Intelligence Air Quality Sensing System using IBM Watson

1. INTRODUCTION

1.1OVERVIEW

An Intelligence Air Quality Sensing System using IBM Watson could be a system that uses IoT devices and sensors to collect air quality data and then utilizes the IBM Watson platform for analyzing and interpreting the data. The system could use Watson's machine learning and natural language processing capabilities to provide insights, alerts and predictions about the air quality in real-time. This information can be used to improve the air quality and make informed decisions about environmental policies, public health and urban planning.

1.2 PURPOSE

The purpose of an Intelligence Air Quality Sensing System using IBM Watson is to monitor and analyze air quality data in real-time and provide insights and predictions about the air quality. The system aims to improve air quality by providing actionable information to relevant stakeholders such as government agencies, businesses, and individuals. This information can be used to make informed decisions about environmental policies, public health, and urban planning. Additionally, the system can provide early warnings of potential air quality issues, enabling proactive measures to be taken to mitigate them.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

A new generation of air quality monitors is now being offered to provide localised, real-time air quality readings - but the potential benefit is only just starting to be realised.

It is generally accepted that whilst measurements from air quality reference stations are highly accurate, they are not sufficiently location-specific. Key pollutants – such as NO2 and PM2.5 – vary dramatically over short distances and time intervals, but the large size, maintenance requirements and relatively high cost of reference equipment

limits the places it can be installed. Diffusion tubes can offer a very cheap alternative and are much easier to install in specific locations, however they only offer a single reading over a number of weeks, and air quality professionals therefore rely on modelling techniques to fill the gaps. With research continuing to prove the extent to which air pollution varies significantly over space and time, the answer would be a reliable and accurate tool for taking real-time, localised measurements.

2.2 PROPOSED SYSTEM

The proposed system of an Intelligence Air Quality Sensing System would likely include the following components:

Improved IoT Sensors: The network of IoT sensors used for air quality data collection would be upgraded with advanced features, such as higher precision and reliability, to provide more accurate data.

Enhanced Data Collection and Transmission: The system would be designed to collect and transmit air quality data more efficiently and in real-time, using technologies such as 5G networks and edge computing.

Advanced Data Analysis and Processing: The system would use advanced algorithms and machine learning models to analyze and process the air quality data, providing deeper insights and more accurate predictions.

Interactive Dashboards and Reports: The system would provide real-time, interactive dashboards and reports to display the insights and predictions generated by the data analysis.

Automated Alerts and Notifications: The system would be designed to generate automated alerts and notifications when air quality levels reach critical levels, enabling stakeholders to take necessary measures in real-time.

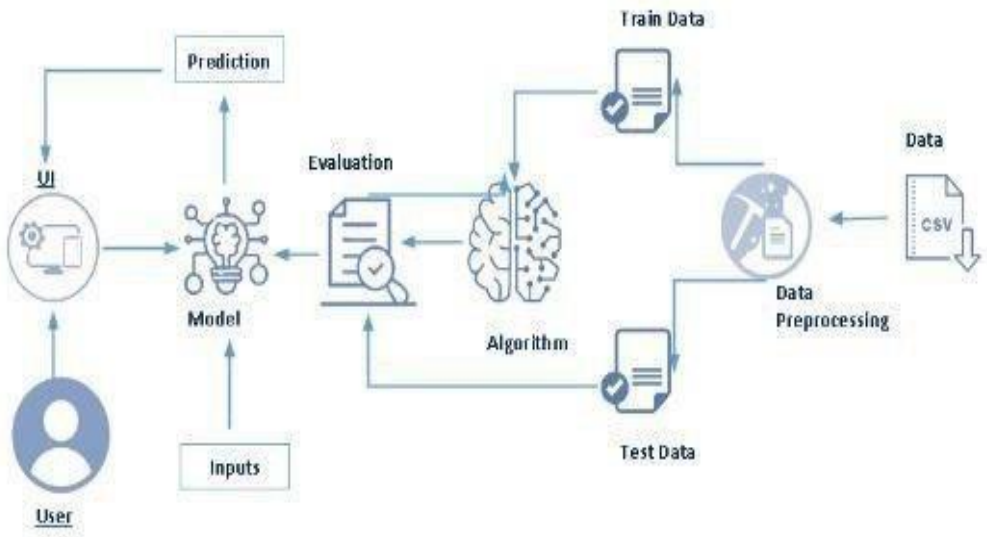
Integration with other systems: The proposed system would be designed to integrate with other systems, such as weather forecasting and traffic management systems, to

provide a more comprehensive view of the air quality and its impact on different aspects of the environment and human health.

