

Project Development Phase

Sprint 4

Team ID	PNT2022TMID15599
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-
fnmOCqbTIWIlj8LyTjo7mOUStjsKC4pOpQbqyi7RrhN7udi9RwhKkMHpvLbHG
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;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&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>


```
<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_pNvesyStso2tawTlpyyHX0HEQJVMev99cmAtK"

token_response = requests.post('https://iam.cloud.ibm.com/identity/token',
data={"apikey":API_KEY, "grant_type": 'urn:ibm:params:oauth:grant-
type: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)

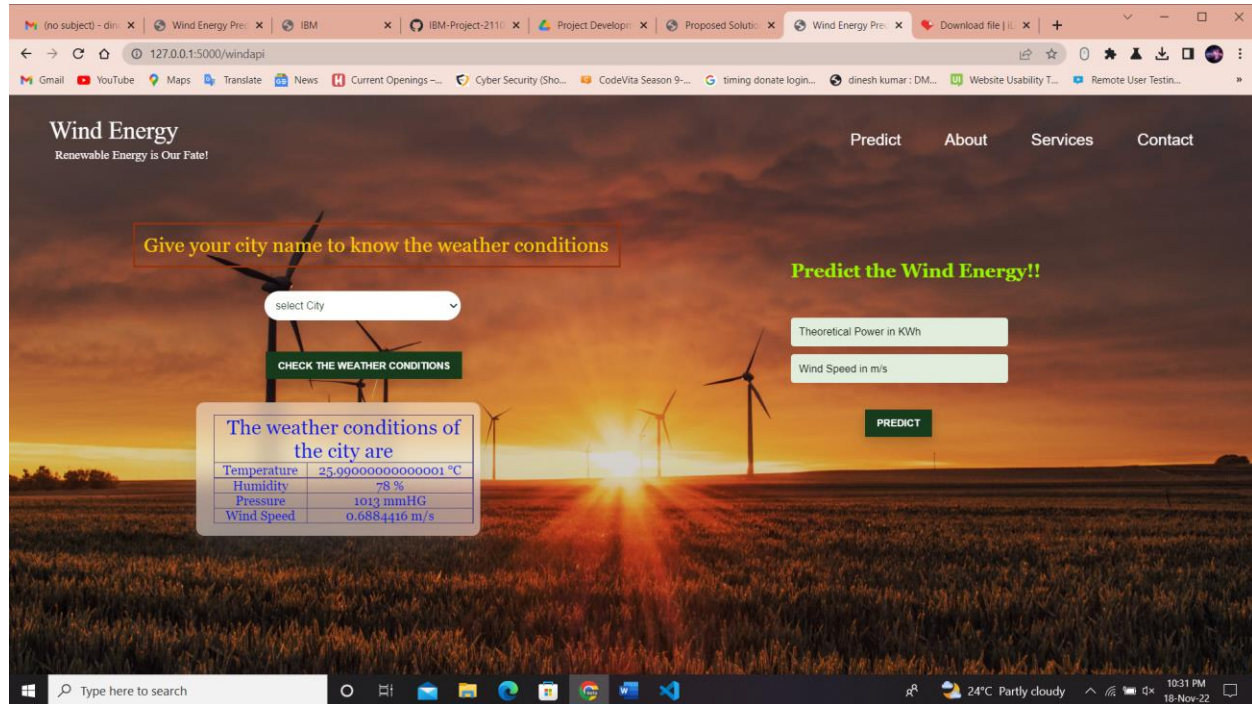
    return render_template('predict.html', prediction_text="The energy predicted is
{:.2f} KWh".format(output))

```

```
if __name__ == "__main__":
```

```
    app.run()
```

Getting weather report from API



Predicting the wind turbine energy output

