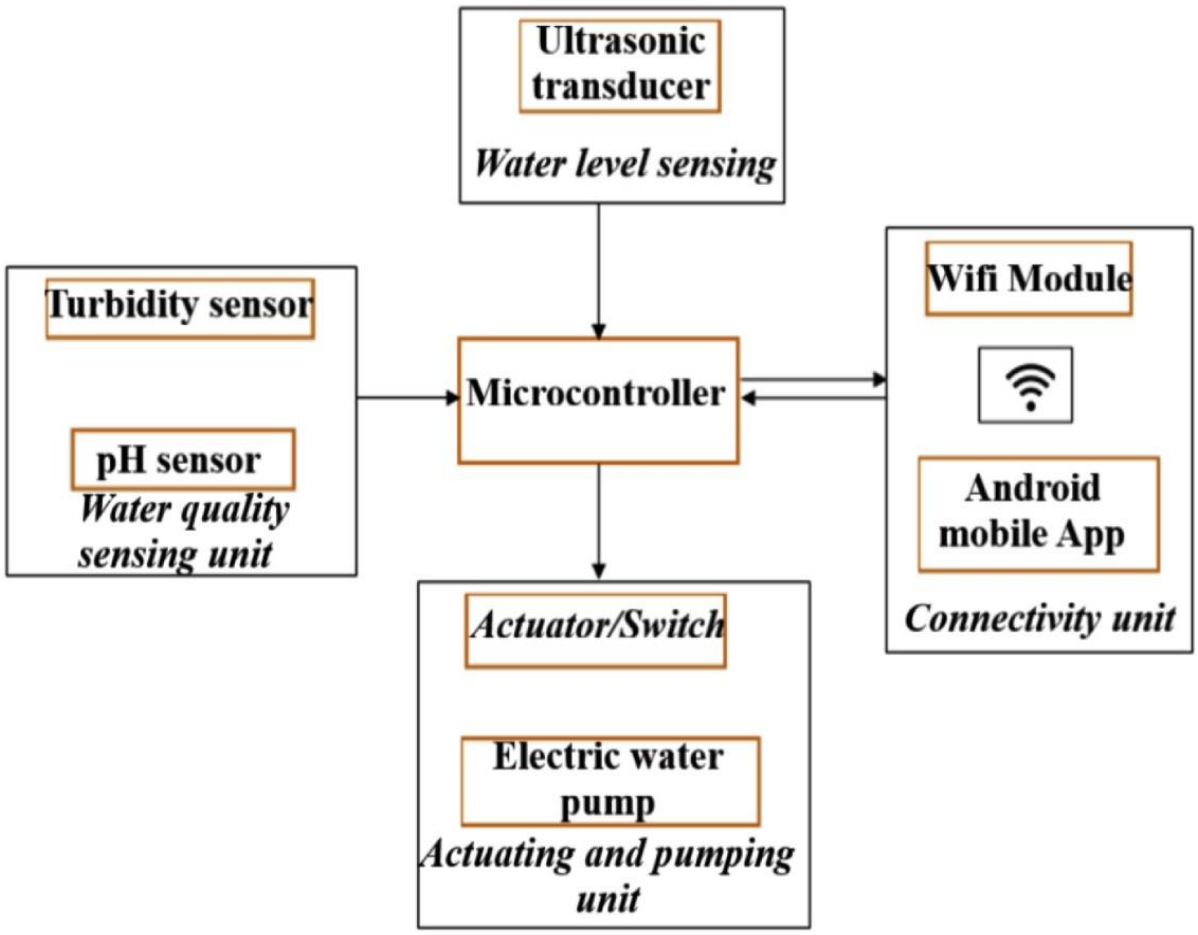
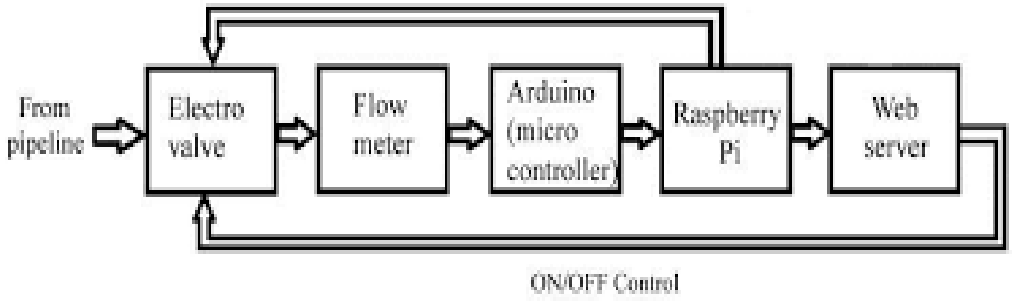
DOMAIN NAME: INTERNET OF THINGS

