

ABSTRACT:

This paper deals with measuring Air Quality using MQ135 sensor along with Carbon Monoxide CO using MQ7 sensor. Measuring Air Quality is an important element for bringing lot of awareness in the people to take care of the future generations a healthier life. Based on this, Government of India has already taken certain measures to ban 'Single Stroke' and 'Two Stroke' Engine based motorcycles which are emitting high pollutions comparatively. We are trying to implement the same system using IoT platforms like Thingspeak or Cayenne, we can bring awareness to every individual about the harm we are doing to our environment. Already, New Delhi is remarked as the most pollution city in the world recording Air Quality above 300PPM. We have corrected the other papers where they have wrongly calibrated the sensor and wrongly projecting the PPM values. We have also used easiest platform like Thingspeak and set the dashboard to public such that everyone can come to know the Air Quality at the location where the system is installed. Also, we have reduced the cost of components used on comparing with the papers referred.

IMPORTANCE OF AIR QUALITY ANALYSIS:

improve air quality – monitoring helps to identify areas with poor air quality and the pollutants responsible for it. This information can be used to implement air pollution control measures to improve air quality.

monitor compliance with regulations – the main benefits of air quality monitoring is that it helps us to ensure that the air we breathe is safe.

monitor climate change – By monitoring these changes, air quality monitoring can help to identify the impact of climate change on air quality and take action to mitigate it.

support research and development – collected data on air quality is a unique source of inspiration for research and development of new pollution control technologies that have the potential to reduce emissions from industrial sources.

protect health – **why is air quality monitoring important?** Pollution has been linked to a range of health problems, including respiratory and cardiovascular diseases. Air quality monitoring can help to identify areas where the air is polluted and take action to protect public health.

METHODS OF AIR QUALITY ANALYSIS:

Air sampling is one of the most important and difficult steps in the surveillance of air pollution. These techniques are include,

- ❖ **Filtration**
- ❖ **Electrostatic precipitation**
- ❖ **Thermal precipitation**
- ❖ **Gravitational settling**
- ❖ **Centrifugal separation**
- ❖ **Impingement.**

PREVENTION:

Air pollution can be prevented by advocating the use of public transport and carpooling. It can also be controlled by avoiding wastage of electricity and practicing reuse and recycling of compatible products.

- ❖ Usage of public transport and carpooling
- ❖ Switching off the lights when they're not in use
- ❖ Reusing and recycling products
- ❖ Avoiding the burning of garbage and smoking
- ❖ Avoiding the use of firecrackers

PROGRAM:

```
#Define pollutants and their colors  
pollutants = ["co", "no", "no2", "o3", "so2", "pm2_5", "pm10",  
"nh3"]
```

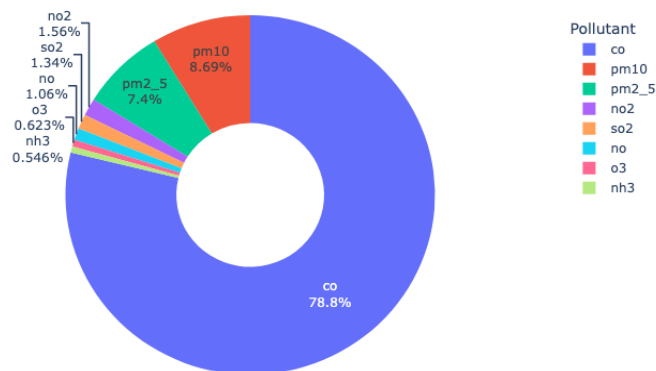
```

pollutant_colors = px.colors.qualitative.Plotly
# Calculate the sum of pollutant concentrations
total_concentrations = data[pollutants].sum()
# Create a DataFrame for the concentrations
concentration_data = pd.DataFrame({
    "Pollutant": pollutants,
    "Concentration": total_concentrations
})
# Create a donut plot for pollutant concentrations
fig = px.pie(concentration_data, names="Pollutant",
             values="Concentration",
             title="Pollutant Concentrations in Delhi",
             hole=0.4, color_discrete_sequence=pollutant_colors)
# Update layout for the donut plot
fig.update_traces(textinfo="percent+label")
fig.update_layout(legend_title="Pollutant")
# Show the donut plot
fig.show()

