Model Development Phase

Date	11th July 2024
Team ID	SWTID1720449665
Project Title	Predicting The Energy Output Of Wind Turbine Based On Weather Condition
Maximum Marks	6 Marks

Model Selection Report:

Model	Description	Hyperparameters	Performance Metric (e.g., Accuracy, F1 Score)
Random Forest Regression	The `RandomForestRegressor` is an ensemble learning method used to predict wind turbine energy output based on weather conditions. It constructs multiple decision trees and averages their predictions, effectively modeling complex, non-linear relationships between features like wind speed and direction. This approach reduces overfitting and enhances generalization to new data. Additionally, it provides insights into feature importance, helping identify key factors influencing energy production. The model is configured with specific hyperparameters to balance complexity and accuracy, making it a robust and versatile choice for forecasting wind energy based on historical weather data.	n_estimators=750, max_depth=4, max_leaf_nodes=500, random_state=1	Accuracy:91.23

Linear Regression Model	In the wind turbine energy prediction project, a Linear Regression model is used to establish a direct relationship between weather variables (wind speed, direction, temperature) and energy output. This approach helps understand the influence of different factors and provides a reliable method for forecasting turbine efficiency.	Nill	Accuracy:90.53
Decision Tree Model	In the wind turbine energy prediction project, a Decision Tree model uses weather variables to predict energy output. It captures complex relationships without assuming linearity, identifies influential weather factors, and provides clear, visual insights into their effects on turbine performance. Therefore, it is a useful tool for making accurate predictions and understanding data patterns..	random_state=0	Accuracy:83.50