

# Smart Water Fountain

Project Definition and Design Thinking

# Project Definition

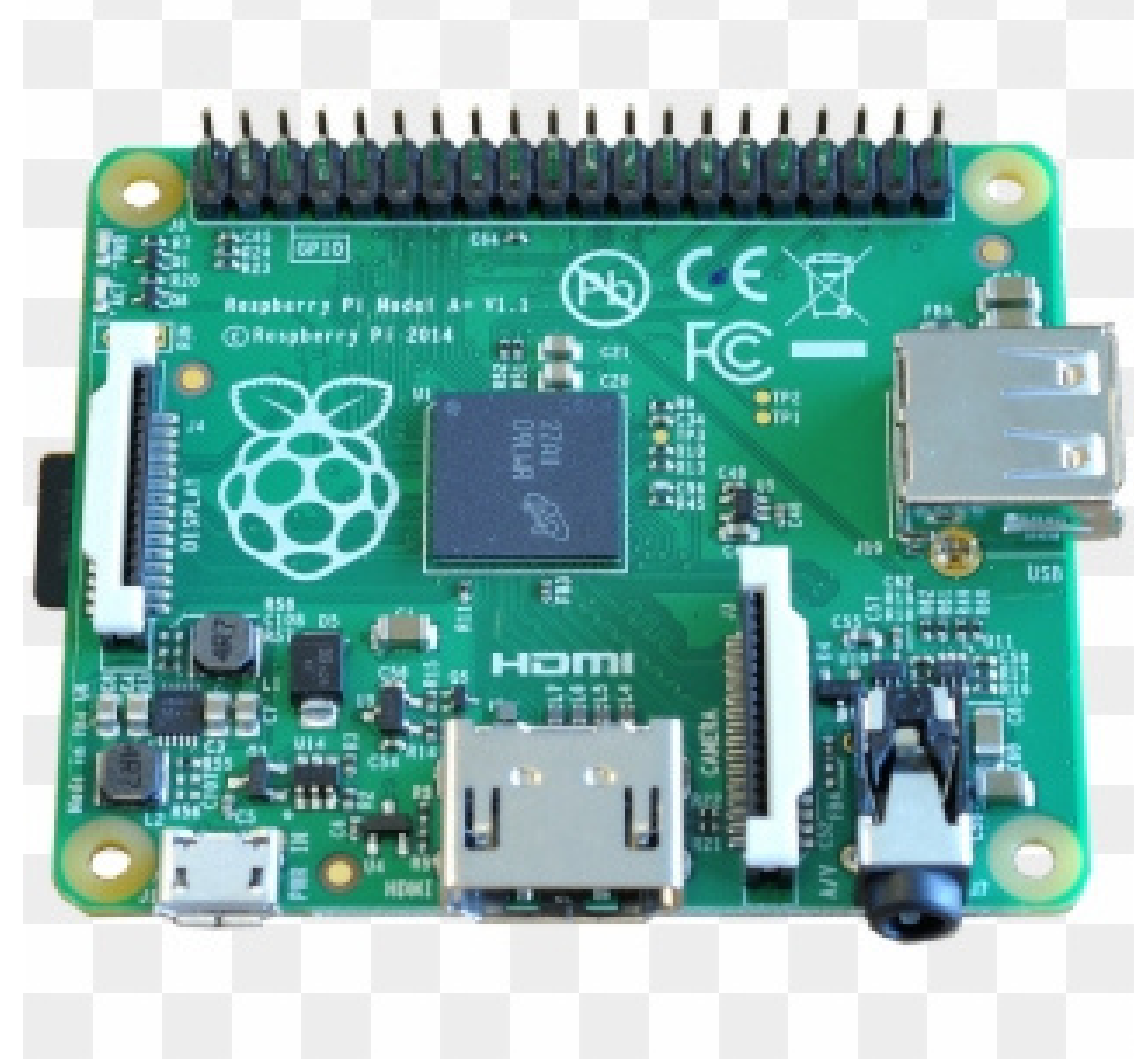
1. Problem Explain & Analysis .
2. The Smart Water Fountain project aims to develop an intelligent and environmentally sustainable water fountain system for public spaces .
3. Implementing IoT sensors devices .
4. The Python code to data acquisition, processing, and visualization tasks on the Raspberry Pi.
5. Real-time data updation & Testing .

# Required Hardware & Software Components :

1. IoT Sensors Devices.
2. Water Level Sensor.
3. Water Pressure Sensor.
4. Raspberry Pi 4 Model B.
5. Power supply.
6. Suitable Raspberry Pi OS.
7. GPIO Contorl.
8. Python code for Program.
9. Cloud AWS IoT .
10. Real-time Updation

## Hardware Step :

1. Connect the relay module to the Raspberry Pi using jumper wires, ensuring the correct GPIO connections.
2. Connect the power supply to the relay module and the water pump, making sure to match the voltage and current requirements.
3. Use the breadboard and various connectors to organize the wiring and ensure a tidy setup.