PROJECT NAME: SMART WATER SYSTEM

The introduction of web-based technological applications has revolutionized the way we approach critical global challenges, including sustainable resource management. In this context, the creation of a Smart Water System User Interface (UI) plays a pivotal role in promoting efficient water consumption and conservation. Leveraging web technologies such as HTML, CSS, and JavaScript, a Smart Water System UI empowers users with real-time data and interactive tools to monitor and manage their water usage. This not only enhances the transparency and accessibility of water consumption data but also fosters a sense of responsibility and awareness regarding this precious resource.

ARCHITECTURE:





FRONTEND APPLICATION USED:

1. USER INTERFACE:

- **HTML**

HTML, which stands for HyperText Markup Language, is the backbone of the World Wide Web. It serves as the fundamental building block for creating and structuring web content. HTML is a markup language that uses tags to define elements within a web page, such as headings, paragraphs, images, links, and more. These elements are essential in conveying the structure and presentation of web content, enabling web browsers to render and display it in a visually appealing and organized manner.

- **CSS**

Cascading Style Sheets, commonly known as CSS, play a pivotal role in the visual aesthetics and design of websites and web applications. CSS is a powerful styling language that works in conjunction with HTML to control the layout, formatting, and overall presentation of web content. It enables web developers and designers to define colors, fonts, spacing, and positioning, ensuring a consistent and visually appealing user experience across various devices and screen sizes. With CSS, the separation of content and design becomes possible, allowing for more efficient and flexible web development. CSS not only empowers the creation of beautiful and engaging web interfaces but also contributes to improved accessibility and user-friendliness.

- **JAVASCRIPT**

JavaScript is a versatile and widely-used programming language primarily known for its role in web development. It is a client-side scripting language, meaning it runs in a user's web browser, enabling dynamic and interactive functionality on websites. JavaScript allows developers to create responsive and engaging web applications, offering features like form validation, animations, and real-time updates without requiring constant interaction with the server.

2. **DATA VISUALIZATION:**

- **CHART.JS**

- Use libraries like Chart.js to create interactive charts and graphs that visually represent water consumption data.
- Display trends and patterns that help users understand their usage.

3. **USER ENGAGEMENT:**

- Add features like notifications and alerts to inform users of high consumption or water-saving tips.
- Provide a feedback mechanism for users to report leaks or water-saving initiatives.
- This can be done using HTML, CSS and JavaScript.

USES OF FLOW SENSORS AND LEVEL SENSORS IN SMART WATER SYSTEMS:

Flow sensors, level sensors, and temperature sensors play vital roles in a smart water system, helping to monitor, manage, and optimize various aspects of water usage, distribution, and quality. Here are the specific uses of these sensors in such a system:

Flow Sensors (Flowmeters):

Leak Detection: Flow sensors monitor water flow rates, and significant deviations from the normal flow rate can indicate leaks or abnormalities in the water distribution system. Early detection of leaks minimizes water wastage and property damage.

Water Consumption Monitoring: Flow sensors measure the volume of water consumed in real-time. This data is valuable for users, water utilities, and municipalities to track and manage water usage efficiently and accurately.

Irrigation Control: In agricultural and landscape irrigation systems, flow sensors help ensure the appropriate amount of water is delivered to crops and plants. This conserves water resources and promotes healthier vegetation.

Water Distribution Management: Flow sensors in water distribution networks help utilities balance supply and demand. By monitoring flow rates at different points, utilities can optimize the distribution of water and respond to variations in demand.

