

```

!pip install gradio scikit-learn pandas numpy

import pandas as pd
import numpy as np
from sklearn.ensemble import RandomForestRegressor
from sklearn.model_selection import train_test_split
import gradio as gr

np.random.seed(42)
data = pd.DataFrame({
    'PM2.5': np.random.randint(10, 300, 1000),
    'PM10': np.random.randint(20, 400, 1000),
    'NO2': np.random.randint(5, 100, 1000),
    'SO2': np.random.randint(2, 50, 1000),
    'CO': np.random.uniform(0.1, 5.0, 1000),
    'O3': np.random.randint(10, 120, 1000),
})

data['AQI'] = (
    0.5 * data['PM2.5'] +
    0.3 * data['PM10'] +
    0.1 * data['NO2'] +
    0.05 * data['SO2'] +
    10 * data['CO'] +
    0.05 * data['O3']
).astype(int)

X = data.drop('AQI', axis=1)
y = data['AQI']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

model = RandomForestRegressor(n_estimators=100, random_state=42)
model.fit(X_train, y_train)

def predict_air_quality(pm25, pm10, no2, so2, co, o3):
    input_data = pd.DataFrame([[pm25, pm10, no2, so2, co, o3]], columns=X.columns)
    prediction = model.predict(input_data)[0]
    return f"Predicted AQI: {round(prediction, 2)}"

interface = gr.Interface(
    fn=predict_air_quality,
    inputs=[
        gr.Slider(0, 500, label="PM2.5"),
        gr.Slider(0, 500, label="PM10"),
        gr.Slider(0, 200, label="NO2"),
        gr.Slider(0, 100, label="SO2"),
        gr.Slider(0.0, 10.0, label="CO"),
        gr.Slider(0, 200, label="O3")
    ],
    outputs="text",
    title="Air Quality Index Predictor",
    description="Enter pollutant levels to predict the Air Quality Index (AQI).")

interface.launch()

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Collecting gradio
  Downloading gradio-5.29.0-py3-none-any.whl.metadata (16 kB)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.11/dist-packages (1.6.1)
Requirement already satisfied: pandas in /usr/local/lib/python3.11/dist-packages (2.2.2)
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Downloading ffmpy-0.5.0-py3-none-any.whl (6.0 kB)

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Downloading pydub-0.25.1-py2.py3-none-any.whl (32 kB)

Installing collected packages: pydub, uvicorn, tomlkit, semantic-version, ruff, python-multipart, groovy, ffmpeg, aiofiles, starlette  
Successfully installed aiofiles-24.1.0 fastapi-0.115.12 ffmpeg-0.5.0 gradio-5.29.0 gradio-client-1.10.0 groovy-0.1.2 pydub-0.25.1 py  
It looks like you are running Gradio on a hosted Jupyter notebook. For the Gradio app to work, sharing must be enabled. Automatic

Colab notebook detected. To show errors in colab notebook, set debug=True in launch()

\* Running on public URL: <https://c3fd00613658eaa0b7.gradio.live>

This share link expires in 1 week. For free permanent hosting and GPU upgrades, run `gradio deploy` from the terminal in the working

## Air Quality Index Predictor

Enter pollutant levels to predict the Air Quality Index (AQI).

PM2.5	<input type="text" value="85"/>	↻
0	<input type="range" value="85"/>	500
PM10	<input type="text" value="120"/>	↻
0	<input type="range" value="120"/>	500
NO2	<input type="text" value="40"/>	↻
0	<input type="range" value="40"/>	200
SO2	<input type="text" value="20"/>	↻
0	<input type="range" value="20"/>	100
CO	<input type="text" value="1.5"/>	↻
0	<input type="range" value="1.5"/>	10
O3	<input type="text" value="60"/>	↻

output

Predicted AQI: 108.99

Flag