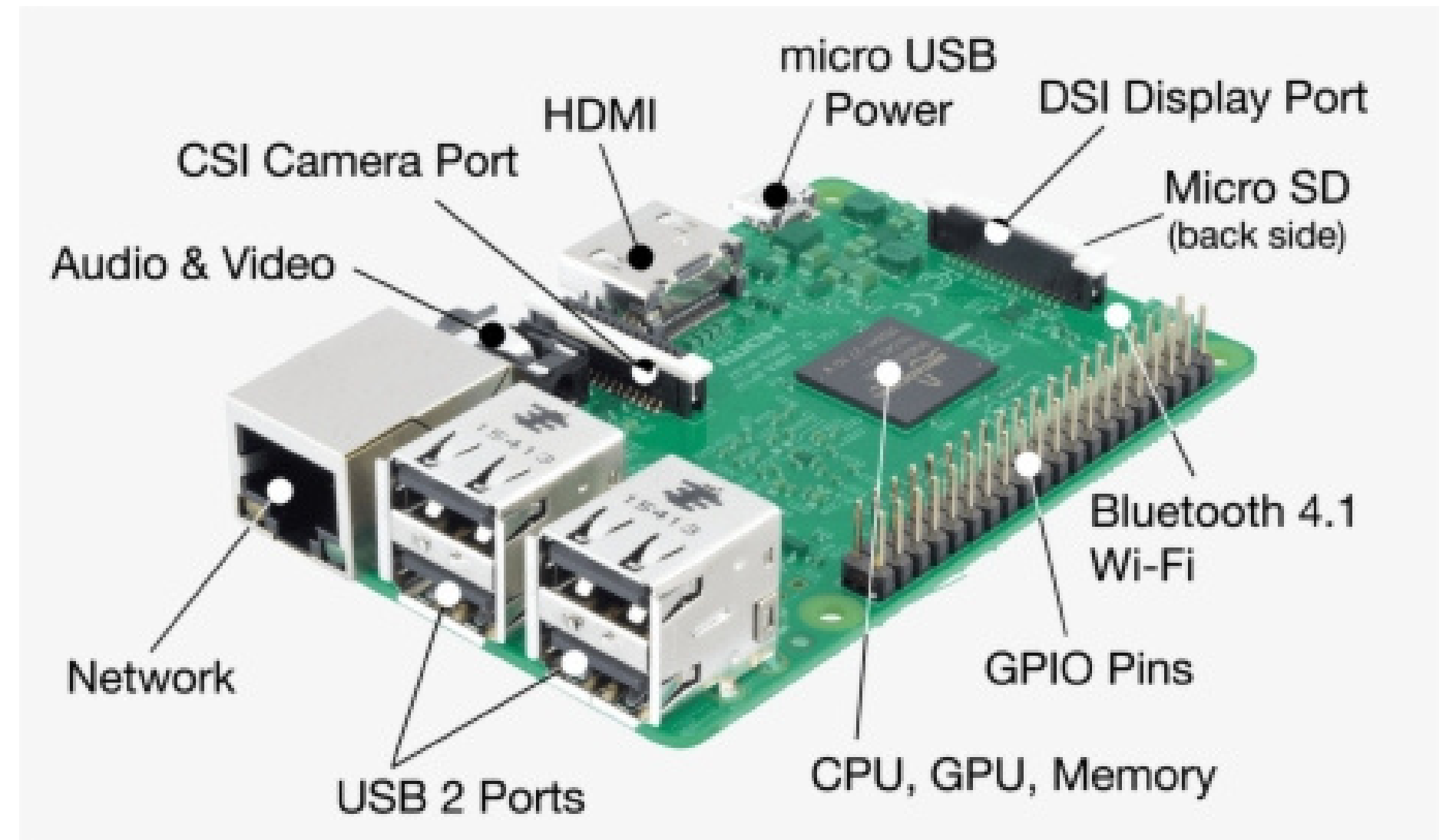


# Software Implementation:

1. Python script to control the GPIO pins connected to the relay module.
2. Implement a schedule or moisture sensor-based logic to trigger the water pump, ensuring the plants receive the appropriate amount of water at the right time.
3. Add error handling and safety measures to prevent overwatering or other issues that might harm the plants.
4. AWS IoT provides tools for registering, managing, and securing a diverse range of IoT devices at scale. This includes features for device provisioning, authentication, and management of device metadata.

# Introduction for Raspberry Pi :

Raspberry Pi is a series of affordable, credit card-sized single-board computers . Equipped with General-Purpose Input/Output (GPIO) pins and supporting various operating systems.utilized in diverse projects, ranging from basic computing tasks to complex DIY electronics, robotics, and Internet of Things (IoT) applications.