Machine Learning Model Training: The system would be designed to continuously learn and improve by training the machine learning models with historical air quality data, leading to more accurate predictions over time.

3. THEORETICAL ANALYSIS

3.1 BLOCK DIAGRAM



3.2 HARDWARE AND SOFTWARE DESIGNING

Python

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. It was created by Guido van Rossum , and first released on February 20, 1991. Its high-level built in data structures, combined with dynamic typing and dynamic binding , make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python

interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Anaconda Navigator

Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning related applications. It can be installed on Windows, Linux, and macOS.Conda is an open-source, crossplatform, package management system. Anaconda comes with so very nice tools like JupyterLab, Jupyter Notebook, QtConsole, Spyder, Glueviz, Orange, Rstudio, Visual Studio Code. For this project, we will be using Jupyter notebook and Spyder.

Jupyter Notebook

The Jupyter Notebook is an open source web application that you can use to create and share documents that contain live code, equations, visualizations, and text. Jupyter Notebook is maintained by the people at Project Jupyter. Jupyter Notebooks are a spin-off project from the IPython project, which used to have an IPython Notebook project itself. The name, Jupyter, comes from the core supported programming languages that it supports: Julia, Python, and R. Jupyter ships with the IPython kernel, which allows you to write your programs in Python, but there are currently over 100 other kernels that you can also use.

Spyder

Spyder, the Scientific Python Development Environment, is a free integrated development environment (IDE) that is included with Anaconda. It includes editing, interactive testing, debugging, and introspection features. Initially created and developed by Pierre Raybaut in 2009, since 2012 Spyder has been maintained and continuously improved by a team of scientific Python developers and the community.Spyder is extensible with first-party and third party plugins includes support for interactive tools for data inspection and embeds Pythonspecific code. Spyder is also pre-installed in Anaconda Navigator, which is included in Anaconda.

Flask

Webframework used for building. It is a web application framework written in python which will be running in local browser with a user interface. In this application, whenever the user interacts with UI and selects emoji, it will suggest the best and top movies of that genre to the user.

