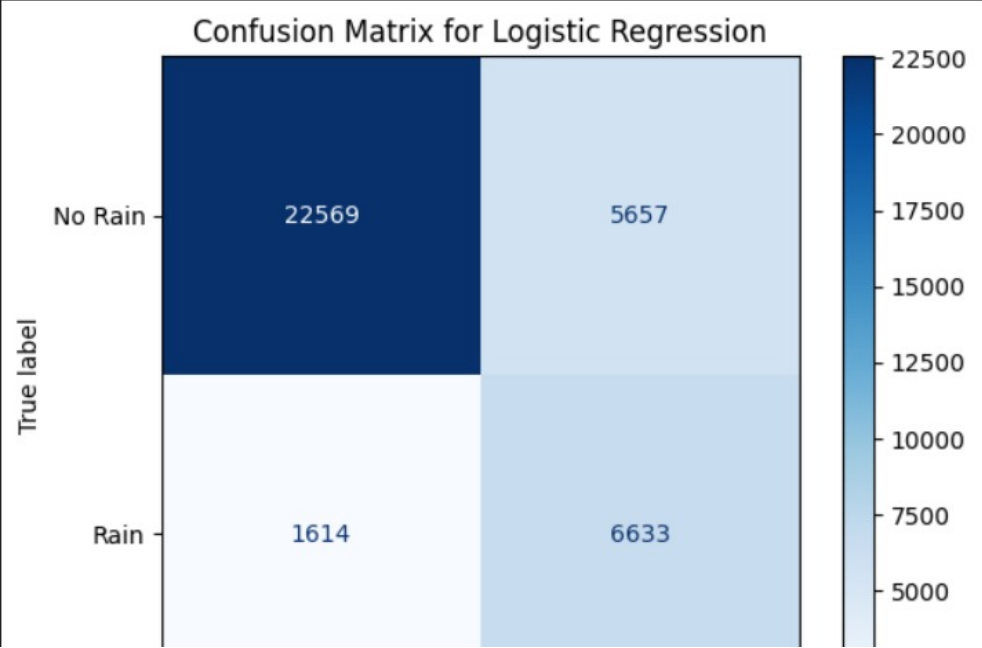```
--- Training Logistic Regression ---
--- Logistic Regression Evaluation on Test Data ---
ROC AUC Score: 0.8807

Classification Report:
              precision   recall f1-score   support

         0.0   0.93   0.80   0.86   28226
         1.0   0.54   0.80   0.65   8247

    accuracy   0.80   36473
   macro avg   0.74   0.80   0.75   36473
weighted avg   0.84   0.80   0.81   36473
```
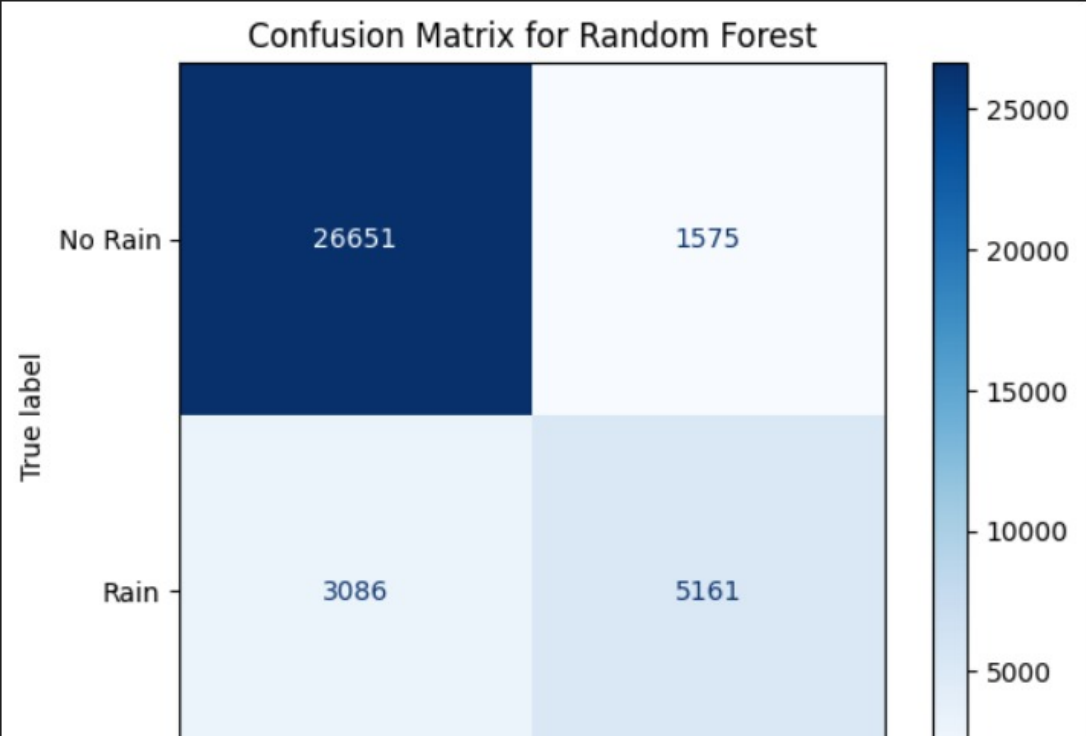

Confusion Matrix for Logistic Regression