# Data Transfer in Raspberry Pi :

- Set up AWS IoT .
- Connect Sensors to Raspberry Pi .
- Install AWS IoT SDK for Python .
- Python script to read sensor data and send it .
- Run the Python Script .

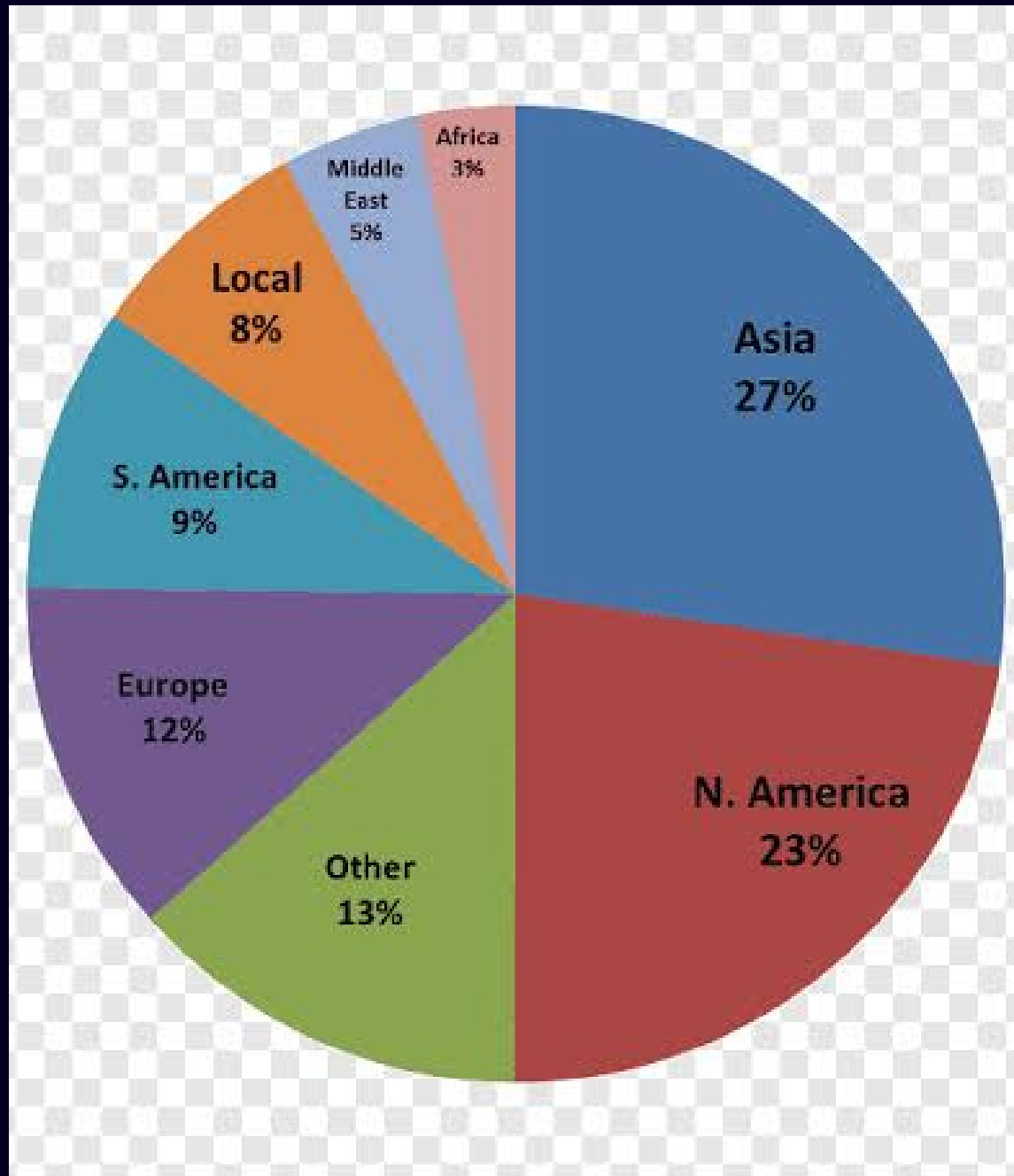
```
from AWSIoTPythonSDK.MQTTLib import  
AWSIoTMQTTClient  
  
# AWS IoT configuration  
host = "your-aws-iot-endpoint"  
root_ca_path = "path/to/root/ca"  
certificate_path = "path/to/certificate"  
private_key_path = "path/to/private/key"  
port = 8883 # standard MQTT port for AWS  
IoT  
  
myMQTTClient =  
AWSIoTMQTTClient("RaspberryPi")  
myMQTTClient.configureEndpoint(host, port)  
myMQTTClient.configureCredentials(root_ca_  
path, private_key_path, certificate_path)  
  
# Connect to AWS IoT  
myMQTTClient.connect()  
  
# Publish a message  
myMQTTClient.publish("myTopic", "Hello from  
Raspberry Pi", 1)  
  
# Disconnect from AWS IoT  
myMQTTClient.disconnect()
```