```

OUTPUT:

Pollutant Concentrations in Delhi



INPUT:

```
aux = pd.DataFrame()

aux['Y_test'] = Y_test

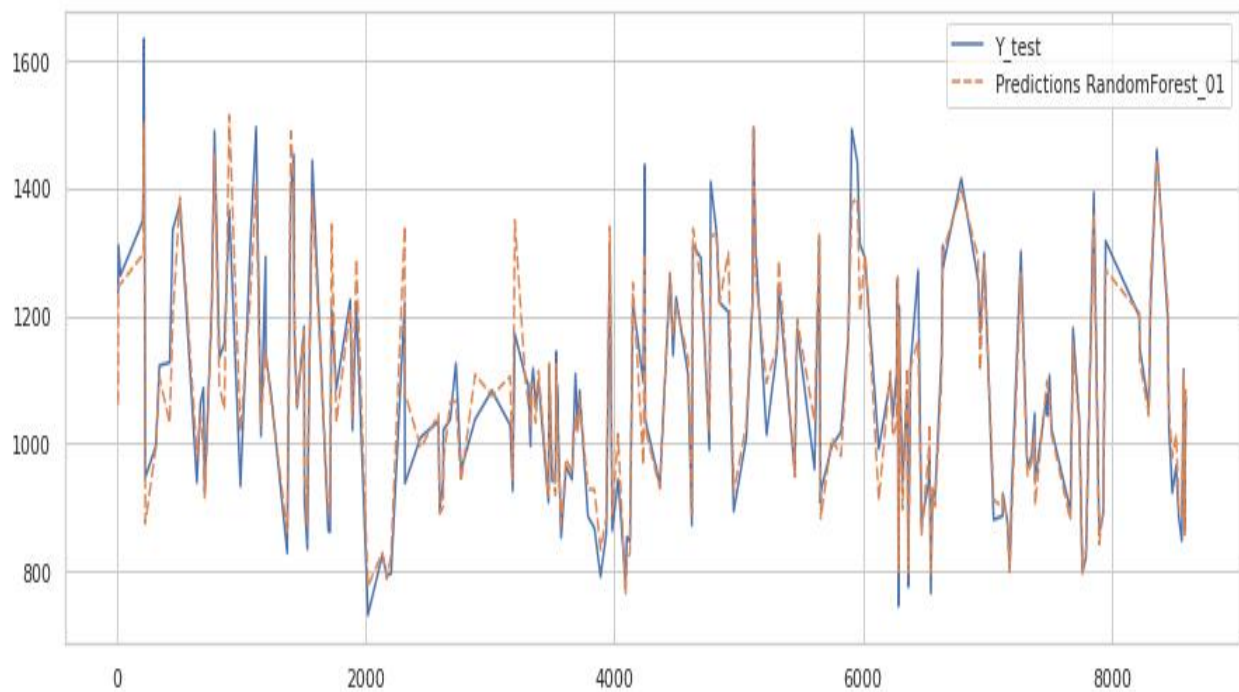
aux['Predictions RandomForest_01'] = pred_randomforest

plt.figure(figsize=(15,5))

sns.lineplot(data=aux.iloc[:200,:])

plt.show()
```

OUTPUT:



DATASET:

Location	status	AQI_US	PM2.5	PM10	Temp	Humid
Tanjore	moderate	93	32	69	32	57
Tirunelveli	good	42	10	36	32	61
Tripur	moderate	62	4	78	30	64
Thiruvanamalai	poor	115	41	79	32	57
Tuticorin	good	38	4	34	32	60
Vellore	good	50	12	28	31	66
Valparai	moderate	87	29	71	32	47
Trichinopoly	moderate	70	21	53	32	56