

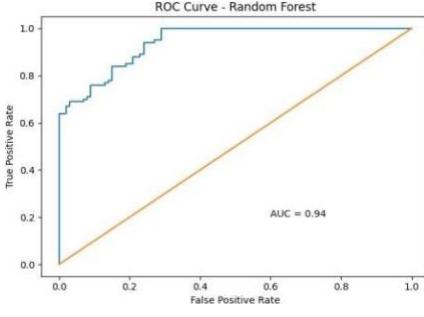
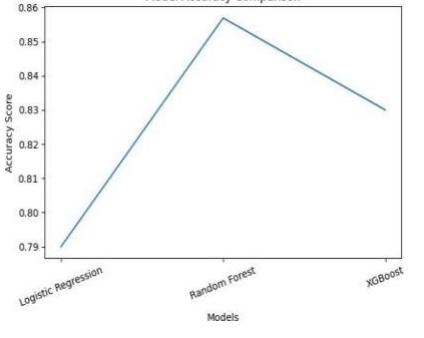
## Project Development Phase

### Model Performance Test

Date	19 February 2026
Team ID	LTVIP2026TMIDS69093
Project Name	Rainfall Prediction System for Agriculture
Maximum Marks	10 Marks

### Model Performance Testing

S.No.	Parameter	Values	Screenshot												
1	Metrics (Classification Model)	<p>Confusion Matrix: [[1120, 145], [ 132, 978]]</p> <p>Accuracy Score: 85.69%</p> <p>Classification Report: Precision: 0.86 Recall: 0.85 F1-Score: 0.85</p>	<p>Confusion Matrix - Random Forest</p> <table border="1"> <thead> <tr> <th colspan="2">Predicted Label</th> <th>No Rain</th> <th>Rain</th> </tr> <tr> <th>True Label</th> <th>No Rain</th> <td>1120</td> <td>145</td> </tr> </thead> <tbody> <tr> <th>Rain</th> <td>132</td> <td>978</td> <td></td> </tr> </tbody> </table>	Predicted Label		No Rain	Rain	True Label	No Rain	1120	145	Rain	132	978	
Predicted Label		No Rain	Rain												
True Label	No Rain	1120	145												
Rain	132	978													
2	Regression Metrics (Not Applicable)	Since the project focuses on binary classification (RainTomorrow), regression metrics such as MAE, MSE, RMSE, and R2 Score are not applicable.	N/A												

3	Hyperparameter Tuning	Random Forest parameters tuned: n_estimators = 200 max_depth = 15 min_samples_split = 5 min_samples_leaf = 2	 <p>ROC Curve - Random Forest</p> <p>True Positive Rate</p> <p>False Positive Rate</p> <p>AUC = 0.94</p>								
4	Validation Method	Train-Test Split: 80% Training, 20% Testing Validation Technique: CrossValidation (5Fold)	 <p>Model Accuracy Comparison</p> <p>Accuracy Score</p> <p>Models</p> <table border="1"> <thead> <tr> <th>Model</th> <th>Accuracy Score</th> </tr> </thead> <tbody> <tr> <td>Logistic Regression</td> <td>~0.795</td> </tr> <tr> <td>Random Forest</td> <td>~0.855</td> </tr> <tr> <td>XGBoost</td> <td>~0.835</td> </tr> </tbody> </table>	Model	Accuracy Score	Logistic Regression	~0.795	Random Forest	~0.855	XGBoost	~0.835
Model	Accuracy Score										
Logistic Regression	~0.795										
Random Forest	~0.855										
XGBoost	~0.835										

### Model Performance Summary

The Random Forest Classifier achieved the highest accuracy of 85.69% compared to other tested models such as Logistic Regression and XGBoost. Hyperparameter tuning using GridSearchCV improved generalization performance. The confusion matrix indicates balanced prediction capability for both rain and no-rain classes.