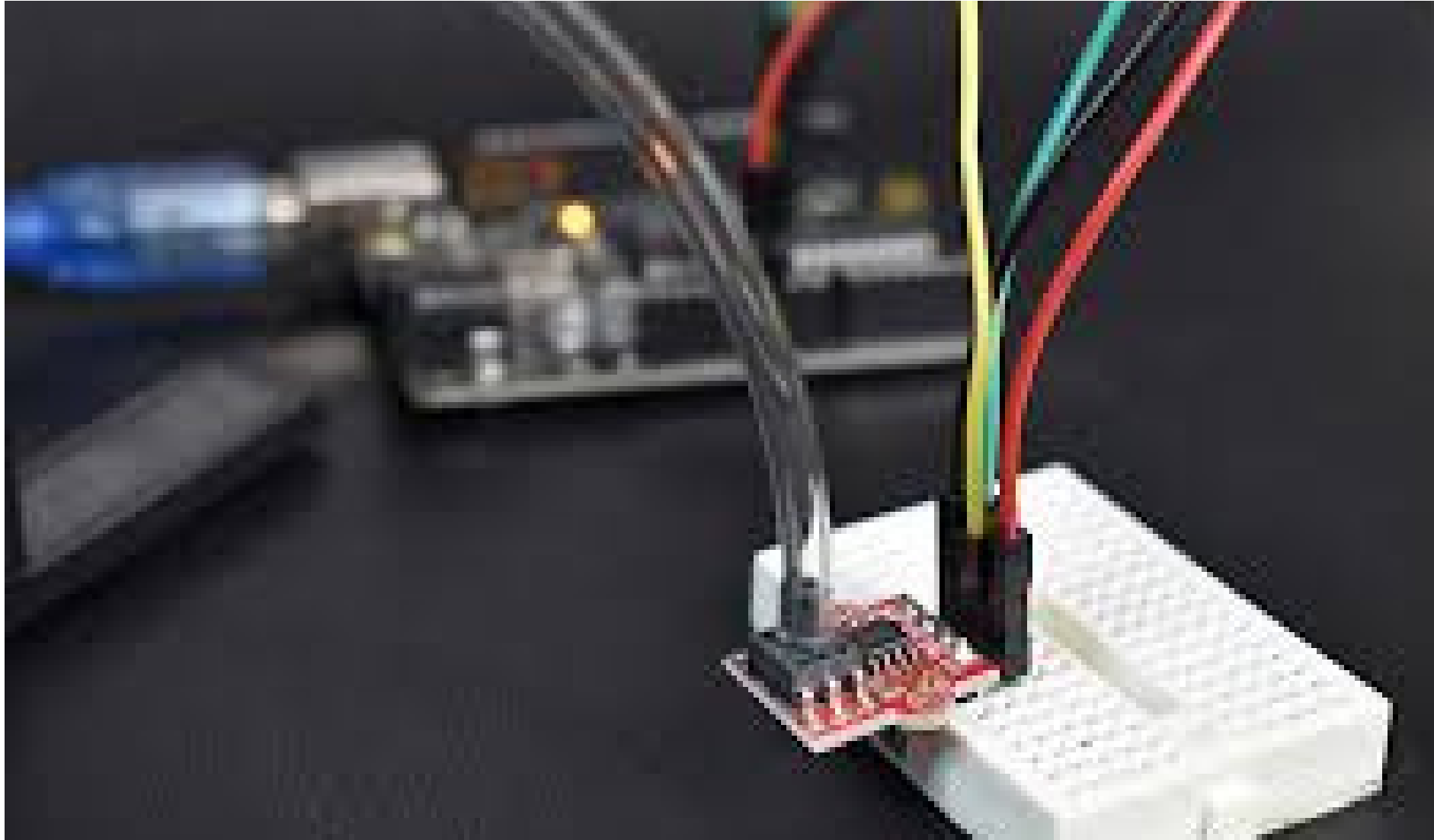
# Project Goals:

1. Monitor water usage patterns and promote efficient water consumption.
2. Control water flow based on real-time usage and demand.
3. Provide users with real-time data and access to control the fountain remotely.
4. Raise awareness about water conservation and environmental sustainability.
5. Demonstrate the capabilities of IoT and smart technology in promoting responsible water usage.



# Real-Time Analysis :

The real-time analysis of the public water fountain includes monitoring various parameters such as water pressure, usage patterns, temperature, and flow rate. sensor data, it assesses the frequency of activities like drinking, refilling water bottles, splashing, and wetting hands or faces.



**THANK YOU**