PROBLEM STATEMENT

Date	16-11-2022
Team id	PNT2022TMID33245
Project Title	Predicting the energy output of wind turbine based on weather condition
Marks	4 Marks

Wind power generation differs from conventional thermal generation due to the stochastic nature of wind. Thus wind power forecasting plays a key role in dealing with the challenges of balancing supply and demand in any electricity system, given the uncertainty associated with the wind farm power output. Accurate wind power forecasting reduces the need for additional balancing energy and reserve power to integrate wind power. For a wind farm that converts wind energy into electricity power, a real-time prediction system of the output power is significant.

Wind plant has lower cost of energy compared to other renewable energy source for large scale application. Due to the different geographical patterns, weather, and properties of the wind turbines, a wind turbine may have various performances given different situations. If the total output of a wind power plant can be predicted with high accuracy, more useful information can be provided to the power companies to help in scheduling the power generation. This information will allow a more flexible and intelligent control at a WPP (Wind power Plant).

To develop a system with a computer science perspective on energy prediction based on weather data and analyzes the important parameters as well as their correlation on the energy output.

To deal with the interaction of the different parameters, we use symbolic regression based on the genetic programming tool DataModeler. Our studies are carried out on publicly available weather and energy data for a wind farm in Australia. We report on the correlation of the different variables for the energy output. The model obtained for energy prediction gives a very reliable prediction of the energy output for newly supplied weather data.