Hardware Requirements: Operating system: window 7 and above with 64bit

Processor Type -Intel

Core i3-3220

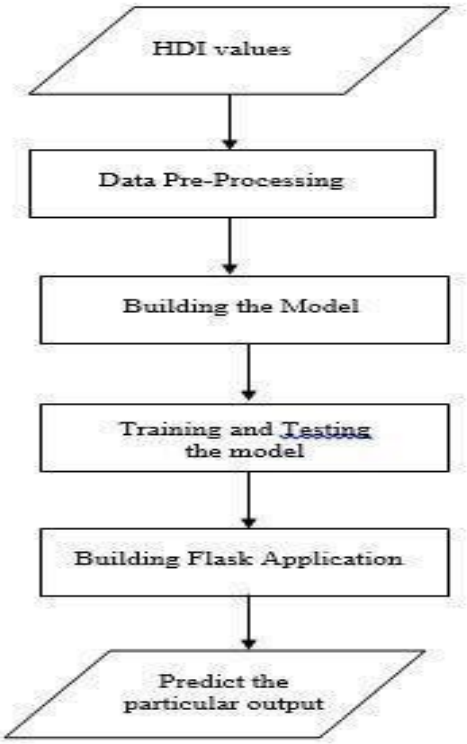
RAM: 4Gb and above

Hard disk: min 100GB

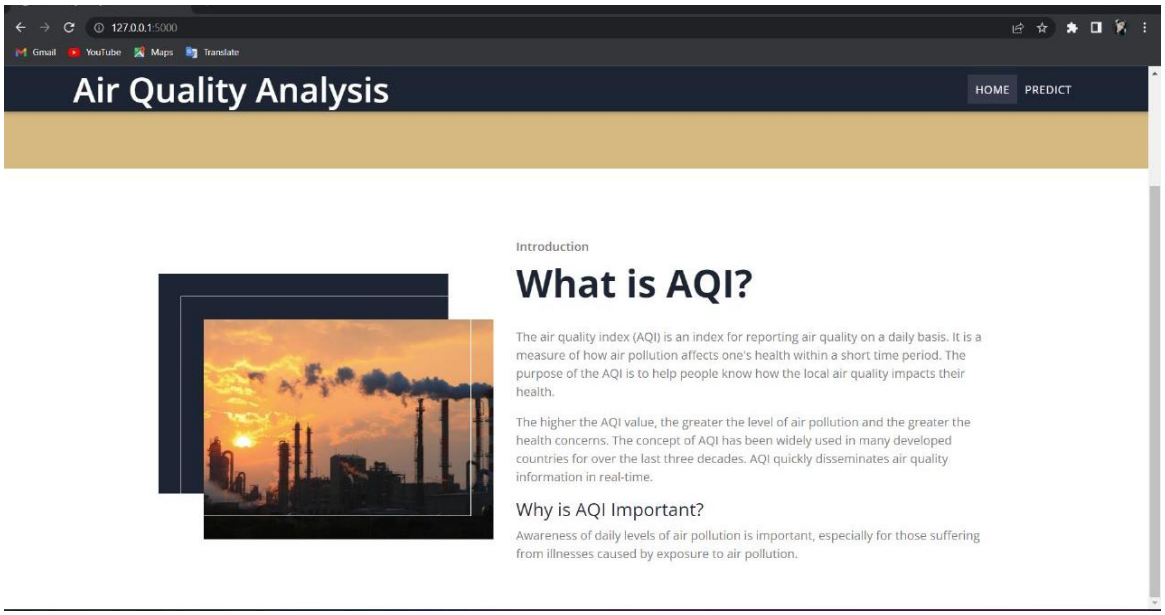
4. EXPERIMENTAL INVESTIGATION

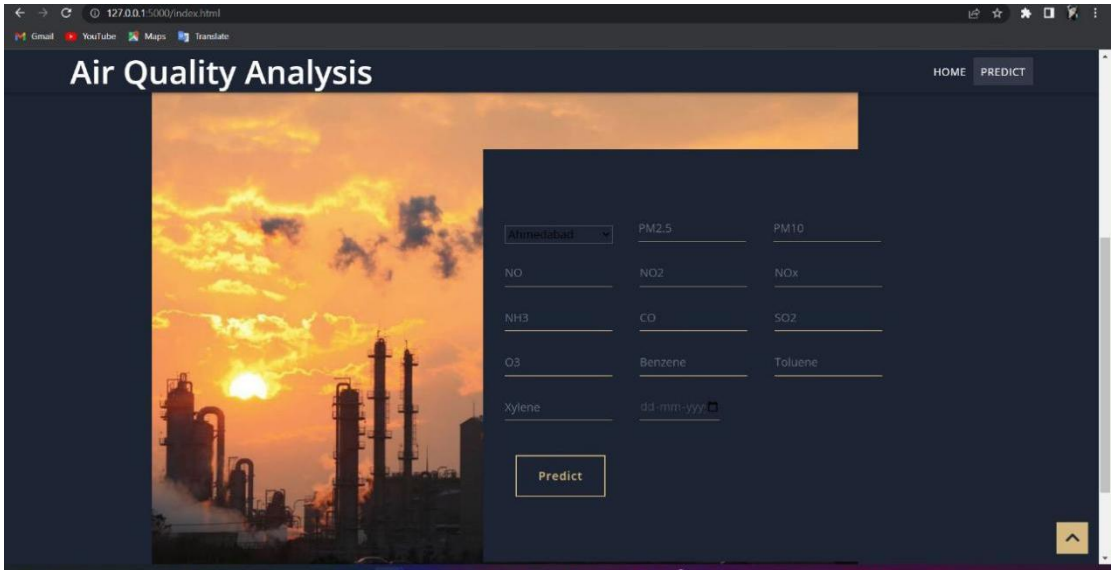
The text data need to be organized before proceeding with the project. The original dataset has a single folder. We will be using the city_day.csv file to fetch the text data of training data. The datas need to be unique and all fields need to be filled.The dataset images are to be pre-processed before giving to the model. We will create a function that uses the pre-trained model for predicting custom outputs. Then we have to test and train the model. After the model is build, we will be integrating it to a web application

