**Project Development Phase**

**Sprint 4**

|  |  |
| --- | --- |
| Team ID | PNT2022TMID21736 |
| Project Name | Predicting the energy output of wind turbine based on weather condition |

**Predict.html:**

**Predict.html**

<html>

<head>

<meta charset="UTF-8" />

<meta name="viewport" content="width=device-width, initial-scale=1.0" />

<meta http-equiv="X-UA-Compatible" content="ie=edge" />

<link rel="stylesheet"

href="https://use.fontawesome.com/releases/v5.7.2/css/all.css" integrity="sha384-

fnmOCqbTlWIlj8LyTjo7mOUStjsKC4pOpQbqyi7RrhN7udi9RwhKkMHpvLbHG

9Sr" crossorigin="anonymous" />

<link href="https://fonts.googleapis.com/css?family=Dosis" rel="stylesheet" />

<link rel="stylesheet" href="{{ url\_for('static', filename='css/style.css') }}">

<title>Wind Energy Prediction</title>

<style> table { width: 100%; border-collapse: collapse;

}

.card { margin-right: auto; margin-left: 12%; width: 350px; box-shadow: 0 15px 25px rgba(129, 124, 124, 0.2); border-radius: 10px; backdrop-filter: blur(14px); background-color: rgba(255, 255, 255, 0.5); padding: 15px; text-align: center;

}

.second{ top:80px; bottom:0px; margin:0px; left: 0px; right: 0px; position: fixed; padding: 0px; width: 100%; font-family:Georgia, serif; color:black; font-size:20px;

}

.inside{ top:80px; bottom:0px; margin:0px;

left: 60%; right: 0%; position: fixed; padding-left: 40px; padding-top:8%; padding-right:40px; font-family:Georgia, serif; color:#96f400; font-size:20px; text-align:justify;

}

.myButton{ border: none; text-align: center; cursor: pointer; text-transform: uppercase; outline: none; overflow: hidden; color: #fff; font-weight: 700; font-size: 12px; background-color: #183a1d; padding: 10px 15px;

margin: 0 auto; box-shadow: 0 5px 15px rgba(0,0,0,0.20); margin-left:17%;

} input { width:50%; margin-bottom: 10px; background: #e1eedd; border: none; outline: none; padding: 10px; font-size: 13px; color: #6c493a; text-shadow: white; border: #6c493a; border-radius: 4px; box-shadow: white; } ::placeholder { color: black; opacity: 1; }

.navbar { display: flex; align-items: center; padding: 20px; padding-left: 50px; padding-right: 30px; padding-top: 25px; line-height: 1.3;

}

.left{ top:80px; bottom:0px; margin:0px; left: 0%; right: 45.5%; position: fixed; padding-left: 10%; padding-top:5%; padding-right:40px; font-family:bold,Georgia, serif; color:rgb(255 204 0);; font-size:25px; align:center; } select { width:50%; margin-bottom: 10px; background: white; border: none; outline: none; padding: 10px; font-size: 13px; color: #183a1d; text-shadow: white;

border: #6c493a;

border-radius: 40px; box-shadow: white;

} input:focus { box-shadow: inset 0 -5px 45px rgba(100,100,100,0.4), 0 1px 1px rgba(255,255,255,0.2); } table, th, td { border: 1px solid rgb(86, 72, 128); border-collapse: collapse; color: #000ff0;

}

@media screen and (max-width: 500px) {

.left,

.second,

.third { width: 70%;

}

}

</style>

</head>

<body>

<div class="full-page">

<div class="navbar">

<div>

<a href="{{url\_for('home')}}">Wind

Energy<br><label>&nbsp;&nbsp;Renewable Energy is Our Fate!</label></a>

</div>

<nav>

<ul id='MenuItems'>

<li><a href="{{url\_for('predict')}}">Predict</a></li>

<li><a href="{{url\_for('about')}}">About</a></li>

<li><a href={{url\_for('services')}}>Services</a></li>

<li><a href={{url\_for('contact')}}>Contact</a></li>

</ul>

</nav>

</div>

</div>

<div class="second">

<div class="left">

<p style="padding: 10px; border: 3px solid rgb(148, 53, 16); width: 600px;">Give your city name to know the weather conditions</p>

