

The background of the slide features a scenic landscape of a waterfall. The waterfall is positioned centrally, cascading down a dark, rocky cliff. On either side of the cliff are large, green, grassy hills. The sky above is filled with soft, orange and grey clouds, suggesting either sunrise or sunset. The overall atmosphere is serene and natural.

PROJECT PRESENTATION

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Project Title: Environment Monitoring

Phase-3 : Development

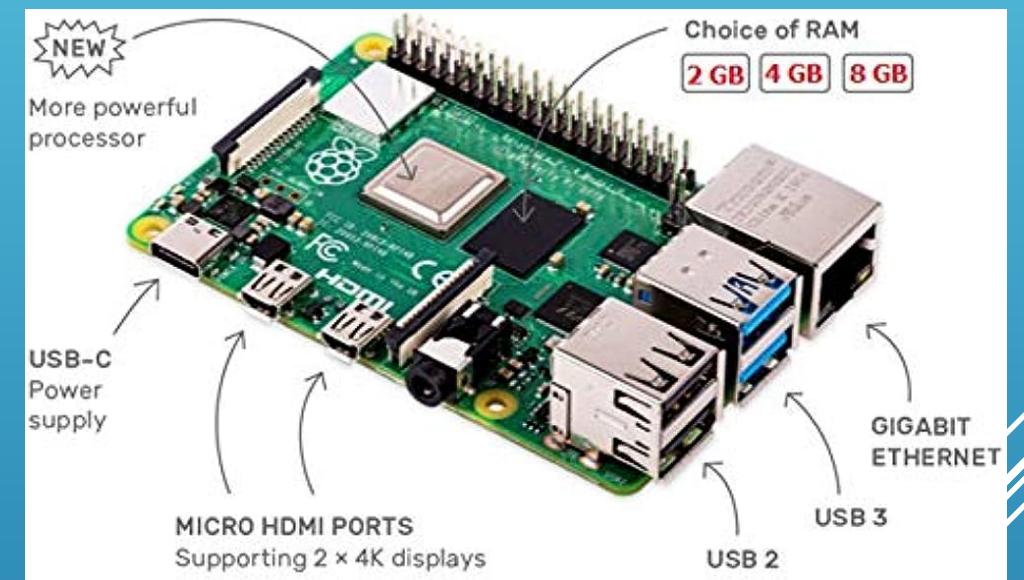
ABSTRACT

- The level of pollution has increased with times by lot of factors like the increase in population, vehicle use, industrialization and urbanization which results in harmful effects on human wellbeing by directly affecting health of the people. This project is based on the wireless sensor networks for collecting information about Environment.
- Develop an IOT Based Environmental Monitoring System, it can monitor the public Parks by using the Wi-Fi Technology. Internet of Things provide support for huge and accurate amount of data regarding the Environment. In this IOT project, we can monitor the pollution level from anywhere through computer or mobile.
- This system,we can forecast to avoid future pollution and can send the warning message to that particular polluted area.

The best solutions for IoT in Python

Python on Raspberry Pi

- The first thing that comes to mind about running Python on an IoT device is grabbing of Raspberry Pi from the table. Python is pre-installed in the operating system and the only thing left is for write own script for our desired output.
- We can control the I/O ports on the Raspberry Pi expansion bar. Fortunately, the board supports wireless communication (Bluetooth and WiFi), Ethernet, and we can also connect a monitor to the HDMI outputs, or a low energy consumption E-Ink 2.13" 250x122 display for Raspberry Pi.