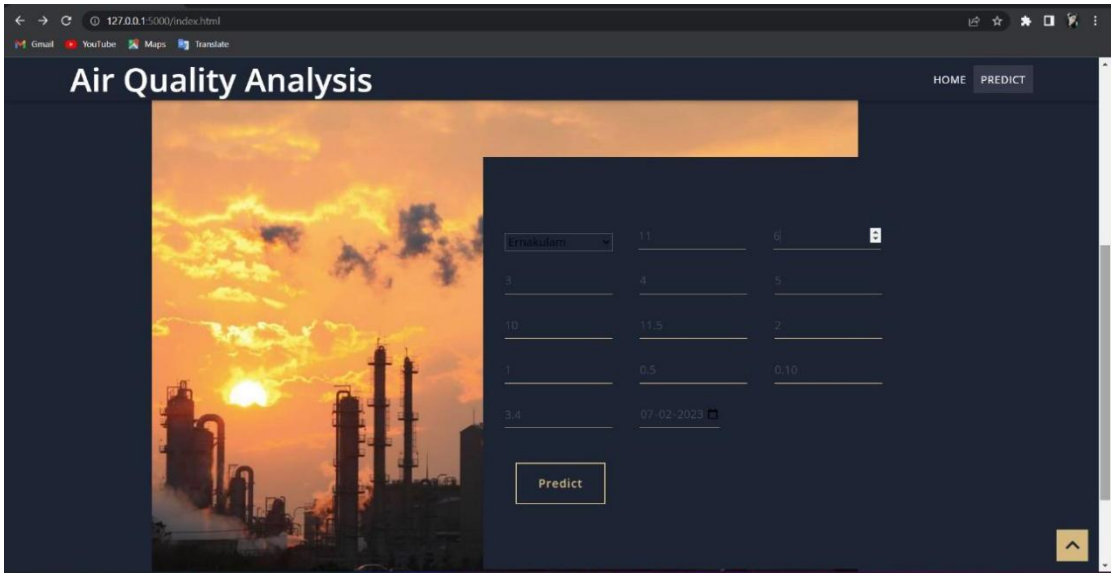
5. FLOWCHART

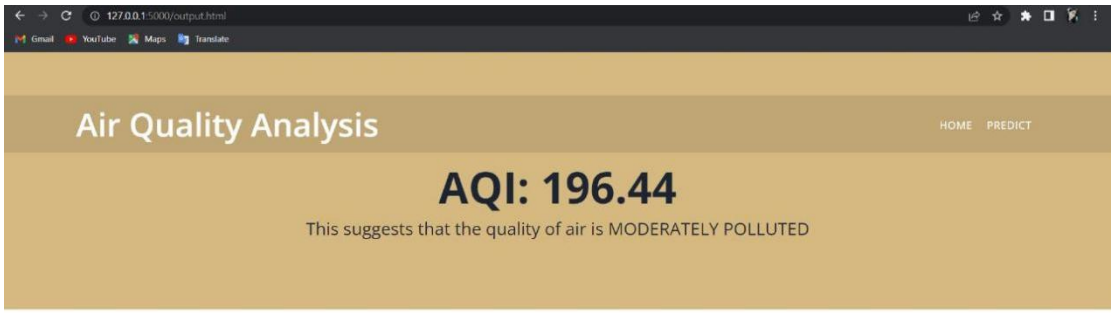


6. RESULT


127.0.0.1:5000
Gmail
YouTube
Maps
Translate
Air Quality Analysis
HOME
PREDICT
Introduction
What is AQI?
The air quality index (AQI) is an index for reporting air quality on a daily basis. It is a measure of how air pollution affects one's health within a short time period. The purpose of the AQI is to help people know how the local air quality impacts their health.
The higher the AQI value, the greater the level of air pollution and the greater the health concerns. The concept of AQI has been widely used in many developed countries for over the last three decades. AQI quickly disseminates air quality information in real-time.
Why is AQI Important?
Awareness of daily levels of air pollution is important, especially for those suffering from illnesses caused by exposure to air pollution.


127.0.0.1:5000/index.html
Gmail
YouTube
Maps
Translate
Air Quality Analysis
HOME
PREDICT
Ahmedabad
PM2.5
PM10
NO
NO2
NOx
NH3
CO
SO2
O3
Benzene
Toluene
Xylene
dd-mm-yyyy
Predict





7. ADVANTAGES

Easy to use

- Cost efficient
- Time efficient

8. CONCLUSION

In conclusion, an Intelligence Air Quality Sensing System using IBM Watson can provide valuable insights and predictions about air quality, enabling stakeholders to make informed decisions and take proactive measures to improve the air quality. The system leverages the advanced capabilities of IBM Watson, such as machine learning and natural language processing, to provide real-time information on air quality. The proposed system includes advanced features, such asenhanced data collection and transmission, and machine learning model training, to provide even more accurate and actionable information. By providing real-time, accurate information about air quality, the system can help to improve public health, reduce environmental impacts, and support sustainable urban planning.

9. FUTURE SCOPE

In future works, the proposed method will be improved in order to classify the air quality of different cities with extra features using more advanced technology.

