PROJECT DEVELOPMENT PHASE
Sprint 2

Date	19-Nov-22
Team ID	PNTIBM2022TMID52191
Project Name	Predicting the energy output of wind turbine based on weather condition
Maximum Marks	8 marks

Source Code :
FLASK Application:

```
import flask
import joblib
import numpy as np
import pandas as pd
import requests
from flask import render_template, request
from flask_cors import CORS
from xgboost import XGBRegressor

app = flask.Flask(__name__, static_url_path='')
CORS(app)

API_KEY = "HbsERqktGhGoDzwEicls3kLdXyrcM-Z071KIpvjmAKT3"
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 sendhomepage():
    return render_template('Index Page.html')


@app.route('/predict', methods=['POST'])
def predictenergy():
    print("working..")
    ws = float(request.form['ws'])
    wd = float(request.form['wd'])
    X = [[ws, wd]]
    xgr=XGBRegressor()
    df=pd.DataFrame(X, columns=['WindSpeed(m/s)', 'WindDirection'])
```

```python
payload_scoring = {"input_data": [{"fields": [['ws','wd']], "values":[3,4]}]}

response_scoring = requests.post('https://us-south.ml.cloud.ibm.com/ml/v4/deployments/198415bf-
21da-4777-9224-d0a04107abeb/predictions?version=2022-11-17', json=payload_scoring,
headers={'Authorization': 'Bearer ' + mltoken})
print("response_scoring")
predictions = response_scoring.json()
print(predictions)
predict = predictions['predictions'][0]['values'][0][0]
print("Final prediction :",predict)
return render_template('Predict Page.html',predict=predict)


if __name__ == '__main__':
    app.run()
```

Home Web Page :

```html
<!DOCTYPE html>
<html lang="en">
 <head>
  <meta charset="UTF-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <meta name="viewport" content="width=device-width, initial-scale=1.0" />
  <title>WIND TURBINE ENERGY PREDICTION</title>
  <style>
    body{
      background-image: url('Windmill.jpg');
      background-size: 100%;
    }
  </style>
  <style>
    h1{text-align: center;}
    h2{text-align: center;}
    p{text-align: center;}
  </style>
 </head>
 <body>
  <div class="container">
   <div class="glass">
      <h1 class="text" >WIND TURBINE ENERGY PREDICTION</h1>
      <h2 class="text">Using XGBoost Model</h2>
      <br />
      <form method="POST" action="/predict">
         <p class="text">Wind Speed</p>
         <h1><label><input type="text" id="ws" name="ws"></label></h1>
        <p class="text">Wind Direction</p>
        <h1><label><input type="text" id="wd" name="wd"></label></h1>
         <br />
         <br />
         <h1><button type="submit"  class="submit">Submit</button> </a></h1>
        </form>
      </div>
    </div>
   </body>
<form method="POST" action="/predict">
 <p class="text">Wind Speed</p>
 <input name="ws" required />
 <p class="text">Wind Direction</p>
 <input name="wd" required />
 <br />
```

```
        <br />
        <button type="submit" class="submit">Submit</button>
      </div>
    </div>
  </body>
</html>
```

Output Web Page :

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <style>
        body{
            background-image: url('Windmill.jpg');
            background-size: 100%;
        }
    </style>
    <title>WIND TURBINE ENERGY PREDICTION</title>
    <style>
        h1{text-align: center;}
        h3{text-align: center;}
    </style>
</head>
<body>

        <div class="container">
        <div class="glass door">
        <h1 class="text">The predicted Output power is</h1><br>
        <b><h3 class="highlight">2942.153564453125</h3></b><br>
          <a href=" http://127.0.0.1:5000" class="submit"><h1>Go Back</h1></a>
                </div>
        </div>
</body>
</html>
```

CSS:

```css
@import
url('https://fonts.googleapis.
com/css2?family=Mulish:it
al,wght@0,400;0,500;0,600
;1 ,400;1,500;1,600
display=swap');


html,
body {

overflow-x: hidden;
padding: 0;
margin: 0;
}
body {
 height: 100vh;
 width: 100vw;
}
body {
 scrollbar-gutter: 10px;
}
.container {
 height: 100%;
 width: 100%;
 background-image: url("4.jpg");
 background-size: cover;
 background-repeat: no-repeat;

}
.container,form{
   display: flex;
   justify-content: center;
   align-items: center;
   flex-direction: column;
}
.glass,.glassdoor{
   padding: 40px;
   background-color: rgba(0,0,0,.4);
   border-radius: 10px;
}
.glassdoor{
```

```css
    height: 200px;
    display: flex;
    flex-direction: column;
    align-items: center;
    justify-content:space-evenly;
    gap:10px;
}
input{
    margin-top: 5px;
    outline: 0;
    border: none;
    border-bottom: rgba(0,0,0,.7) 2px solid;
    background: transparent;

    padding: 6px;
    color:white;
}
input:focus{
    margin-top: 5px;
    background-color: rgba(0,0,0,.45);
    border-bottom: transparent 2px solid;
    border: none;
    outline: 0;
    border-radius: 4px;
    padding: 6px;
}

.text{
    font-family: "Mulish";
    color:rgba(255,255,255,.8);
    margin-bottom: 0;
    font-weight: 500;
    text-align: center;
}
.highlight{
    font-family: "Mulish";
    color:rgba(225, 214, 214, 0.8);
    margin-bottom: 10px;
    font-weight: 500;
    padding: 10px;
    background-color: rgba(0,0,0,.8);
    border-radius: 3px;
}
.submit{
    padding:10px 20px;
```

```css
    border-radius:
    3px; border: 0;
    background-
    color:rgba(255,255,255,.6);          font-
    weight: 600;
}
.submit:hover{
    cursor: pointer;
}
a{
    outline:none;
    text-decoration: none;
    color:inherit;
}
```