Predicting Air Quality Levels Using Advanced Machine Learning Algorithms for Environmental Insights.

SOURCE CODE:

Import pandas as pd

From sklearn.model\_selection import train\_test\_split

From sklearn.ensemble import RandomForestClassifier

Data = {

‘PM2.5’: [12, 35, 55, 110, 180, 250, 20, 70, 90, 300],

‘PM10’: [20, 60, 100, 160, 220, 400, 30, 120, 160, 500],

‘NO2’: [15, 40, 65, 100, 130, 180, 22, 88, 99, 190],

‘CO’: [0.3, 0.7, 1.2, 2.5, 3.5, 5.0, 0.4, 1.8, 2.2, 6.0],

‘O3’: [30, 50, 80, 120, 160, 200, 40, 100, 140, 220],

‘SO2’: [5, 15, 25, 40, 60, 100, 10, 30, 50, 120],

‘AQI\_Level’: [

‘Good’, ‘Moderate’, ‘Moderate’, ‘Unhealthy’, ‘Very Unhealthy’, ‘Hazardous’,

‘Good’, ‘Unhealthy’, ‘Very Unhealthy’, ‘Hazardous’

]

}

Df = pd.DataFrame(data)

X = df.drop(‘AQI\_Level’, axis=1)

Y = df[‘AQI\_Level’]

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)

Model = RandomForestClassifier(n\_estimators=100, random\_state=42)

Model.fit(X\_train, y\_train)

Print(“\nEnter pollutant values to predict Air Quality Index (AQI Level):”)

Pm25 = float(input(“PM2.5 (µg/m3): “))

Pm10 = float(input(“PM10 (µg/m3): “))

No2 = float(input(“NO2 (ppb): “))

Co = float(input(“CO (mg/m3): “))

O3 = float(input(“O3 (ppb): “))

So2 = float(input(“SO2 (ppb): “))

Input\_data = pd.DataFrame([[pm25, pm10, no2, co, o3, so2]], columns=X.columns)

Prediction = model.predict(input\_data)

Print(“\nPredicted Air Quality Level:”, prediction[0])

OUTPUT:

