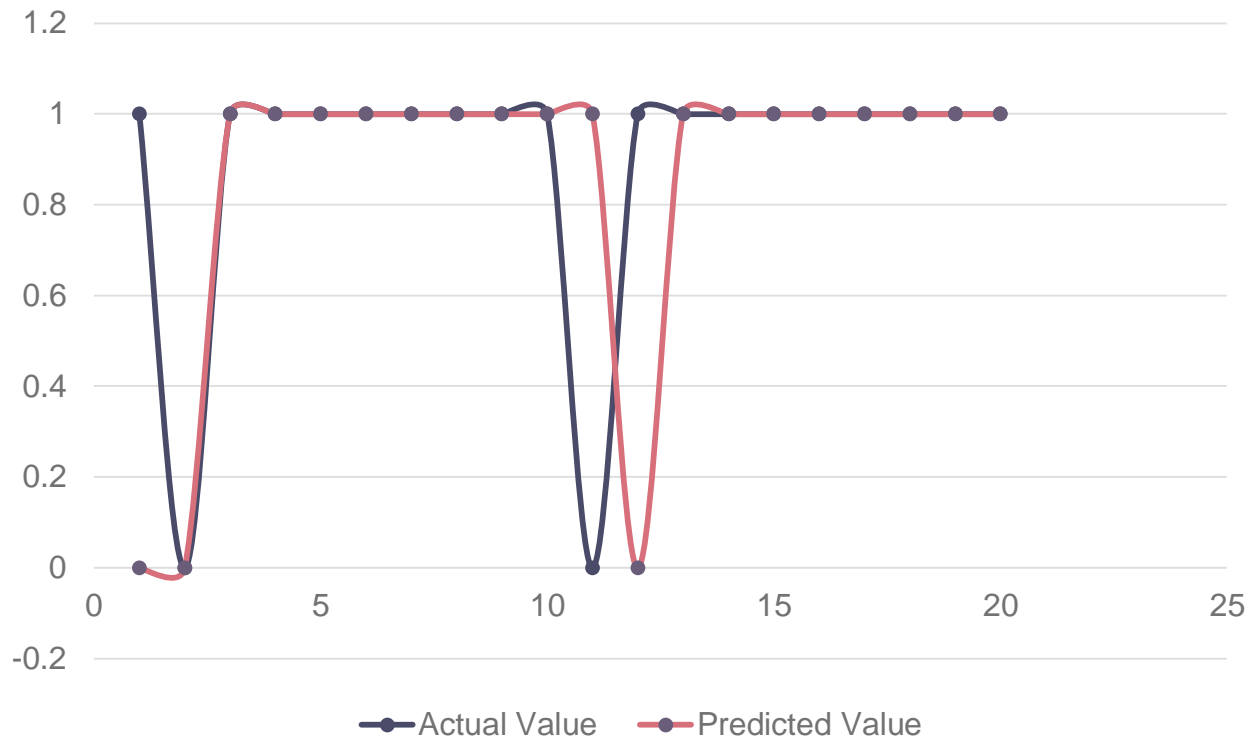
Results

Actual vs Predicted Values

Anxiety Model

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