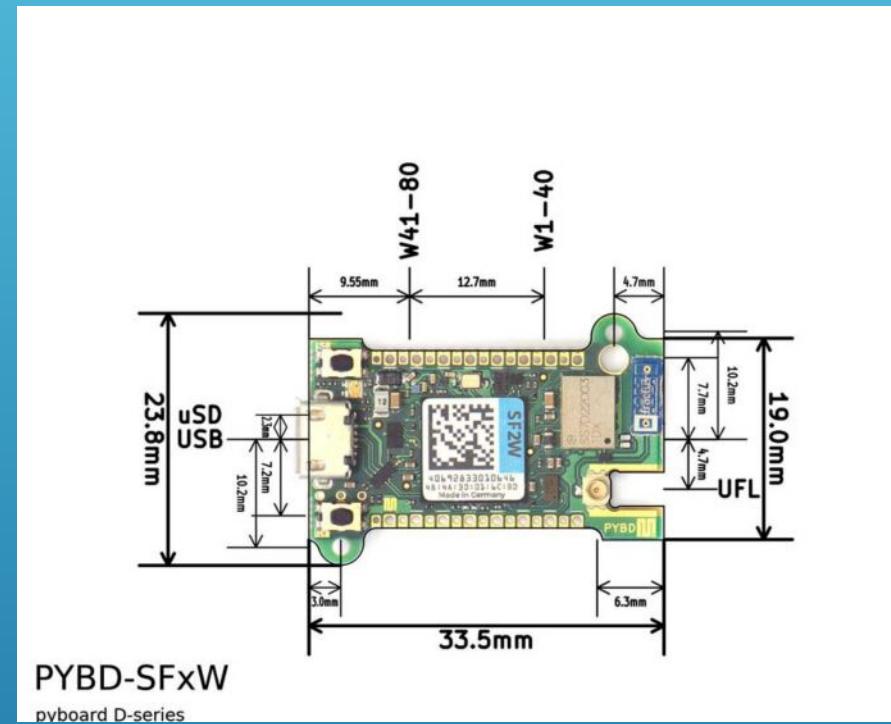
Python on PyBoard

- The next great solution for Python in IoT devices is the PyBoard with an STM32F405RG microcontroller.

The PyBoard is a compact and powerful electronics development board that runs Micro Python.

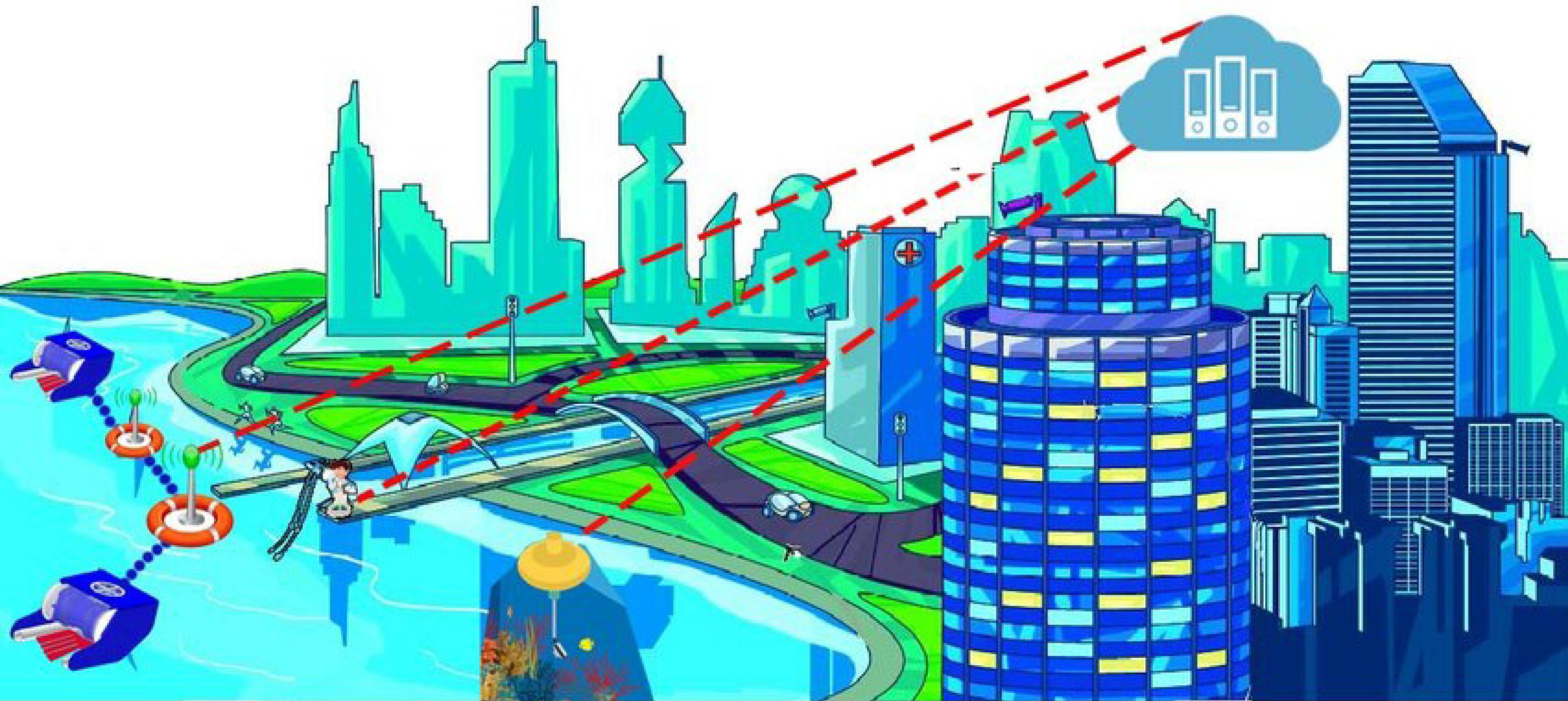
This works with Windows, Mac, and Linux.

