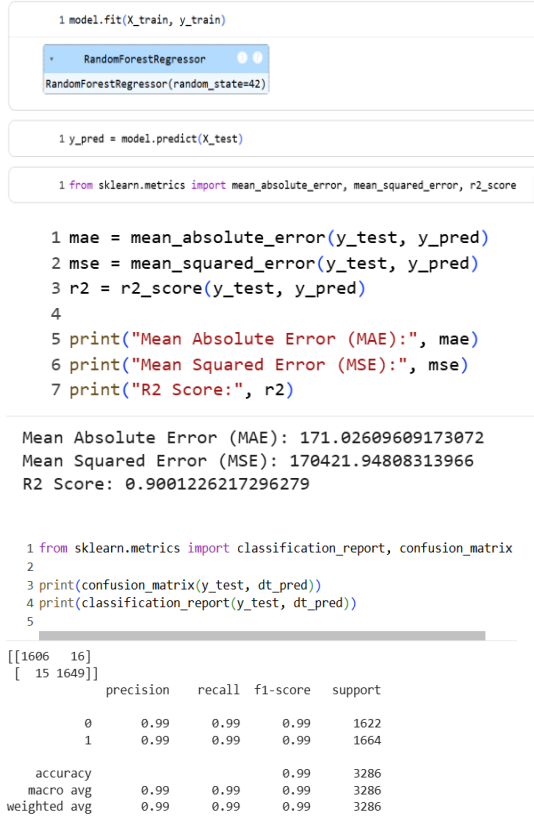


## Project Development Phase Model Performance Test

|               |   |
|---------------|---|
| Date          | 15 February 2026  |
| Team ID       | LTVIP2026TMIDS62246   |
| Project Name  | Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management |
| Maximum Marks | 10 marks  |

### Model Performance Testing – Wind Turbine Energy Prediction

| S.No. | Parameter | Values  | Screenshot  |
|-------|-----------|---|---|
| 1.    | Metrics   | <p><b>Regression Model:</b><br/>MAE - , MSE - , RMSE - , R2 score -</p> <p><b>Classification Model:</b><br/>Confusion Matrix - , Accuray Score- &amp; Classification Report -</p> |  <pre> 1 model.fit(X_train, y_train)  + RandomForestRegressor RandomForestRegressor(random_state=42)  1 y_pred = model.predict(X_test)  1 from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score  1 mae = mean_absolute_error(y_test, y_pred) 2 mse = mean_squared_error(y_test, y_pred) 3 r2 = r2_score(y_test, y_pred) 4 5 print("Mean Absolute Error (MAE):", mae) 6 print("Mean Squared Error (MSE):", mse) 7 print("R2 Score:", r2)  Mean Absolute Error (MAE): 171.02609609173072 Mean Squared Error (MSE): 170421.94808313966 R2 Score: 0.9001226217296279  1 from sklearn.metrics import classification_report, confusion_matrix 2 3 print(confusion_matrix(y_test, dt_pred)) 4 print(classification_report(y_test, dt_pred)) 5 [[1606  16]  [  15 1649]] precision    recall  f1-score   support        0       0.99      0.99      0.99      1622       1       0.99      0.99      0.99      1664   accuracy          0.99  macro avg       0.99      0.99      0.99      3286 weighted avg       0.99      0.99      0.99      3286 </pre> |

|    |                |  |   |
|----|----------------|--|---|
| 2. | Tune the Model | Hyperparameter Tuning -<br>Validation Method - | <pre>1 from sklearn.model_selection import train_test_split 2 3 X_train, X_test, y_train, y_test = train_test_split( 4     X, y, 5     test_size=0.2, 6     random_state=42 7 ) 8</pre> |
|----|----------------|--|---|