

Project Title : Predicting the Energy Output of Wind Turbine Based on Weather Conditions

I Introduction

1.1 Overview

Wind energy plays an increasing role in the supply of energy worldwide. The energy output of a wind farm is highly dependent on the weather conditions present at its site. If the output can be predicted more accurately, energy suppliers can coordinate the collaborative production of different energy sources more efficiently to avoid costly overproduction. In this project, we predict energy prediction based on weather data and analyze the important parameters as well as their correlation on the energy output.

1.2 Purpose

Our aim is to map weather data for energy production. We wish to show that even data that is publicly available for weather stations close to wind farms can be used to give a good prediction of the energy output. Furthermore, we examine the impact of different weather conditions on the energy output of wind farms.

2 LITURATURE SURVEY

2.1 Existing problem

We can not predict the Wind Energy accurately for different weather conditions at present manuaaly.

2.2 Proposed solution

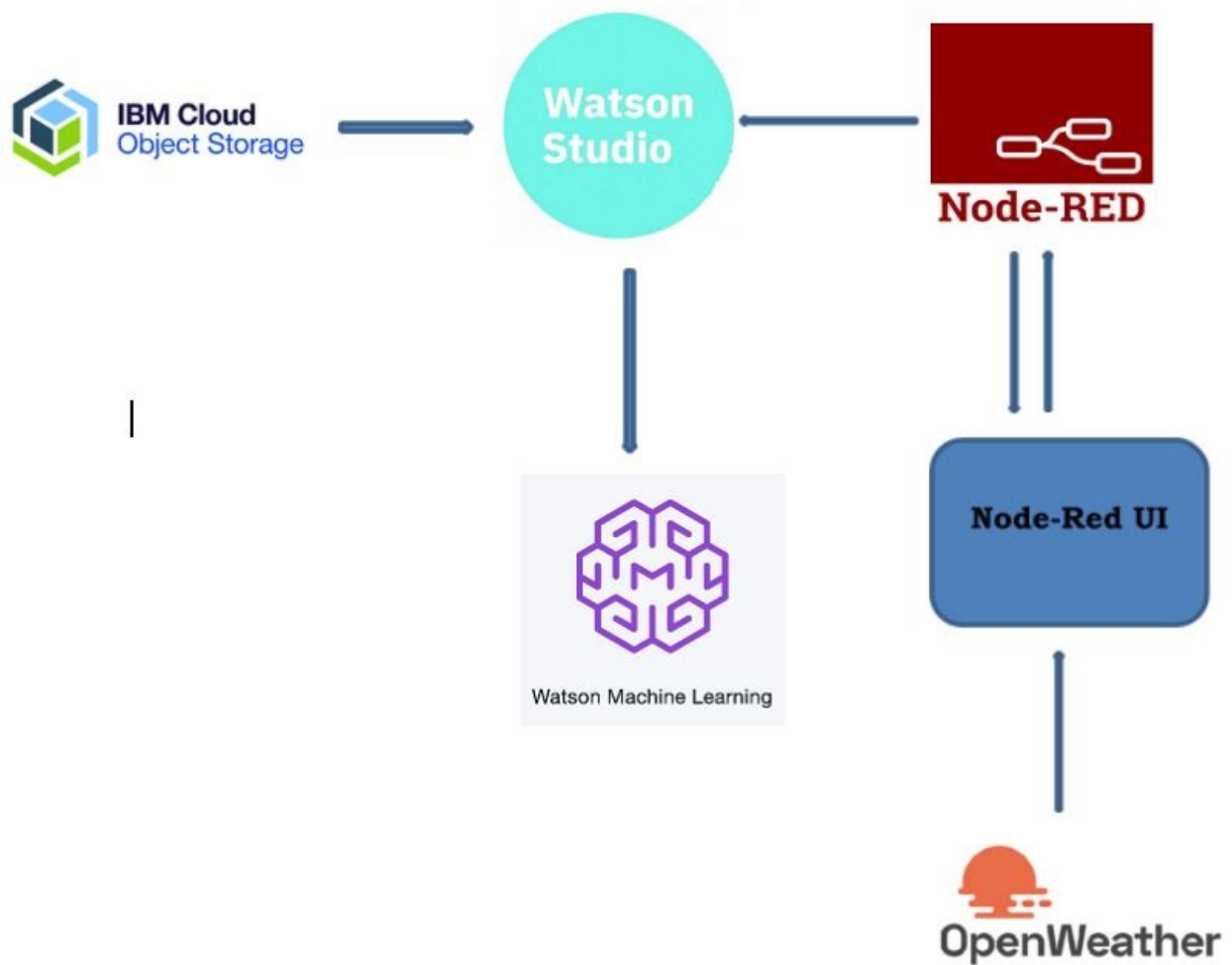
Develop an end to end web application to predict the energy output of the wind turbine based on weather conditions retrieved from the OpenWeather API. The application must be built with Python-Flask or Django framework with the machine

learning model trained & deployed on IBM Watson Studio.

3. THEORETICAL ANALYSIS

3.1 Block diagram :

The block diagram is as shown below.



3.2 Hardware / Software designing

Hardware : PC/Laptop with i5 core or higher , 8 GB RAM , Windows 10 or higher with all multimedia futures.

Softwares : IBM Nodered,IBM Watson Studio,IBM Machine Learning,IBM Cloud Object Storage

4. EXPERIMENTAL INVESTIGATIONS :

Refer to the files as screen shots in the folder - Experimental investigations uploaded on Github.

5. RESULTS :

Refer to the files - [1] output- IBM cloud pack data & [2] output-Node red data uploaded on Github.

6. Advantages :

Accurate

Precise

Less Humans need

Advance predictions

Energy management

7. Applications :

We can apply this to all Wind power plants.

8. Conclusion :

I can conclude that by using these techniques , predictions of Wind Energy output on different weather conditions are achievable nicely.

9. Future Scopes :

We can expand it & scalable to more.

10. Bibliography

Appendix

A. Source code : Refers to the Snippets folder uploaded on Github

B. Dataset : Refer to T1.csv file uploaded on Github