Level Sensors:

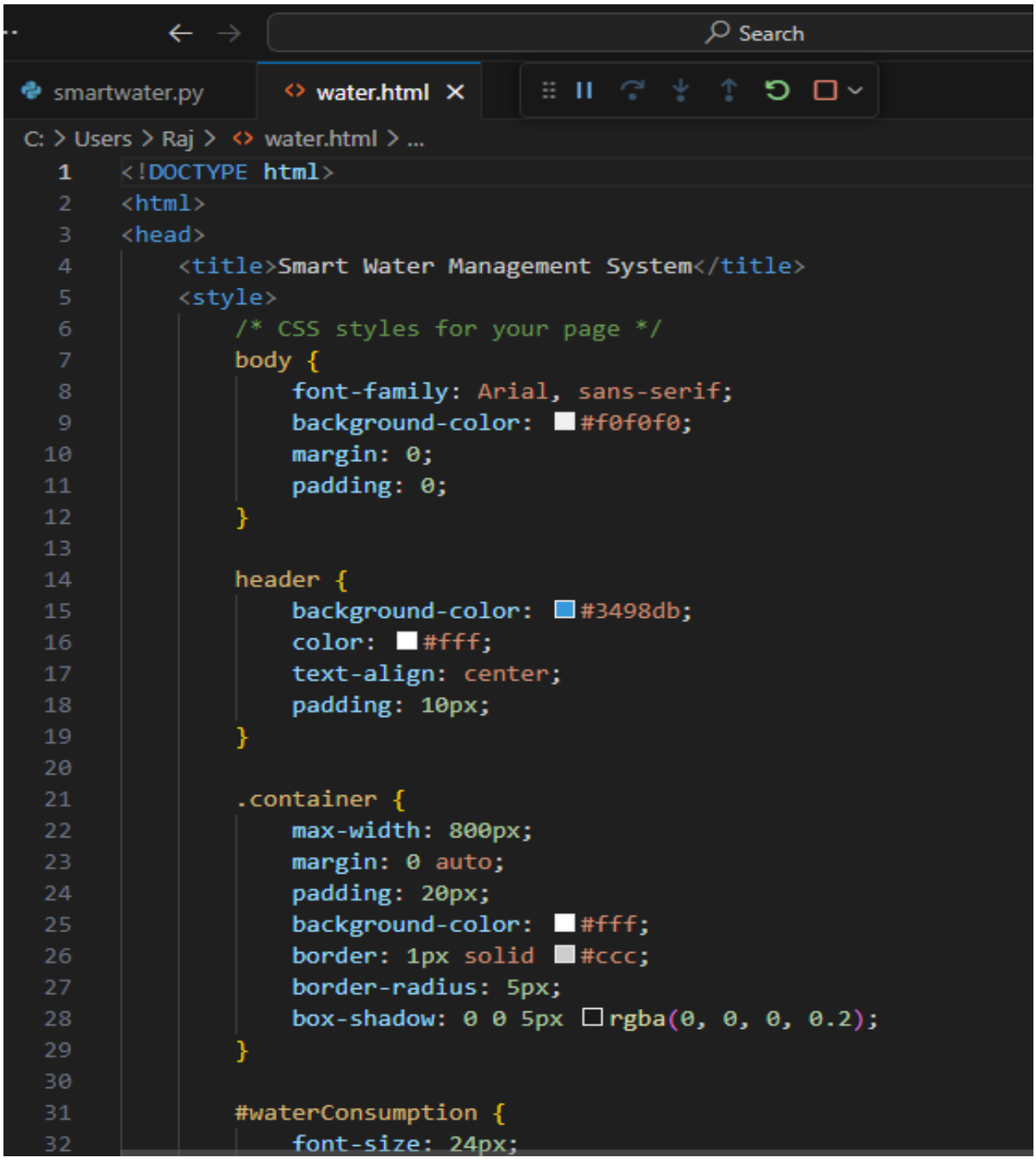
Tank and Reservoir Monitoring: Level sensors measure the water level in storage tanks, reservoirs, and water towers. This data is critical for maintaining a stable water supply, preventing overflows, and ensuring a reserve of water in case of emergencies.