<div style="margin-left:25%">

<form action="{{ url\_for('windapi')}}"method="post" >

<select name="city" required >

<option value="" selected>select City</option>

<option value ="Agartala" > Agartala </option>

<option value ="Aizawl" > Aizawl </option>

<option value ="Bengaluru" > Bengaluru </option>

<option value ="Bhopal" > Bhopal </option>

<option value ="Bhubaneswar" > Bhubaneswar </option>

<option value ="Chandigarh" > Chandigarh </option>

<option value ="Chennai" > Chennai </option>

<option value ="Daman" > Daman </option>

<option value ="Dehradun" > Dehradun </option>

<option value ="Delhi" > Delhi </option>

<option value ="Dispur" > Dispur </option>

<option value ="Gandhinagar" > Gandhinagar </option>

<option value ="Gangtok" > Gangtok </option>

<option value ="Hyderabad" > Hyderabad </option>

<option value ="Imphal" > Imphal </option>

<option value ="Itanagar" > Itanagar </option>

<option value ="Jaipur" > Jaipur </option>

<option value ="Kavaratti" > Kavaratti </option>

<option value ="Kohima" > Kohima </option>

<option value ="Kolkata" > Kolkata </option>

<option value ="Lucknow" > Lucknow </option>

<option value ="Mumbai" > Mumbai </option>

<option value ="Panaji" > Panaji </option>

<option value ="Patna" > Patna </option>

<option value ="Pondicherry" > Pondicherry </option>

<option value ="Port Blair" > Port Blair </option>

<option value ="Raipur" > Raipur </option>

<option value ="Ranchi" > Ranchi </option>

<option value ="Shillong" > Shillong </option>

<option value ="Shimla" > Shimla </option>

<option value ="Silvassa" > Silvassa </option>

<option value ="Srinagar" > Srinagar </option>

<option value ="Thiruvananthapuram"> Thiruvananthapuram </option>

<option value ="Tirupati" > Tirupati </option>

</select><br><br>

<div style="margin-left:-20%"><button type="submit" class="myButton" >Check the Weather Conditions</button></div>

</form>

</div>

<br>

<div class="card">

<table style="margin-left:2%; text-align:center; border-spacing:25px;">

<tr>

<td colspan="2" style="font-size:25px;">The weather conditions of the city are</td> </tr>

<tr>

<td>Temperature</td><td>{{temp}}</td>

</tr>

<tr>

<td>Humidity</td><td>{{humid}}</td>

</tr>

<tr>

<td>Pressure</td><td>{{pressure}}</td>

</tr>

<tr>

<td>Wind Speed</td><td>{{speed}}</td>

</tr>

</table>

</div>

</div>

<div class="inside">

<div style="font-size:23px;font-weight:bold;">Predict the Wind Energy!!</div>

<br><br>

<form action="{{ url\_for('y\_predict')}}"method="post">

<input type="text" name="theo" placeholder="Theoretical Power in KWh" required="required" />

<input type="text" name="wind" placeholder="Wind Speed in m/s" required="required" /><br><br>

<button type="submit" class="myButton" >Predict</button>

</form>

<br>

<br>

{{ prediction\_text }}

</div>

</div>

</body>

</html> **App.py**

import flask from flask import request, render\_template from flask\_cors import CORS import joblib import pandas as pd from xgboost import XGBRegressor import requests app = flask.Flask(\_\_name\_\_)

CORS(app)

# purposely kept API KEY since cuh is very less

API\_KEY = "t1xJwH\_pNvesyStso2tawTlpypHX0HEQJVMev99cmAtK" token\_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey":API\_KEY, "grant\_type": 'urn:ibm:params:oauth:granttype:apikey'}) mltoken = token\_response.json()["access\_token"] header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}

@app.route('/', methods=['GET']) def home():

return render\_template('index.html')

@app.route('/about') def about():

return render\_template('about.html')

@app.route('/predict') def predict():

return render\_template('predict.html')

@app.route('/services') def services():

return render\_template('services.html')

@app.route('/contact') def contact():

return render\_template('contact.html') @app.route('/windapi',methods=['POST']) def windapi():

city=request.form.get('city') apikey="86b1a085e43cad23bfd9c45d5fd88fc3"

url="http://api.openweathermap.org/data/2.5/weather?q="+city+"&appid="+apikey resp = requests.get(url) resp=resp.json() temp = str(float(resp["main"]["temp"])-273.15)+" °C" humid = str(resp["main"]["humidity"])+" %" pressure = str(resp["main"]["pressure"])+" mmHG" speed = str(float(resp["wind"]["speed"])\*0.44704)+" m/s" return render\_template('predict.html', temp=temp, humid=humid, pressure=pressure, speed=speed)