It connects to our PC via USB giving you a USB flash drive to save Python scripts and a serial Python prompt (a REPL) for instant programming.



“SEMAR”

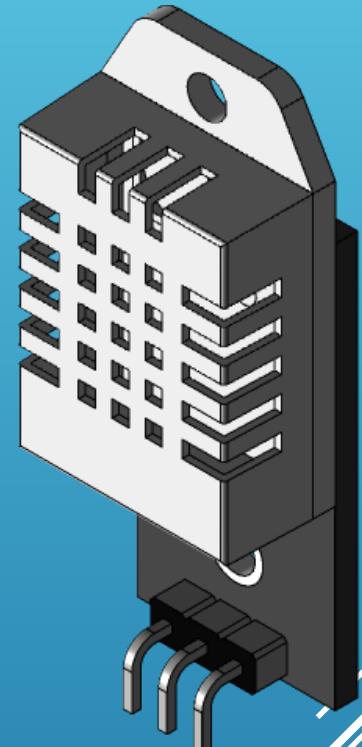
(Smart Environment Monitoring and Analytics in Real-Time System)



CAD Software in IOT Project

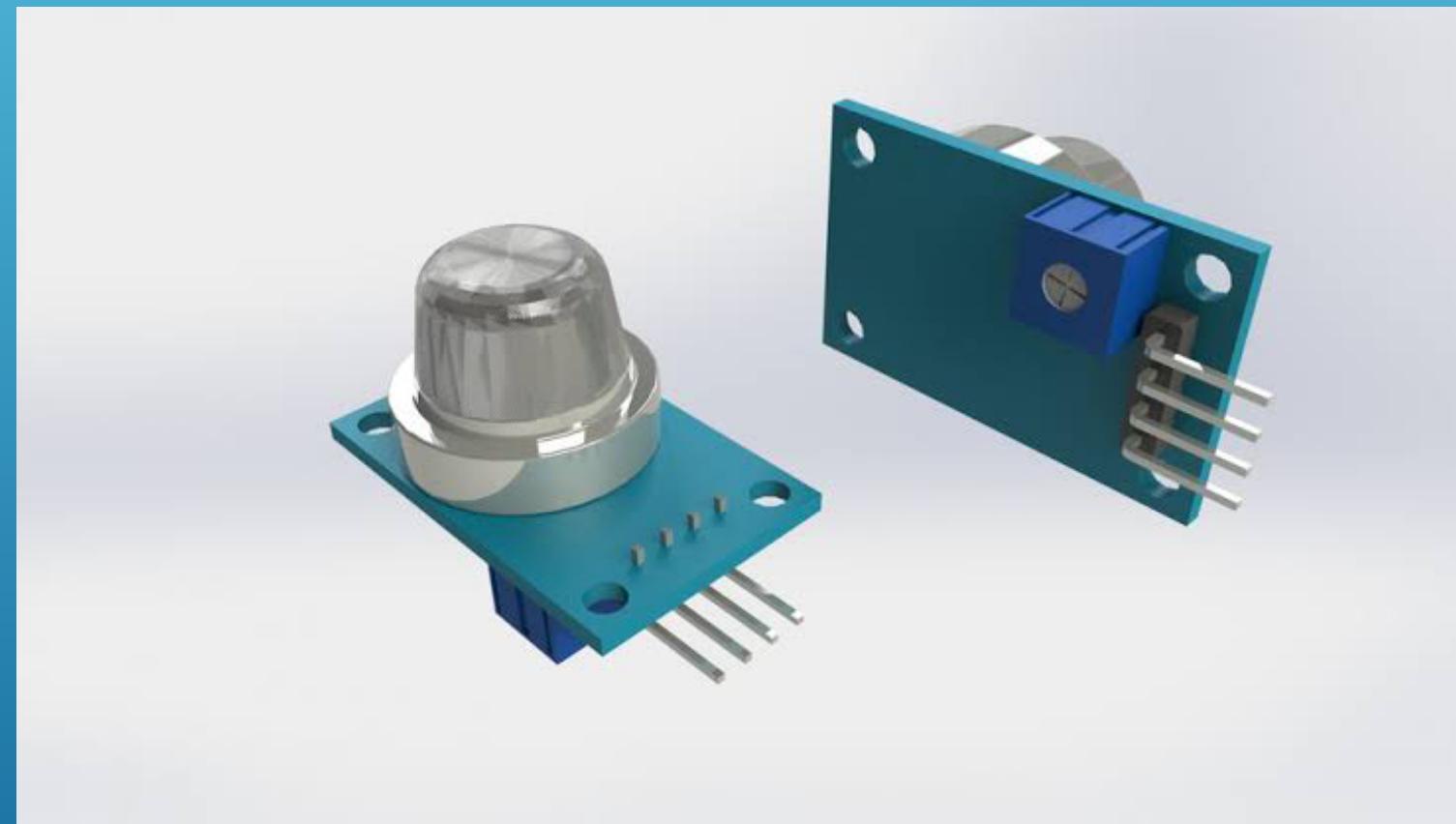
CAD Development in project

- 3D CAD software precisely represents and visualizes objects using a collection of points in three dimensions on the computer.
- In order to we are generate the actual model and sensors design using CAD designs, CAM uses numerical coding to run the machine that creates the product.
- A CAD is allows , our team to develop and save their own product designs, and program machines to create the actual component.

