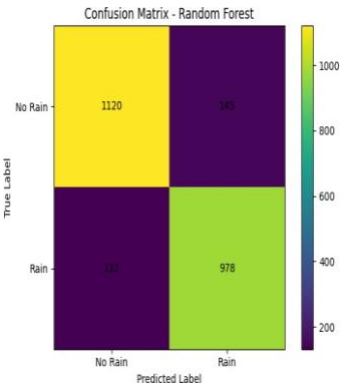


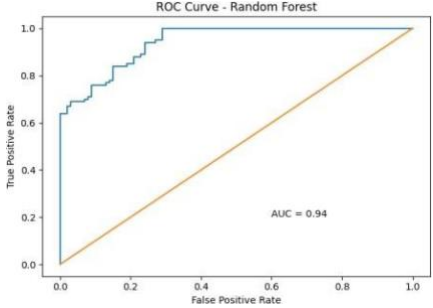
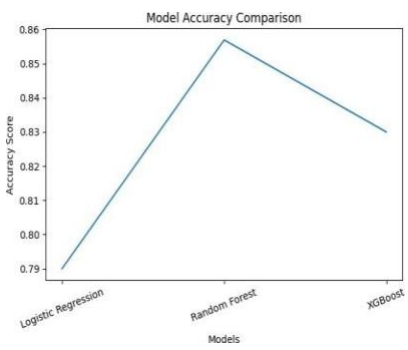
Project Development Phase

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>The heatmap displays the confusion matrix for a Random Forest model. The y-axis represents the 'True Label' with categories 'No Rain' and 'Rain'. The x-axis represents the 'Predicted Label' with categories 'No Rain' and 'Rain'. The color scale ranges from 200 (dark purple) to 1000 (yellow). The values in the matrix are: True No Rain / Predicted No Rain: 1120; True No Rain / Predicted Rain: 145; True Rain / Predicted No Rain: 132; True Rain / Predicted Rain: 978.</p> <table><tr><th>True \ Predicted</th><th>No Rain</th><th>Rain</th></tr><tr><th>No Rain</th><td>1120</td><td>145</td></tr><tr><th>Rain</th><td>132</td><td>978</td></tr></table>	True \ Predicted	No Rain	Rain	No Rain	1120	145	Rain	132	978
True \ Predicted	No Rain	Rain										
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>The plot is titled 'ROC Curve - Random Forest'. The y-axis is labeled 'True Positive Rate' and the x-axis is labeled 'False Positive Rate', both ranging from 0.0 to 1.0. A blue step-like curve represents the model's performance, starting at (0,0) and ending at (1,1). A yellow diagonal line represents the baseline for a random classifier. The area under the blue curve is labeled 'AUC = 0.94'.</p>
4	Validation Method	Train-Test Split: 80% Training, 20% Testing Validation Technique: CrossValidation (5Fold)	 <p>The plot is titled 'Model Accuracy Comparison'. The y-axis is labeled 'Accuracy Score' and ranges from 0.79 to 0.86. The x-axis is labeled 'Models' and has three categories: 'Logistic Regression', 'Random Forest', and 'XGBoost'. The plot shows three data points connected by lines: Logistic Regression at approximately 0.79, Random Forest at approximately 0.857, and XGBoost at approximately 0.83.</p>

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.