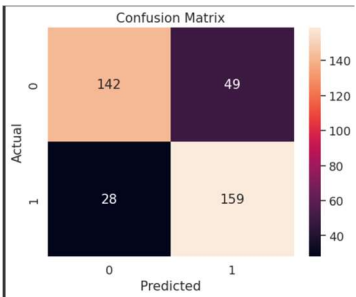


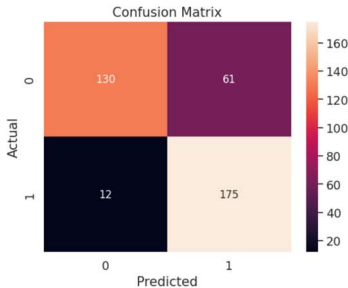
Project Development Phase Model Performance Test

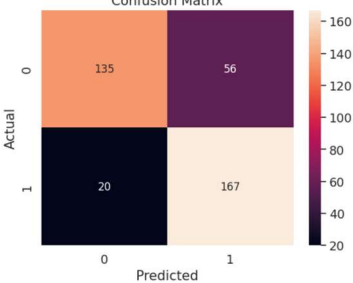
Date	09 th November 2023
Team ID	593151
Project Name	Project - Predicting Mental Health Illness Of Working Professionals Using Machine Learning
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Metrics	<p>Regression Model: MAE - , MSE - , RMSE - , R2 score -</p> <p>Classification Model: Confusion Matrix - , Accuray Score- & Classification Report -</p>	<p>Classification Model: Logistic Regression: Accuracy Score- 0.7962962962962963</p>  <p>Classification Report: Classification Accuracy: 0.7962962962962963 Classification Error: 0.20370370370370372 False Positive Rate: 0.25654450261780104 Precision: 0.7644230769230769 AUC Score: 0.7968614385306716 Crossvalidated AUC values: 0.8721058623942408 First 10 predicted responses:n [1 0 0 0 1 1 0 1 0 1]</p>

			<div>First 10 predicted probabilities of class members:n [[0.08039445 0.91960555] [0.95925545 0.04074455] [0.96155434 0.03844566] [0.76950203 0.23049797] [0.36949375 0.63050625] [0.05229329 0.94770671] [0.72663965 0.27336035] [0.28650524 0.71349476] [0.58390697 0.41609303] [0.44894488 0.55105512]]</div> <div>First 10 predicted probabilities:n [[0.91960555] [0.04074455] [0.03844566] [0.23049797] [0.63050625] [0.94770671] [0.27336035] [0.71349476] [0.41609303] [0.55105512]]</div> <div>Decision Tree: Accuracy : 0.8068783068783069</div> <div>Confusion Matrix: <table><caption>Confusion Matrix</caption><tr><th></th><th>Predicted 0</th><th>Predicted 1</th></tr><tr><th>Actual 0</th><td>130</td><td>61</td></tr><tr><th>Actual 1</th><td>12</td><td>175</td></tr></table></div> <div>Classification Report: Classification Accuracy: 0.8068783068783069 Classification Error: 0.19312169312169314 False Positive Rate: 0.3193717277486911 Precision: 0.7415254237288136</div>		Predicted 0	Predicted 1	Actual 0	130	61	Actual 1	12	175
	Predicted 0	Predicted 1										
Actual 0	130	61										
Actual 1	12	175										

			<p>AUC Score: 0.8082285746283282 Crossvalidated AUC values: 0.8841930613718008 First 10 predicted responses:n [1 0 0 0 1 1 0 1 1 1] First 10 predicted probabilities of class members:n [[0.29918033 0.70081967] [0.96969697 0.03030303] [1. 0.] [0.90517241 0.09482759] [0.29918033 0.70081967] [0.18181818 0.81818182] [0.90517241 0.09482759] [0.29918033 0.70081967] [0.22018349 0.77981651] [0.22018349 0.77981651]] First 10 predicted probabilities:n [[0.70081967] [0.03030303] [0.] [0.09482759] [0.70081967] [0.81818182] [0.09482759] [0.70081967] [0.77981651] [0.77981651]]</p> <p>Knn: Accuracy: 0.798941798941799 Confusion Matrix:</p> <p>Confusion Matrix</p>  <table><tr><td>Actual \ Predicted</td><td>0</td><td>1</td></tr><tr><td>0</td><td>135</td><td>56</td></tr><tr><td>1</td><td>20</td><td>167</td></tr></table> <p>Classification Report: Classification Accuracy: 0.798941798941799</p>	Actual \ Predicted	0	1	0	135	56	1	20	167
Actual \ Predicted	0	1										
0	135	56										
1	20	167										

