AIR QUALITY PREDICTION

INTRODUCTION:

To implement this AIR QUALITY PREDICTION project , Artificial Intelligence using Python is used.

1.PYTHON PROGRAMMING :

python is an OOPs based,high level,interpreted programming language.It is a robust highly useful language focused on rapidly applications development(RAD) and don't repeat yourself(DRY).It works perfectly as a glue language as well i.e. to connect existing components together.Due to the ease of learning,scalability and adaptability of python,it has become one of the fastest growing languages.Python's support and ever evolving libraries make it a good choice for any project whether Web App,Mobile App,IoT,Data Science or AI.

2.ARTIFICIAL INTELLIGENCE :

In computer science,artificial intelligence(AI),sometimes called machine intelligence,is intelligence demonstrated by machines,in contrast to the natural intelligence displayed by humans and animals.Colloquially,the term "artificial intelligence" is used to describe machines that mimic "cognitive" functions that humans associate with other human minds, such as "learning" and "problem solving".

Concepts involved in artificial intelligence:

1.Machine Learning(ML):

It involves 2 parts :

a.Deep Learning

b.Predictive Analysis

2.Robotics

3.Vision : This deals with image recognition and machine vision.

4.Natural Language Processing(NLP) :

It involves the following :

a.Translation

b.Classification and Clustering

c.Information Extraction

5.Expert System

6.Planning: Scheduling and Optimization

7.Speech : This deals with transformations either : speech to text or text to speech.

Objectives of the Project :

The project address three interrelated problems :

* Objective 1 : Low-cost sensor development :

Development and validation of a low-cost sensor array system to measure all the parameters needed for air quality index determination.

* Objective 2 : Deployment and data acquisition :

Development and validation of tetchniques for obtaining air quality data at high enough spatio-temporal resolution, over sustained periods at city scale, with guarantees on the quality of the data, while keeping the costs of data acquisition sufficiently low, to allow for vastly improving understanding of a variety of air pollution related challenges.

* Objective 3 : Analytics and Modelling :

Determination of the sources of the pollutants and qualify their contributions (espicially for vehicular sources) via a combination of multi-modal non-invasive sensing, air quality modelling and statistical inference techniques.

Problem Statement :

Air Pollution is very in densely populated areas like Delhi,especially in Winter.Poor quality in th eair can lead to Smog, which can restrict outdoor activites and can cause Health concerns. A crucial first step in solving the air pollution problem is to enable the citizens to guage the quality of the air they breathe. This could be done by pollution sensors. But these are expensive. Our project is one which is inexpensive and makes the prediction accessible to everyone. Solar Radiation, Wind Speed, Temperature, value of the Month.Using these input parameters, the system predicts the value of the ozone and determines the category in which the ozone falls.

Review of Literature :

The User Interface contains a description of the Air Quality Prediction and a form in which user has to input the four parameters.They are :

1. Solar Radiation
2. Wind Speed
3. Temperature
4. Month value

Based on these input parameters the system predicts the value of the ozone and quality are displayed on the user interface.

Data Collection :

The Data Set for Air Quality Prediction is taken from the link as follows :

<https://drive.google.com/drive/folders/1C8fmxFlS3ZDw8dUDFQI44wIH9SStDAXl>

The Data Set contains 5 Columns in which 4 are independent values, which is responsible for the change in the quality and one dependent value, which depicts the quality of air.

Details about the air quality prediction is taken from the link :

<https://medium.com/tensorflow/air-cognizer-predicting-air-quality-with-tensorflow-lite-942466b3d02e>

Methodology :

Findings And Suggestions:

Conclusion:

So, with the help of Artificial Neural Network (ANN) and Python Programming we are able to deploy the model where node red is the development tool in IBM cloud and are able to predict the Quality of Air.