10.BIBILOGRAPHY

https://en.wikipedia.org/wiki/Air_pollution_measurement
https://www.mdpi.com/2079-9292/8/7/801#:~:text=An%20intelligent%20air%20quality%20sensing%20system%20handles%20the%20effective%20utilization,with%20the%20proposed%20SVM%20classifier.

APPENDIX

SOURCE CODE

APP.PY

```
from flask import Flask, render_template, request
import pickle, joblib
import pandas as pd

app = Flask(_name_)

model = pickle.load(open("model.pkl","rb"))
le = joblib.load('label_values')

@app.route('/')
def home():
    return render_template("home.html")

@app.route('/index.html')
```

```
def predict():
    return render_template("index.html")

@app.route('/output.html', methods =["POST"])
def output():
 if request.method == 'POST':
        city = request.form["city"]
        pm25 = request.form["pm25"]
        pm10 = request.form["pm10"]
        no = request.form["no"]
        no2 = request.form["no2"]
        nox = request.form["nox"]
        nh3 = request.form["nh3"]
        co = request.form["co"]
        so2 = request.form["so2"]
        o3 = request.form["o3"]
        benzene = request.form["benzene"]
        toluene = request.form["toluene"]
        xylene = request.form["xylene"]
        date = request.form["date"]

        city = le.transform([city])

        year = date.split('-')[0]
        month = date.split('-')[1]
 feature_cols = ['City', 'PM2.5', 'PM10', 'NO', 'NO2', 'NOx', 'NH3', 'CO', 'SO2',
                    'O3','Benzene', 'Toluene', 'Xylene', 'Year', 'Month']

        data = pd.DataFrame([[city,pm25,pm10,no,no2,nox,nh3,co,so2,o3,
                          benzene,toluene,xylene,year,month]], columns=feature_cols)

        pred = model.predict(data)
        pred=pred[0]

        if (pred>=0 and pred<=50):
            res = 'GOOD'
        elif (pred>50 and pred<=100):
            res= 'SATISFACTORY'
        elif (pred>100 and pred<=200):
            res = 'MODERATELY POLLUTED'
        elif (pred>200 and pred<=300):
            res = 'POOR'
        elif (pred>300 and pred<=400):
            res = 'VERY POOR'
        else:
            res = 'SEVERE'

        return render_template("output.html",y=("AQI: "+str(pred)), z =res)
if _name_ == '_main_':
    app.run(debug = True)
```

home.html

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="utf-8">
        <title>Air Quality Analysis</title>
        <meta content="width=device-width, initial-scale=1.0" name="viewport">
        <meta content="Free Website Template" name="keywords">
        <meta content="Free Website Template" name="description">

        <!-- Favicon -->
        <link href="img/favicon.ico" rel="icon">

        <!-- Google Font -->
        <link
href="https://fonts.googleapis.com/css2?family=Open+Sans:wght@300;400;600;700;
800&display=swap" rel="stylesheet">

        <!-- CSS Libraries -->
        <link
href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css"
rel="stylesheet">
        <link                    href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.10.0/css/all.min.css" rel="stylesheet">
        <link href="static/lib/animate/animate.min.css" rel="stylesheet">
        <link                href="static/lib/owlcarousel/assets/owl.carousel.min.css"
rel="stylesheet">
        <link href="static/lib/lightbox/css/lightbox.min.css" rel="stylesheet">

        <!-- Template Stylesheet -->
        <link href="static/css/style.css" rel="stylesheet">
    </head>

    <body>
        <!-- Top Bar Start -->

        <!-- Top Bar End -->

        <!-- Nav Bar Start -->
        <div class="navbar navbar-expand-lg bg-dark navbar-dark">
            <div class="container-fluid">
                <a href="/" class="navbar-brand">Air Quality Analysis</a>
                <button type="button" class="navbar-toggler" data-toggle="collapse"
data-target="#navbarCollapse">
                    <span class="navbar-toggler-icon"></span>
                </button>

                <div class="collapse navbar-collapse justify-content-between"
id="navbarCollapse">
```

```
                <div class="navbar-nav ml-auto">
                    <a href="/" class="nav-item nav-link active">Home</a>

                    <a href="index.html" class="nav-item nav-link">Predict</a>
                </div>
            </div>
        </div>
    </div>
    <!-- Nav Bar End -->


    <!-- Page Header Start -->
    <div class="page-header">
        <div class="container">
            <div class="row">
                <div class="col-12">
                    <h2>Home</h2>
                </div>