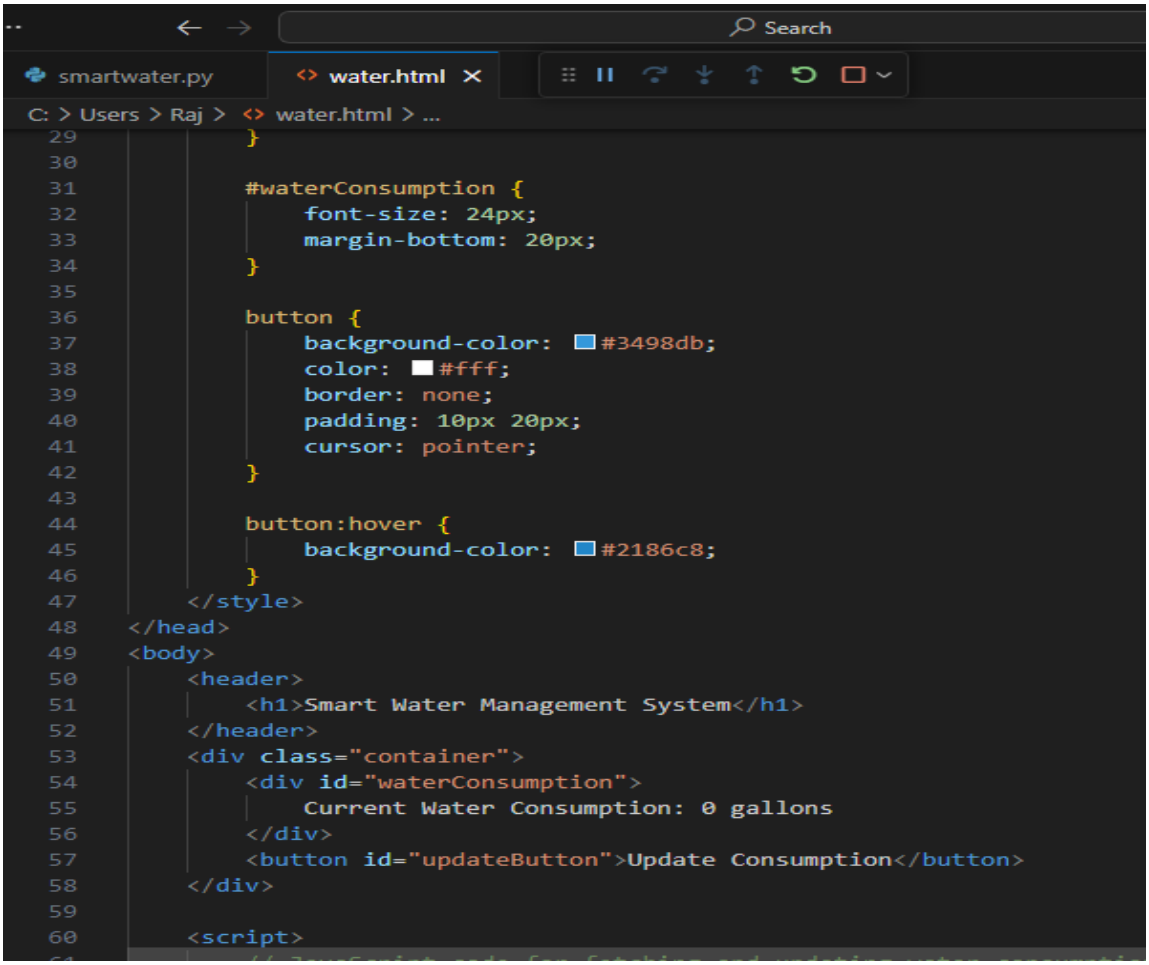
Stormwater Management: In urban areas, level sensors are used to monitor water levels in stormwater retention ponds and drainage systems. This helps prevent flooding and overflows during heavy rainfall.

Wastewater Treatment: Level sensors are employed in wastewater treatment plants to monitor and control water levels in various treatment stages. They ensure proper treatment and prevent system overflows.

CODING SNIPPET:

Water.html:(level sensor)

