

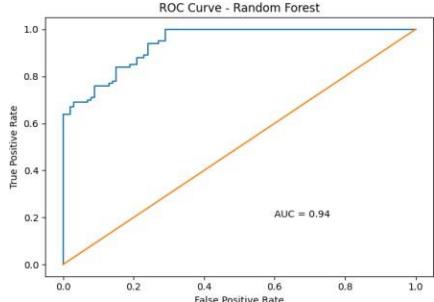
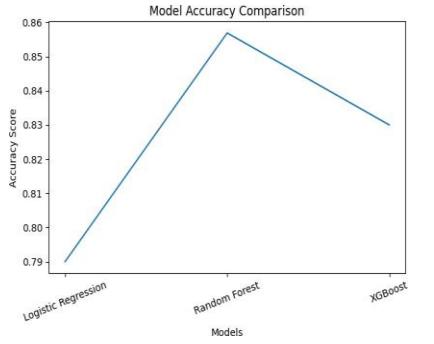
Project Development Phase

Model Performance Test

Date	15 February 2026
Team ID	PNT2022TMIDS73971
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: Cross-Validation (5-Fold)	 <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>~0.857</td> </tr> <tr> <td>XGBoost</td> <td>~0.832</td> </tr> </tbody> </table>	Model	Accuracy Score	Logistic Regression	~0.795	Random Forest	~0.857	XGBoost	~0.832
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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.