            </div>
        </div>
    </div>
    <!-- Page Header End -->


    <!-- About Start -->
    <div class="about">
        <div class="container">
            <div class="row align-items-center">
                <div class="col-lg-5 col-md-6">
                    <div class="about-img">
                        <img src="static/img/about.jpg" alt="Image">
                    </div>
                </div>
                <div class="col-lg-7 col-md-6">
                    <div class="section-header text-left">
                        <p>Introduction</p>
                        <h2>What is AQI?</h2>
                    </div>
                    <div class="about-text">
                        <p>
```
The air quality index (AQI) is an index for reporting air quality on a daily basis. It is a measure of how air pollution affects one's health within a short time period. The purpose of the AQI is to help people know how the local air quality impacts their health.
```
                        </p>
                        <p>
```
The higher the AQI value, the greater the level of air pollution and the greater the health concerns. The concept of AQI has been widely used in

many developed countries for over the last three decades. AQI quickly disseminates air quality information in real-time.

```
                        </p>
                        <h4>Why is AQI Important?</h4>

                        <p>
                          Awareness of daily levels of air pollution is important, especially for those suffering from illnesses caused by exposure to air pollution.
                        </p>
                      </div>
                    </div>
                  </div>
                </div>
              </div>
              <!-- About End -->


              <!-- Team Start -->
              <!-- Team End -->


              <!-- Footer Start -->

              <!-- Footer End -->

              <a href="#" class="back-to-top"><i class="fa fa-chevron-up"></i></a>

              <!-- JavaScript Libraries -->
              <script src="https://code.jquery.com/jquery-3.4.1.min.js"></script>
              <script
src="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/js/bootstrap.bundle.min.js"><
/script>
              <script src="static/lib/easing/easing.min.js"></script>
              <script src="static/lib/owlcarousel/owl.carousel.min.js"></script>
              <script src="static/lib/isotope/isotope.pkgd.min.js"></script>
              <script src="static/lib/lightbox/js/lightbox.min.js"></script>

              <!-- Contact Javascript File -->
              <script src="static/mail/jqBootstrapValidation.min.js"></script>
              <script src="static/mail/contact.js"></script>

              <!-- Template Javascript -->
              <script src="static/js/main.js"></script>
            </body>
          </html>
```

Index.html

```
<!DOCTYPE html>
<html lang="en">
   <head>
      <meta charset="utf-8">
      <title>Air Quality Analysis</title>
      <meta content="width=device-width, initial-scale=1.0" name="viewport">
      <meta content="Free Website Template" name="keywords">
      <meta content="Free Website Template" name="description">

      <!-- Favicon -->
      <link href="static/img/favicon.ico" rel="icon">

      <!-- Google Font -->
      <link
href="https://fonts.googleapis.com/css2?family=Open+Sans:wght@300;400;600;700;
800&display=swap" rel="stylesheet">

      <!-- CSS Libraries -->
      <link
href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css"
rel="stylesheet">
      <link                    href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.10.0/css/all.min.css" rel="stylesheet">
      <link href="static/lib/animate/animate.min.css" rel="stylesheet">
      <link href="static/lib/owlcarousel/assets/owl.carousel.min.css" rel="stylesheet">
      <link href="static/lib/lightbox/css/lightbox.min.css" rel="stylesheet">

      <!-- Template Stylesheet -->
      <link href="static/css/style.css" rel="stylesheet">
   </head>

   <body>
      <!-- Top Bar Start -->
```

```
<!-- Top Bar End -->

<!-- Nav Bar Start -->
<div class="navbar navbar-expand-lg bg-dark navbar-dark">
  <div class="container-fluid">
    <a href="/" class="navbar-brand">Air Quality Analysis</a>
    <button type="button" class="navbar-toggler" data-toggle="collapse" data-target="#navbarCollapse">
      <span class="navbar-toggler-icon"></span>
    </button>

    <div class="collapse navbar-collapse justify-content-between" id="navbarCollapse">
      <div class="navbar-nav ml-auto">

        <a href="/" class="nav-item nav-link">Home</a>

        <a href="index.html" class="nav-item nav-link active">Predict</a>
      </div>
    </div>
  </div>
</div>
<!-- Nav Bar End -->


<!-- Page Header Start -->
<div class="page-header">
  <div class="container">
    <div class="row">
      <div class="col-12">
        <h2>Predict</h2>
      </div>
      <div class="col-12">
```

```
                <a href="">Home</a>
                <a href="">Predict</a>
            </div>
        </div>
    </div>
</div>
<!-- Page Header End -->


<!-- Contact Start -->
<div class="section-header text-center" style="margin-top: 90px;">

    <h2>Enter inputs below</h2>
</div>
<div class="contact" style="margin-bottom: 90px;">