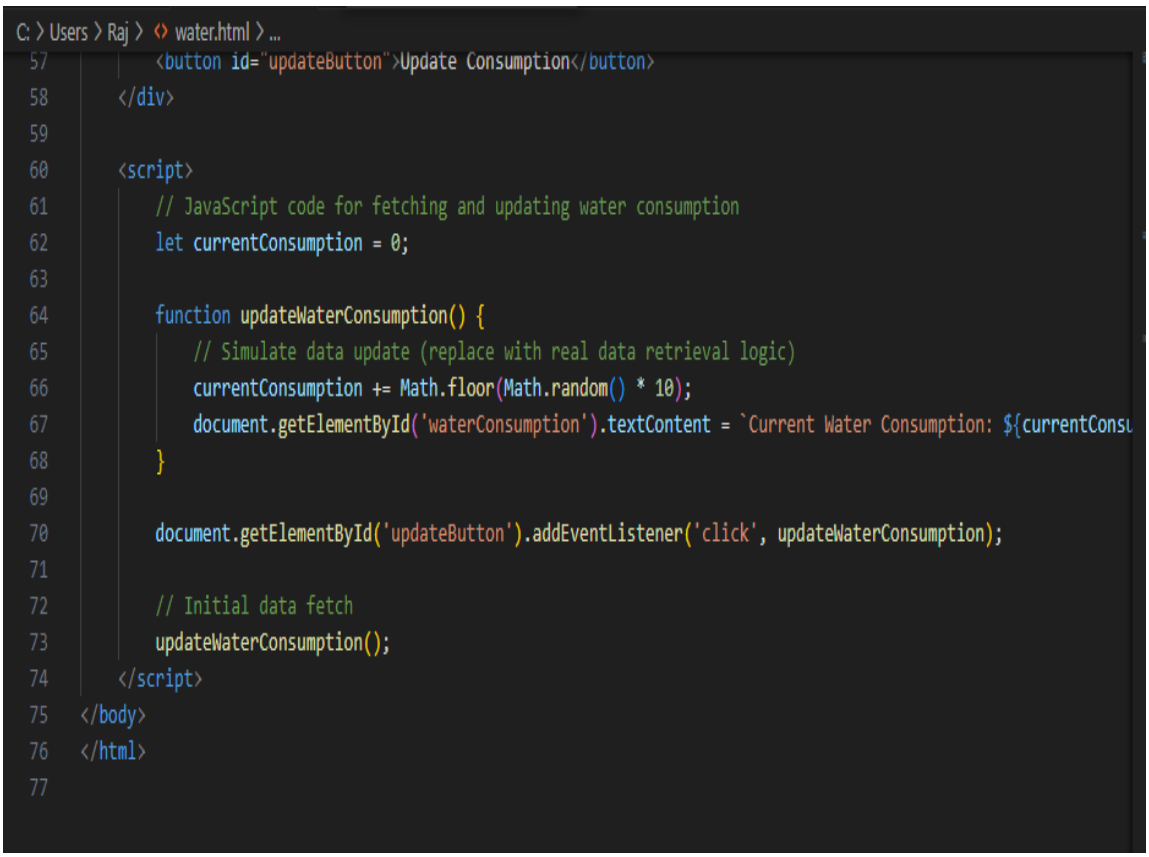



Search
smartwater.py
water.html
C: > Users > Raj > water.html > ...
}
#waterConsumption {
font-size: 24px;
margin-bottom: 20px;
}
button {
background-color: #3498db;
color: #fff;
border: none;
padding: 10px 20px;
cursor: pointer;
}
button:hover {
background-color: #2186c8;
}
</style>
</head>
<body>
<header>
<h1>Smart Water Management System</h1>
</header>

Current Water Consumption: 0 gallons

<button id="updateButton">Update Consumption</button>

<script>


C: > Users > Raj > water.html > ...
<button id="updateButton">Update Consumption</button>

<script>
// JavaScript code for fetching and updating water consumption
let currentConsumption = 0;
function updateWaterConsumption() {
// Simulate data update (replace with real data retrieval logic)
currentConsumption += Math.floor(Math.random() * 10);
document.getElementById('waterConsumption').textContent = `Current Water Consumption: ${currentConsu
}
document.getElementById('updateButton').addEventListener('click', updateWaterConsumption);
// Initial data fetch
updateWaterConsumption();
</script>
</body>
</html>

Flow.html(flow sensor):

smartwater.py flow.html

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```html
<!DOCTYPE html>
<html>
<head>
    <title>Flow Sensor</title>
    <style>
        /* Add your CSS styles here */
        body {
            font-family: Arial, sans-serif;
        }
        #sensorData {
            font-size: 24px;
        }
        #startButton, #stopButton {
            padding: 10px 20px;
            font-size: 16px;
            cursor: pointer;
        }
    </style>
</head>
<body>
    <h1>Flow Sensor Dashboard</h1>
    <p id="sensorData">Flow Rate: <span id="flowRate">0</span> L/min</p>
    <button id="startButton">Start</button>
    <button id="stopButton">Stop</button>