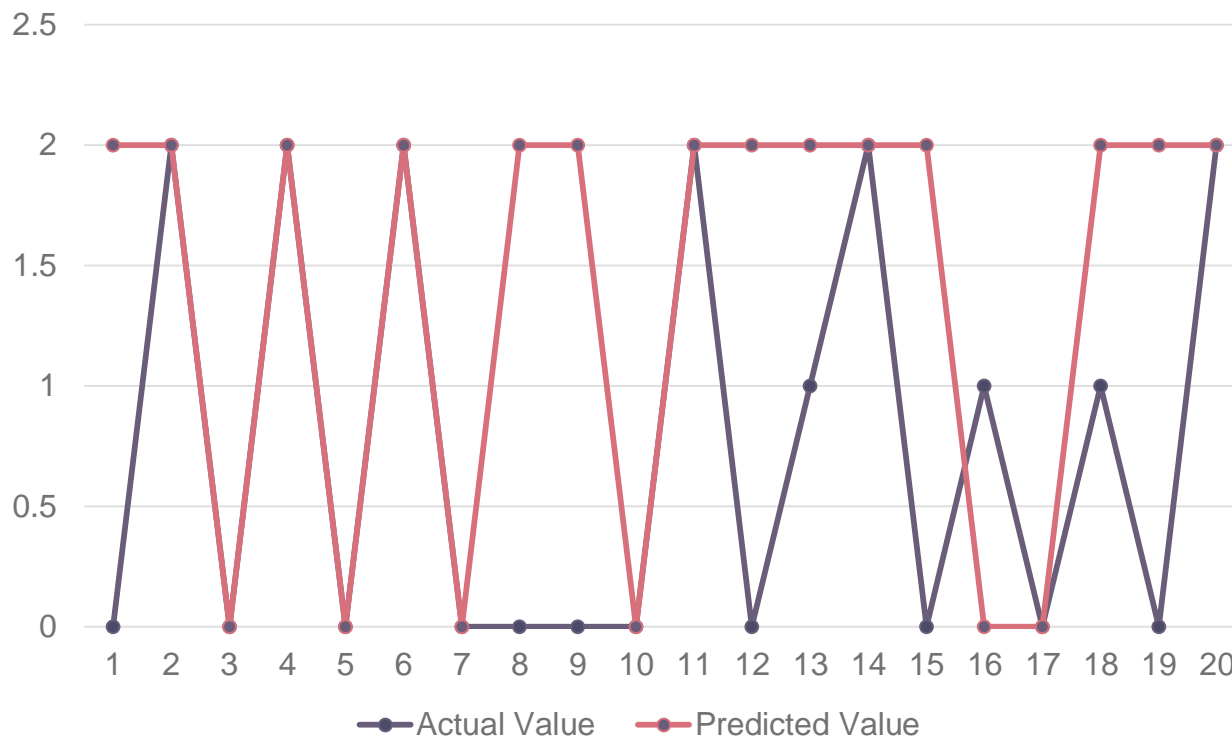
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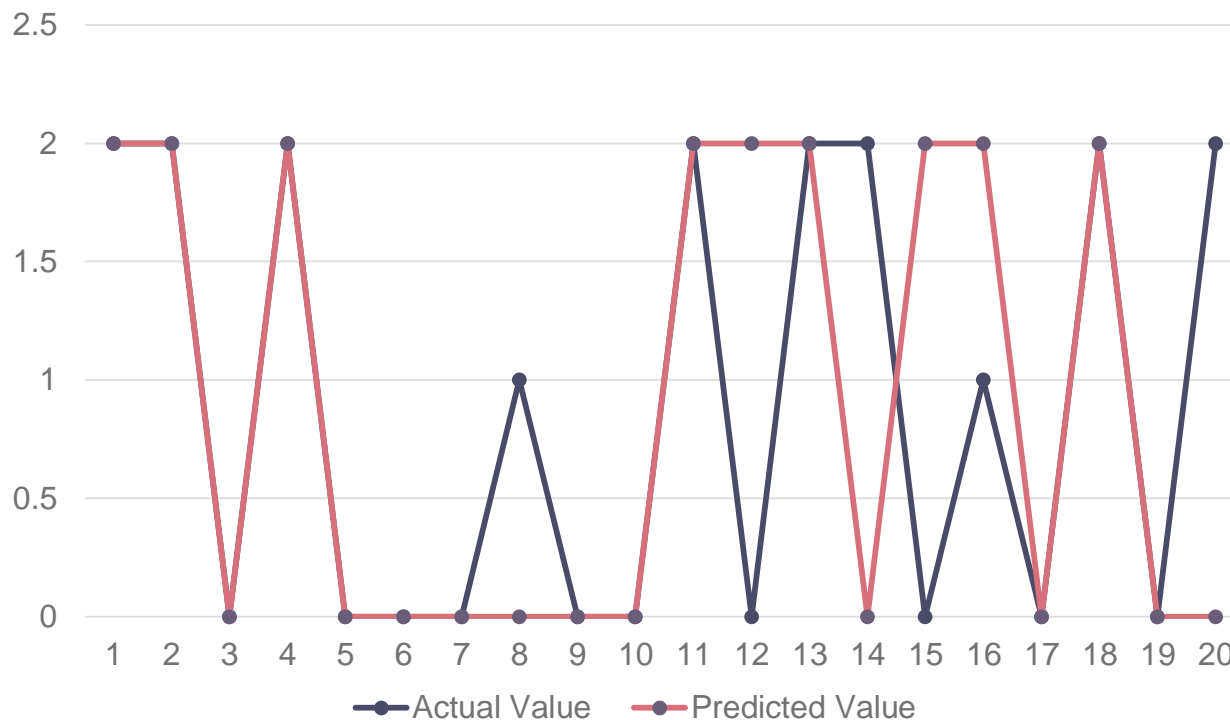
Results