    <div class="container-fluid">
        <div class="container">

            <div class="row align-items-center">

                <div class="col-lg-5 col-md-6">
                    <div class="about-img">
                        <img src="static/img/about.jpg" alt="Image">
                    </div>
                </div>

                <div class="contact-form">
                    <div id="success"></div>
                    <form name="sentMessage" id="contactForm"
novalidate="novalidate" action = "/output.html" method = "post">
                        <div class="row">

                        <div class="custom-select">
```

```
<!-- Favicon  <label for = "city">City</label><br>-->
<select name= "city" style="width:150px;
background:none;">
<option value = "Ahmedabad"> Ahmedabad </option>
<option value = "Aizawl"> Aizawl </option>
<option value = "Amaravati"> Amaravati </option>
<option value = "Amritsar"> Amritsar </option>
<option value = "Bengaluru"> Bengaluru </option>
<option value = "Bhopal"> Bhopal </option>
<option value = "Brajrajnagar"> Brajrajnagar </option>
<option value = "Chandigarh"> Chandigarh </option>
<option value = "Chennai"> Chennai </option>
<option value = "Coimbatore"> Coimbatore </option>
<option value = "Delhi"> Delhi </option>
<option value = "Ernakulam"> Ernakulam </option>
<option value = "Gurugram"> Gurugram </option>
<option value = "Guwahati"> Guwahati </option>
<option value = "Hyderabad"> Hyderabad </option>
<option value = "Jaipur"> Jaipur </option>
<option value = "Jorapokhar"> Jorapokhar </option>
<option value = "Kochi"> Kochi </option>
<option value = "Kolkata"> Kolkata </option>
<option value = "Lucknow"> Lucknow </option>
<option value = "Mumbai"> Mumbai </option>
<option value = "Patna"> Patna </option>
<option value = "Shillong"> Shillong </option>
<option value = "Talcher"> Talcher </option>
<option value = "Thiruvananthapuram">
Thiruvananthapuram </option>
<option value = "Visakhapatnam"> Visakhapatnam
</option>
</select>
```

```
                    </div>
                    <div class="control-group">
                      <input type="number" class="form-control" id="pm25" name="pm25" placeholder="PM2.5"  />
                      <br>
                    </div>
                    <div class="control-group">
                      <input type="number" class="form-control" id="pm10" name="pm10" placeholder="PM10" />
                      <br>
                    </div>

                    </div>

                    <div class="row">
                    <div class="control-group">
                      <input type="number" class="form-control" id="no" name="no" placeholder="NO" required="required" />
                      <br>
                    </div>

                    <div class="control-group">
                      <input type="number" class="form-control" id="no2" name="no2" placeholder="NO2" required="required" data-validation-required-message="Please enter a subject" />
                      <br>
                    </div>

                    <div class="control-group">
                      <input type="number" class="form-control" id="nox" name="nox" placeholder="NOx" required="required" data-validation-required-message="Please enter your name" />
                      <br>
                    </div>
```

```
                    </div>
                    <div class="row">
                    <div class="control-group">
                      <input type="number" class="form-control" id="nh3" name="nh3" placeholder="NH3" required="required" data-validation-required-message="Please enter your email" />
                      <br>
                    </div>
                    <div class="control-group">
                      <input type="number" class="form-control" id="co" name="co" placeholder="CO" required="required" data-validation-required-message="Please enter a subject" />
                      <br>
                    </div>
                    <div class="control-group">
                      <input type="number" class="form-control" id="so2" name="so2" placeholder="SO2" required="required" data-validation-required-message="Please enter your email" />
                      <br>
                    </div>
                    </div>

                    <div class="row">
                    <div class="control-group">
                      <input type="number" class="form-control" id="o3" name="o3" placeholder="O3" required="required" data-validation-required-message="Please enter a subject" />
                      <br>
                    </div>

                    <div class="control-group">
                      <input type="number" class="form-control" id="benzene" name="benzene" placeholder="Benzene" required="required" data-validation-required-message="Please enter your name" />
```

```
                        <br>
                    </div>
                    <div class="control-group">
                        <input type="number" class="form-control" id="toluene" name="toluene" placeholder="Toluene" required="required" data-validation-required-message="Please enter your email" />
                        <br>
                    </div>
                    </div>

                    <div class="row">
                    <div class="control-group">
                        <input type="number" class="form-control" id="xylene" name="xylene" placeholder="Xylene" required="required" data-validation-required-message="Please enter a subject" />
                        <br>
                    </div>
                    <div class="control-group">
                        <input type="date" class="form-control" id="date" name="date" placeholder="Date" required="required" data-validation-required-message="Please enter your email" />
                        <br>
                    </div>
                    </div>