    <script>
        // JavaScript code to interact with the flow sensor
        let isRunning = false;
        let flowRate = 0;
        let intervalId;

        function startFlowSensor() {
```

Search

smartwater.py flow.html

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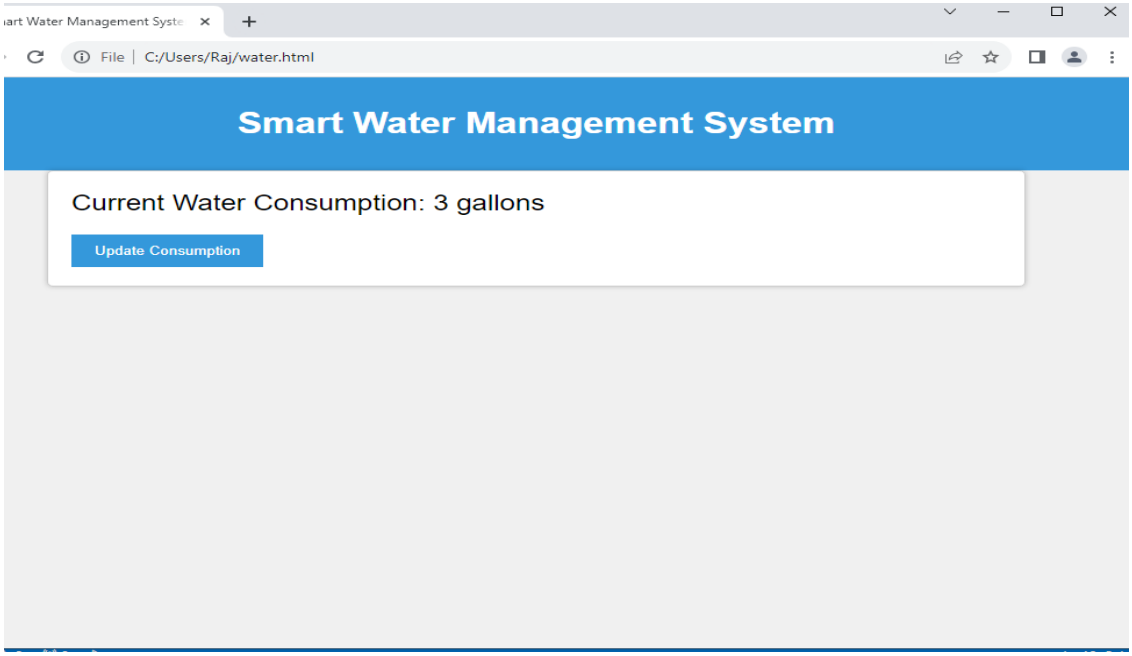
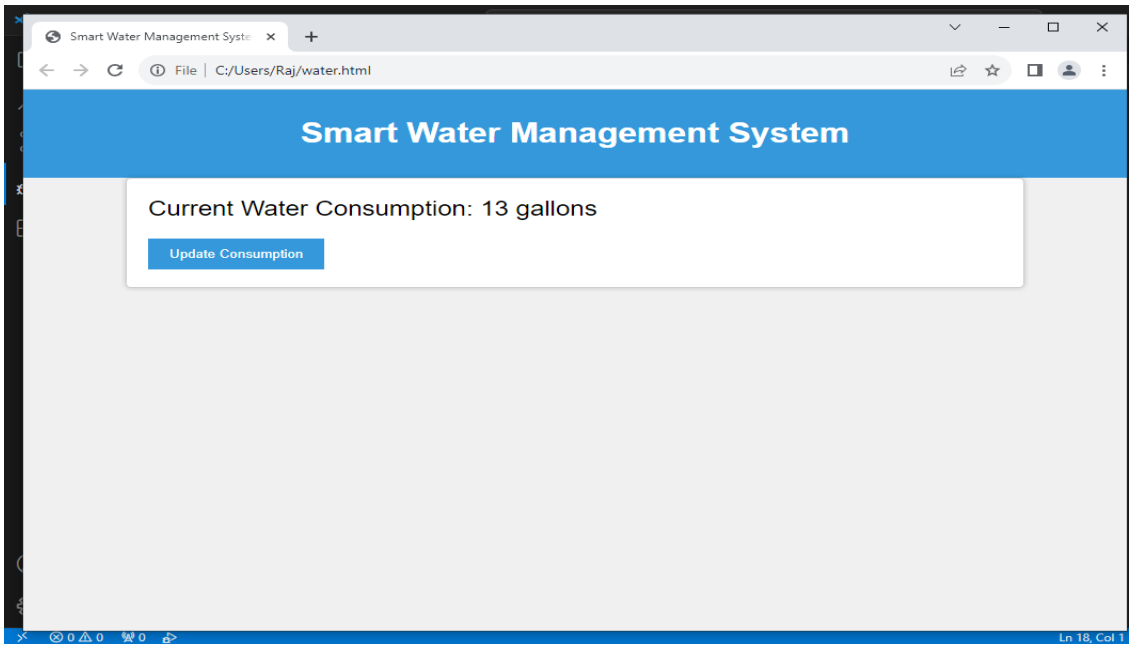
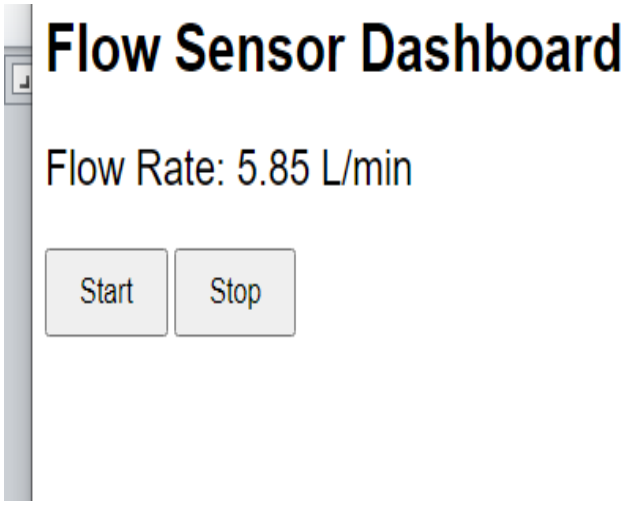
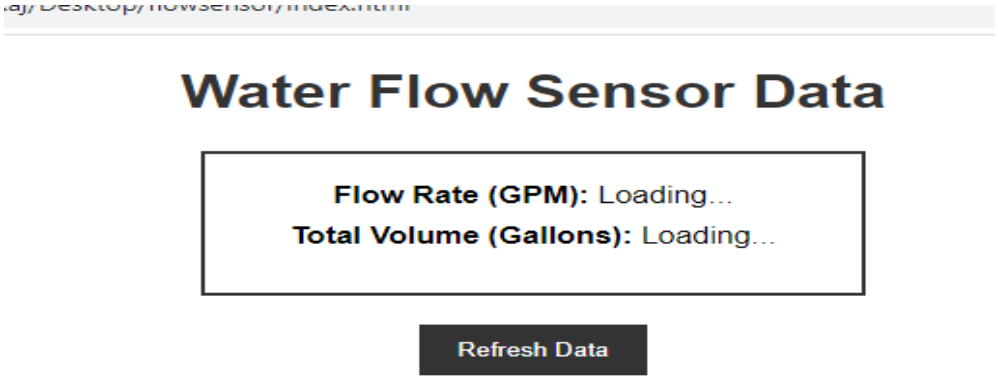
```html
        // JavaScript code to interact with the flow sensor
        let isRunning = false;
        let flowRate = 0;
        let intervalId;

        function startFlowSensor() {
            if (!isRunning) {
                intervalId = setInterval(updateFlowRate, 1000);
                isRunning = true;
            }
        }

        function stopFlowSensor() {
            clearInterval(intervalId);
            isRunning = false;
        }

        function updateFlowRate() {
            // Simulate flow rate data (replace with actual sensor data)
            flowRate = Math.random() * 10;
            document.getElementById("flowRate").innerText = flowRate.toFixed(2);
        }

        document.getElementById("startButton").addEventListener("click", startFlowSensor);
        document.getElementById("stopButton").addEventListener("click", stopFlowSensor);
    </script>
</body>
</html>
```

OUTPUT:


File | C:/Users/Raj/water.html
Smart Water Management System
Current Water Consumption: 3 gallons
Update Consumption


File | C:/Users/Raj/water.html
Smart Water Management System
Current Water Consumption: 13 gallons
Update Consumption


Flow Sensor Dashboard
Flow Rate: 5.85 L/min
Start
Stop


Water Flow Sensor Data
Flow Rate (GPM): Loading...
Total Volume (Gallons): Loading...
Refresh Data