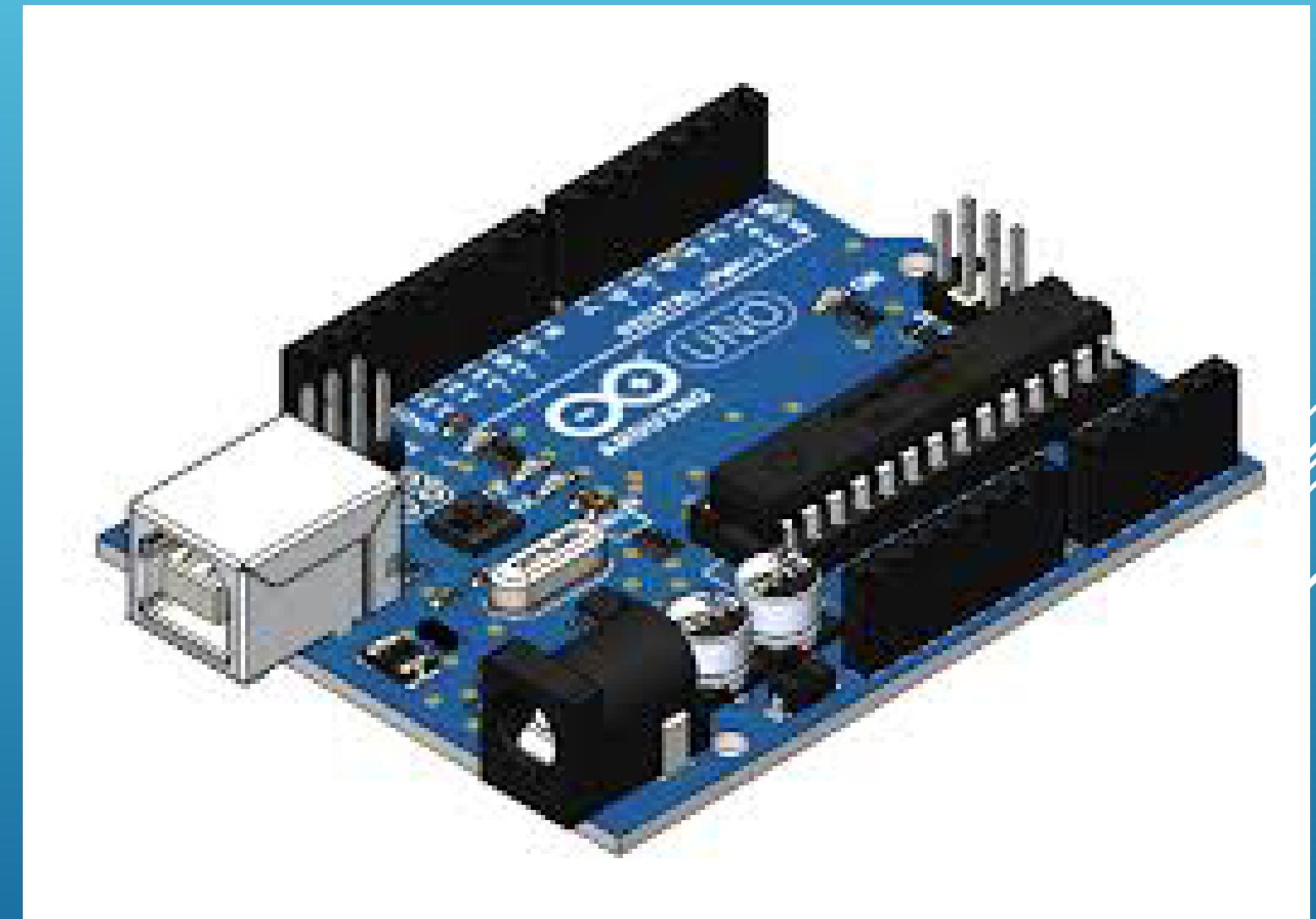


• HDT22/Temperature and
humidity Sensor

Development of Hardware designs using CAD



Gas Sensors



Arduino UNO

Developing visualizations

- You can create custom visualizations to meet your specific business needs.
- IBM Cognos Analytics allows developers to create and test custom visualizations

The Manage Visualizations capability allows users to control access rights to extensible visualizations for individual users, groups, and roles.

The Develop Visualizations capability allows users to develop extensible visualizations. Custom visualization code samples are available in the Samples Guide.

IBM Cognos Analytics

- *IBM Cognos Analytics is a powerful, comprehensive analytics platform designed*
- *It provides interactive dashboards with embedded visualizations that enable users to quickly understand complex data sets*

BENEFITS OF USING IBM COGNOS ANALYTICS



*Enhanced Decision
Making*



Improved Efficiency



Scalability



*Security &
Compliance*

Program

```
import Adafruit_DHT
import time
Import smtplib
from email.mime.text import MIMEText
from email.mime.multipart import
MIMEMultipart
from datetime import datetime

# Set the sensor type and GPIO pin
sensor = Adafruit_DHT.DHT11
pin = 4 # Change this to the GPIO pin you're
using

# Email configuration
smtp_server = 'smtp.example.com'
smtp_port = 587
smtp_username = 'your_email@example.com'
smtp_password = 'your_email_password'
sender_email = 'your_email@example.com'
recipient_email = 'recipient@example.com'
```

```
def read_sensor_data():
    humidity, temperature = Adafruit_DHT.read_retry(sensor, pin)
    return humidity, temperature

def send_email(subject, body):