@app.route('/y\_predict',methods=['POST']) def y\_predict():

ws = float(request.form['theo']) wd = float(request.form['wind']) X = [[ws, wd]] xgr = XGBRegressor() df = pd.DataFrame(X, columns=['WindSpeed(m/s)', 'WindDirection']) payload\_scoring = {"input\_data": [{"field": [['ws', 'wd']], "values":X}]} response\_scoring = requests.post('https://us-

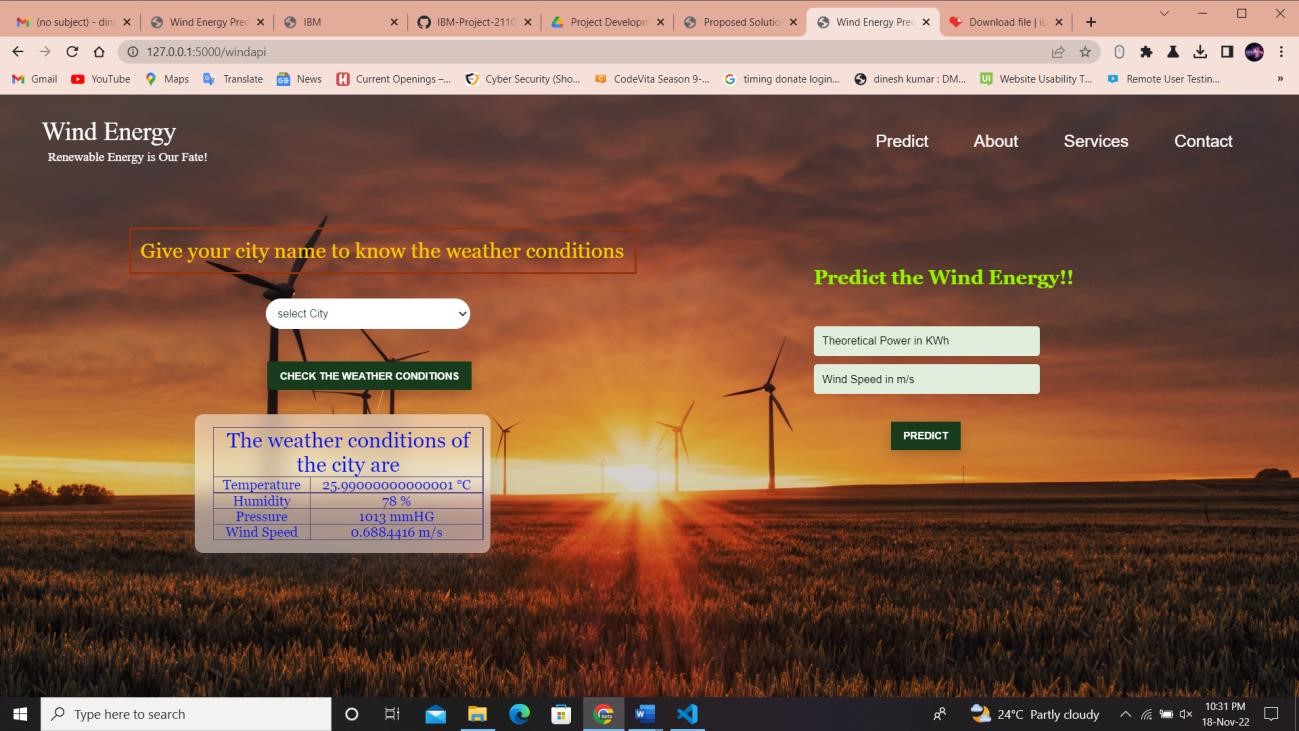
south.ml.cloud.ibm.com/ml/v4/deployments/0644c680-478f-475f-bc23-

2a64fc6490a5/predictions?version=2022-10-24',

json=payload\_scoring,headers={'Authorization': 'Bearer ' + mltoken}) print(response\_scoring) predictions = response\_scoring.json() print(predictions) output = predictions['predictions'][0]['values'][0][0] print("Final prediction :", predict) return render\_template('predict.html', prediction\_text="The energy predicted is {:.2f} KWh".format(output))

if \_\_name\_\_ == "\_\_main\_\_": app.run()

**Getting weather report from API**



**Predicting the wind turbine energy output**