			<p>Classification Error: 0.20105820105820105</p> <p>False Positive Rate: 0.2931937172774869</p> <p>Precision: 0.7488789237668162</p> <p>AUC Score: 0.7999272055323796</p> <p>Crossvalidated AUC values: 0.8653315335991026</p> <p>First 10 predicted responses:n [1 0 0 0 1 1 0 1 1 1]</p> <p>First 10 predicted probabilities of class members:n [[0.25925926 0.74074074] [1. 0.] [0.88888889 0.11111111] [0.7037037 0.2962963] [0.48148148 0.51851852] [0.2962963 0.7037037] [0.55555556 0.44444444] [0.11111111 0.88888889] [0.25925926 0.74074074] [0.33333333 0.66666667]]</p> <p>First 10 predicted probabilities:n [[0.74074074] [0.] [0.11111111] [0.2962963] [0.51851852] [0.7037037] [0.44444444] [0.88888889] [0.74074074] [0.66666667]]</p>
2.	Tune the Model	Hyperparameter Tuning - knn Validation Method – Cross Validation Score, Grid Search	

Tune the Model:

Screenshot for GridSearch:

Knn:

```

Rand. Best Score: 0.8138095238095238
Rand. Best Params: {'weights': 'uniform', 'n_neighbors': 29}
[0.808, 0.807, 0.806, 0.815, 0.806, 0.812, 0.805, 0.808, 0.815, 0.81, 0.814, 0.81, 0.815, 0.806, 0.804, 0.807, 0.812, 0.806, 0.814, 0.808]
Accuracy: 0.798941798941799
Null accuracy:n 0 191
1 187
Name: treatment, dtype: int64
Percentage of ones: 0.4947089947089947
Percentage of zeros: 0.5052910052910053
True: [0 0 0 0 0 0 0 1 1 0 1 1 0 1 1 0 1 0 0 0 1 1 0 0]
Pred: [1 0 0 0 1 1 0 1 1 1 0 1 1 1 1 1 1 1 0 0 0 1 0 0]
```

Tree Classifier:

```

Rand. Best Score: 0.8305206349206349
Rand. Best Params: {'criterion': 'entropy', 'max_depth': 3, 'max_features': 6, 'min_samples_leaf': 7, 'min_samples_split': 8}
[0.824, 0.831, 0.829, 0.829, 0.819, 0.831, 0.831, 0.831, 0.831, 0.831, 0.831, 0.83, 0.831, 0.831, 0.831, 0.829, 0.797, 0.803, 0.819, 0.831]
[1 0 0 0 1 1 0 1 1 1 0 1 1 0 1 1 1 1 0 0 0 0 1 0 0 1 0 0 1 1 1 1 0 1 1 0 1
 1 1 0 0 0 1 0 1 1 1 1 1 1 1 0 1 1 0 1 0 0 1 1 1 1 1 0 0 1 1 0 1 1 1 1 0 0
 0 1 1 1 0 0 1 1 0 1 0 1 1 1 1 0 1 0 1 1 1 1 1 0 1 1 1 1 0 1 1 0 1 1 0 0 0
 1 1 0 1 0 1 1 1 1 0 1 1 1 0 0 1 1 1 1 0 0 0 0 1 1 1 1 0 1 0 0 1 0 1 1 1 1
 0 0 0 1 1 1 1 0 0 1 1 0 1 1 0 1 1 1 1 1 1 0 1 0 0 1 1 0 1 0 1 1 1 0 0 1
 1 1 0 0 1 1 0 1 1 0 1 1 0 1 0 0 1 0 1 0 0 0 1 1 0 1 1 1 1 0 0 0 1 1 1 0
 1 1 1 0 1 1 0 1 1 1 1 0 1 1 1 1 0 1 0 1 1 1 0 1 0 1 1 0 1 0 1 1 1 1 0 1
 1 0 1 1 1 0 1 1 1 0 1 1 1 1 0 1 0 1 0 1 1 1 1 0 0 0 1 1 1 0 1 0 1 0 0 1
 0 1 0 0 0 1 1 1 0 0 0 0 1 0 1 1 1 0 0 0 1 0 1 0 0 1 1 0 1 0 0 1 1 1 1 0
 1 0 1 0 1 1 0 1 1 0 0 1 1 1 1 1 1 1 1 0 1 1 1 1 0 1 1 1 0 1 1 1 0 1 0 0
 0 1 1 1 0 1 0 1]
Accuracy: 0.8068783068783069
Null accuracy:n 0 191
1 187
Name: treatment, dtype: int64
Percentage of ones: 0.4947089947089947
Percentage of zeros: 0.5052910052910053
True: [0 0 0 0 0 0 0 1 1 0 1 1 0 1 1 0 1 0 0 0 1 1 0 0]
Pred: [1 0 0 0 1 1 0 1 1 1 0 1 1 0 1 1 1 1 0 0 0 0 1 0 0]
```