    msg = MIME_Multipart()
    msg['From'] = sender_email
    msg['To'] = recipient_email
    msg['Subject'] = subject

    msg.attach(MIMEText(body, 'plain'))

    with smtplib.SMTP(smtp_server, smtp_port) as server:
        server.starttls()
        server.login(smtp_username, smtp_password)
        server.sendmail(sender_email, recipient_email, msg.as_string())

while True:
    humidity, temperature = read_sensor_data()

    if humidity is not None and temperature is not None:
        current_time = datetime.now().strftime('%Y-%m-%d %H:%M:%S')
        print(f'{current_time} Temperature: {temperature:.2f}°C, Humidity: {humidity:.2f}%')
```

```
# Data logging to a file
with open('environment-data.txt', 'a') as log_file:
    log_file.write(f'{current_time}, Temperature: {temperature:.2f}°C, Humidity:
{humidity:.2f}\n')

# You can add conditions to send email notifications based on specific criteria
if temperature > 30:
    subject = 'High Temperature Warning'
    body = f'Temperature is high: {temperature:.2f}°C'
    send_email(subject, body)

else:
    print('Failed to retrieve data. Check the sensor and wiring.')

# Adjust the sleep time as needed
time.sleep(300) # Sleep for 5 minutes before the next reading
```

CONCLUSION

Thus the IOT based Environmental Monitoring System has been designed and implemented. The Environmental

parameters successfully transmitted via ESP 8266 Wi-Fi module.

This project will protect the people from the pollutant gases. It is

more useful for the Industries to control the air pollution in the surrounding area. With the sensors which can sense the

gas density in high level. ESP 8266-12E module has inbuilt Arduino microcontroller.