```
--- Training Random Forest ---
--- Random Forest Evaluation on Test Data ---
ROC AUC Score: 0.9157

Classification Report:
              precision   recall f1-score   support

         0.0   0.90   0.94   0.92   28226
         1.0   0.77   0.63   0.69   8247

    accuracy   0.87   36473
   macro avg   0.83   0.79   0.80   36473
weighted avg   0.87   0.87   0.87   36473
```
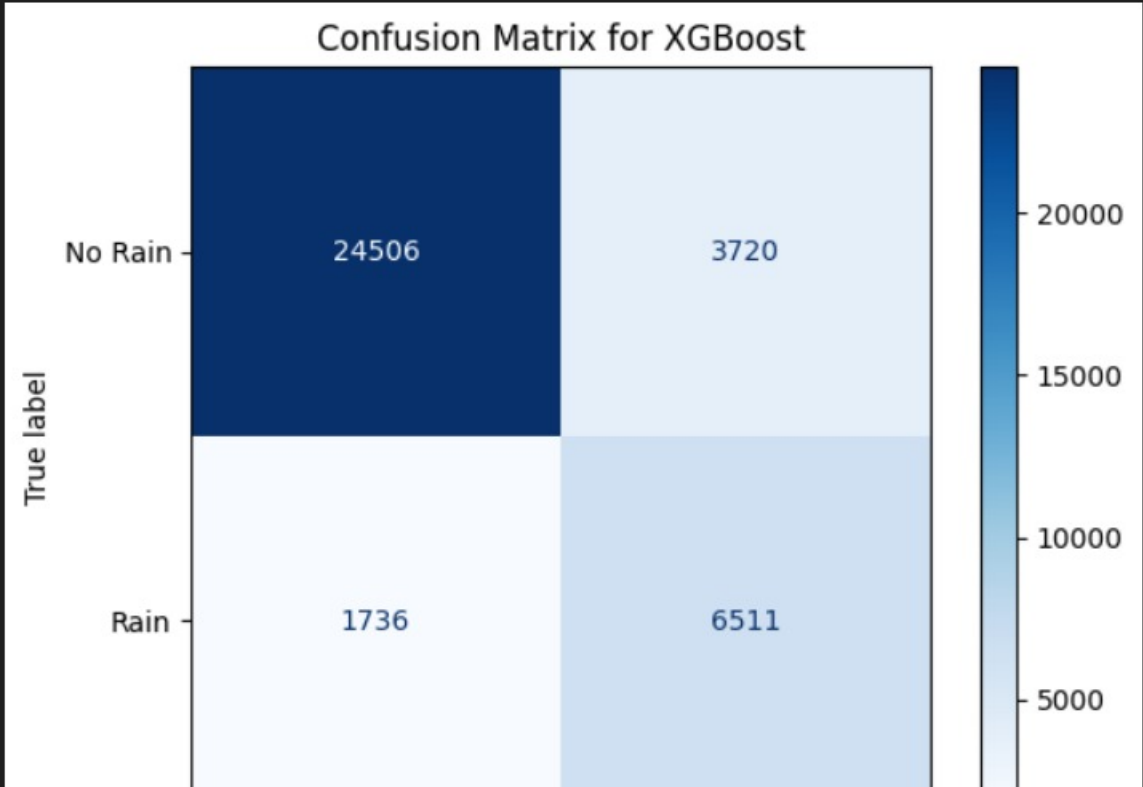
## Confusion Matrix for Random Forest

| True label | | |
|---|---|---|
| No Rain | 26651 | 1575 |
| Rain | 3086 | 5161 |

```
--- Training XGBoost ---
--- XGBoost Evaluation on Test Data ---
ROC AUC Score: 0.9144

