

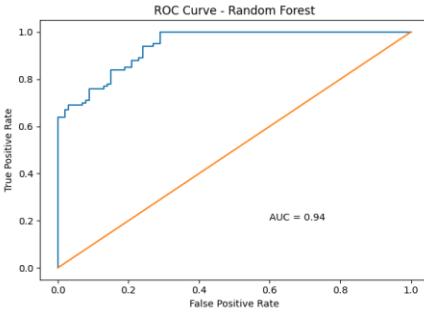
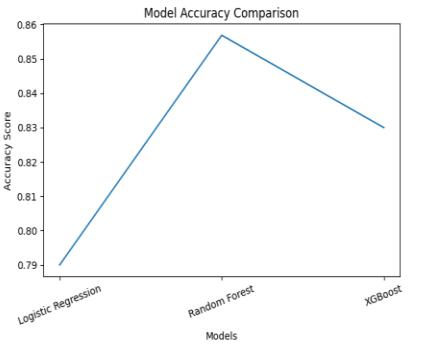
## Project Development Phase

### Model Performance Test

Date	15 February 2026
Team ID	PNT2022TMIDS75281
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" rowspan="2">True Label</th> <th colspan="2">Predicted Label</th> </tr> <tr> <th>No Rain</th> <th>Rain</th> </tr> </thead> <tbody> <tr> <th rowspan="2">No Rain</th> <td>1120</td> <td>145</td> </tr> <tr> <td>132</td> <td>978</td> </tr> </tbody> </table>	True Label		Predicted Label		No Rain	Rain	No Rain	1120	145	132	978
True Label		Predicted Label												
		No Rain	Rain											
No Rain	1120	145												
	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	
4	Validation Method	Train-Test Split: 80% Training, 20% Testing Validation Technique: Cross-Validation (5-Fold)	

## 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.