Actual vs Predicted Values

Depression Model

Results

Confusion Metrix

Accuracy: 78.31%

CAS Model

Precision	Recall	F1 score
0.70	0.70	0.68

Accuracy: 67.19%
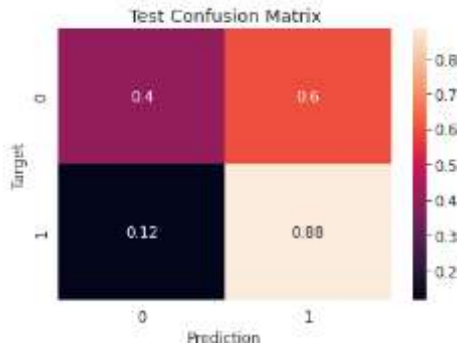
Anxiety Model

Precision	Recall	F1 score
0.60	0.67	0.63
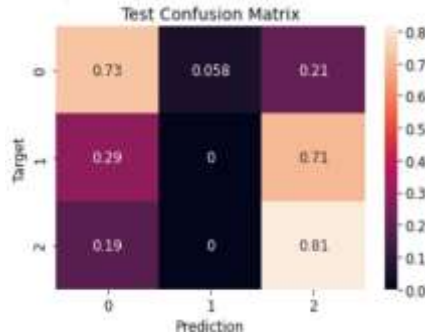
Accuracy: 69.53%
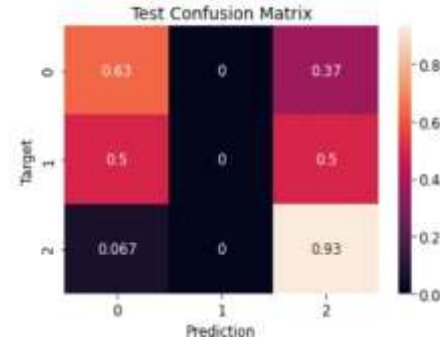
Depression Model

Precision	Recall	F1 score
0.61	0.70	0.64

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Results

Features Importance

Features Importance of CAS Model

	Importance
Living in rural areas	
Loved ones getting infected	
COVID-19 positive family	

Axis: 0, 0.02, 0.04
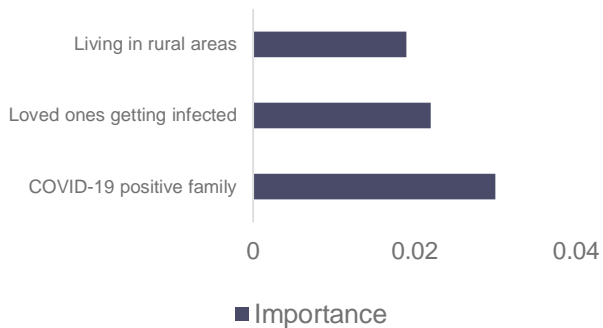
■ Importance

Features Importance of Anxiety Model

	Importance
Uncertainity of Higher studies	
Online class Difficulites	
Loved ones getting infected	
Lacking Proper Education	

Axis: 0, 0.01, 0.02, 0.03, 0.04
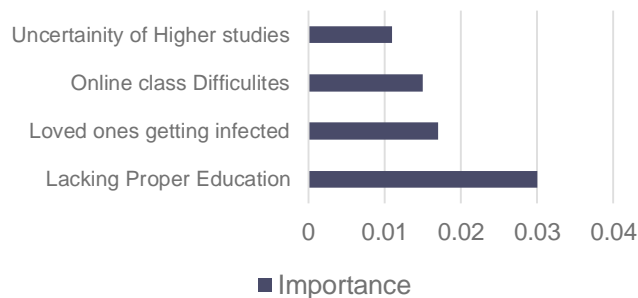
■ Importance

Features Importance of Depression Model

	Importance
COVID positive family	
Academic pressure	
Lacking Proper education	
Loved ones getting Infected	

Axis: 0, 0.02, 0.04, 0.06, 0.08, 0.1

■ Importance

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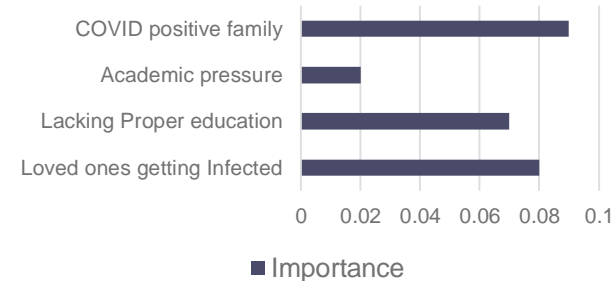
Discussion

Key Points of the Study

Psychological States

According to HADS, the psychological states reached a critical point, However anxiety level regarding COVID-19 is significantly low.

Models Performance

The CAS, Anxiety and Depression Model Performed better in Classification.

Related works similarities

Similar variables imposing significant impact on individuals psychotic states.

Models Prediction State

Higher Prediction scores recorded in Random Forest, XGBoot and XGBRF.

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Conclusions

Summary of The Study

Research Questions	**Answers of These Questions**	**Contribution of The Study**
Limitations	**Future Research**	**Recommendations**

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THANK YOU !

Q/A