                    <br>
                    <div>
                        <a href="output.html" ><button class="btn" type="submit">Predict</button></a>
                    </div>

                </form>
            </div>
```

```
                    </div>

                </div>

            </div>
        </div>
    </div>
    <!-- Contact End -->


    <!-- Footer Start -->

    <!-- Footer End -->

    <a href="#" class="back-to-top"><i class="fa fa-chevron-up"></i></a>

    <!-- JavaScript Libraries -->
    <script src="https://code.jquery.com/jquery-3.4.1.min.js"></script>
    <script
src="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/js/bootstrap.bundle.min.js"><
/script>
    <script src="static/lib/easing/easing.min.js"></script>
    <script src="static/lib/owlcarousel/owl.carousel.min.js"></script>
    <script src="static/lib/isotope/isotope.pkgd.min.js"></script>
    <script src="static/lib/lightbox/js/lightbox.min.js"></script>

    <!-- Contact Javascript File
    <script src="static/mail/jqBootstrapValidation.min.js"></script>
    <script src="static/mail/contact.js"></script> -->

    <!-- Template Javascript -->
    <script src="static/js/main.js"></script>
  </body>
</html>
```

Output.html

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="utf-8">
        <title>Air Quality Analysis</title>
        <meta content="width=device-width, initial-scale=1.0" name="viewport">
        <meta content="Free Website Template" name="keywords">
        <meta content="Free Website Template" name="description">

        <!-- Favicon -->
        <link href="static/img/favicon.ico" rel="icon">

        <!-- Google Font -->
        <link
href="https://fonts.googleapis.com/css2?family=Open+Sans:wght@300;400;600;700;
800&display=swap" rel="stylesheet">

        <!-- CSS Libraries -->
        <link
href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css"
rel="stylesheet">
        <link                    href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.10.0/css/all.min.css" rel="stylesheet">
        <link href="static/lib/animate/animate.min.css" rel="stylesheet">
        <link href="static/lib/owlcarousel/assets/owl.carousel.min.css" rel="stylesheet">
        <link href="static/lib/lightbox/css/lightbox.min.css" rel="stylesheet">

        <!-- Template Stylesheet -->
        <link href="static/css/style.css" rel="stylesheet">
    </head>

    <body>
        <!-- Top Bar Start -->
```

```
<!-- Top Bar End -->

<!-- Nav Bar Start -->
<div class="navbar navbar-expand-lg bg-dark navbar-dark">
  <div class="container-fluid">
    <a href="/" class="navbar-brand">Air Quality Analysis</a>
    <button type="button" class="navbar-toggler" data-toggle="collapse" data-target="#navbarCollapse">
      <span class="navbar-toggler-icon"></span>
    </button>

    <div class="collapse navbar-collapse justify-content-between" id="navbarCollapse">
      <div class="navbar-nav ml-auto">

        <a href="/" class="nav-item nav-link">Home</a>

        <a href="index.html" class="nav-item nav-link">Predict</a>
      </div>
    </div>
  </div>
</div>
<!-- Nav Bar End -->


<!-- Page Header Start -->
<div class="page-header">
  <div class="container">
    <div class="row">
      <div class="col-12">
        <h2>{{y}}</h2>
        <h4>This suggests that the quality of air is {{z}}</h4>
      </div>
```

```
            </div>
          </div>
        </div>
        <!-- Page Header End -->
        <!-- Service Start --
        <!-- Service End -->
        <!-- Footer Start -->
        <!-- Footer End -->
        <a href="#" class="back-to-top"><i class="fa fa-chevron-up"></i></a>
        <!-- JavaScript Libraries -->
        <script src="https://code.jquery.com/jquery-3.4.1.min.js"></script>
        <script
src="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/js/bootstrap.bundle.min.js"><
/script>
        <script src="static/lib/easing/easing.min.js"></script>
        <script src="static/lib/owlcarousel/owl.carousel.min.js"></script>
        <script src="static/lib/isotope/isotope.pkgd.min.js"></script>
        <script src="static/lib/lightbox/js/lightbox.min.js"></script>

        <!-- Contact Javascript File -->
        <script src="static/mail/jqBootstrapValidation.min.js"></script>
        <script src="static/mail/contact.js"></script>

        <!-- Template Javascript -->
        <script src="static/js/main.js"></script>
    </body>
</html>
```