Classification Report:
              precision    recall  f1-score   support

         0.0       0.93      0.87      0.90     28226
         1.0       0.64      0.79      0.70      8247

    accuracy                           0.85     36473
   macro avg       0.79      0.83      0.80     36473
weighted avg       0.87      0.85      0.86     36473
```


Confusion Matrix for XGBoost

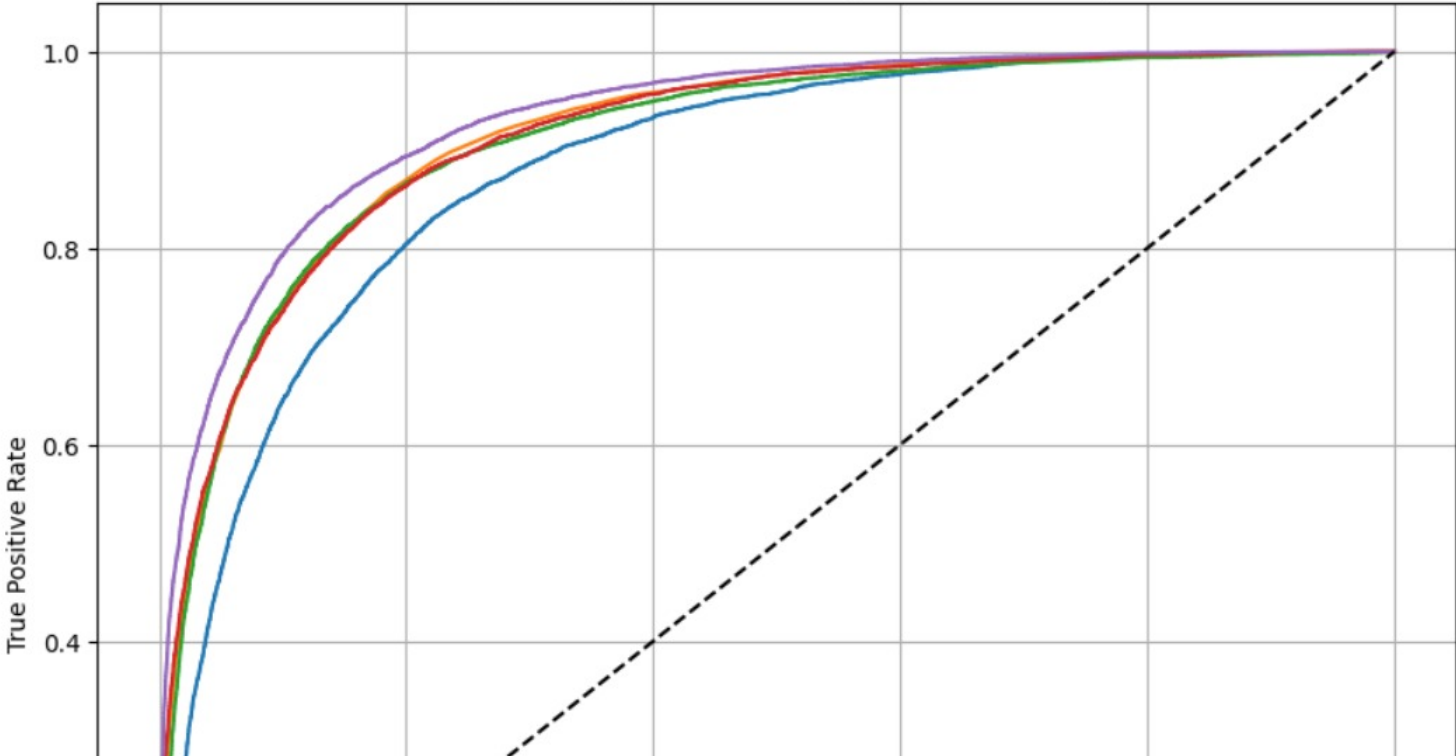```
--- Step 5: Final Model Comparison Summary ---
              Model   ROC_AUC Precision_1 Recall_1 F1-Score_1
4   Neural Network   0.931655   0.0   0.0   0.0
1   Random Forest   0.915696   0.0   0.0   0.0
3   XGBoost   0.914377   0.0   0.0   0.0
2   MLP Classifier   0.909999   0.0   0.0   0.0
0 Logistic Regression 0.880681   0.0   0.0   0.0
1140/1140 ─────────────────── 1s 505us/step
```

Receiver Operating Characteristic (ROC) Curve Comparison

```
..
    --- Final Conclusion ---
    Based on ROC AUC and F1-Score for the minority class, the best performing model is likely: Neural Network
```