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**THEME : SMART WATER FOUNTAINS**

**PHASE IV**

SUBMITTED BY : V.A.AKSHAYA

M.J.DEEPITA

B.DHANVARTHINI

S.KRITHIKA

Name of Institution : Government College Of Technology

Address of Institution : Government College Of Technology

Thadagam main road,

Coimbatore-641013.

District : Coimbatore State : TamilNadu Pin : 641013

Certainly! I can provide you with a step-by-step example of how to simulate a Smart Water

Fountain using the Wokwi simulator. In this example, we'll create a simple smart water fountain

system that can be controlled remotely via a web interface.

\*\*Components Needed:\*\*

1. \*\*Arduino Nano \*\*: This will be our microcontroller.

2. \*\*Water Pump\*\*: To pump water from a container to the fountain.

3. \*\*Relay Module\*\*: To control the water pump.

4. \*\*Ultrasonic Sensor (HC-SR04)\*\*: To detect water level in the fountain.

5. \*\*Wokwi Virtual Components\*\*: These are virtual components you can add in Wokwi for the

web interface and simulation.

\*\*Step 1: Create a Wokwi Account\*\*

1. Go to the Wokwi website (https://wokwi.com/) and create a free account.

\*\*Step 2: Set Up the Circuit in Wokwi Simulator\*\*

1. Click on the "Create a New Project" button.

2. In the Wokwi Circuit Editor, add the Arduino Nano , Water Pump, Relay Module, and

Ultrasonic Sensor to the canvas. Connect them appropriately with wires.

3. Add a "Button" and a "Range" element from the virtual components to the canvas. These will

serve as the web interface controls for your water fountain.

Here's a simplified circuit layout in text:

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Arduino Nano :

- Connect to Relay Module (Control Pin)

- Connect to Ultrasonic Sensor (Trigger and Echo Pins)

Relay Module:

- Connect to Water Pump

Ultrasonic Sensor :

- VCC to 5V

- GND to GND

- Trig to Arduino Nano

- Echo to Arduino Nano

Button (Virtual Component):

- Connect to Arduino Nano

Range (Virtual Component):

- Connect to Arduino Nano

```

\*\*Step 3: Write Arduino Code\*\*

1. Write the Arduino code for your Arduino Nano. You'll need to include libraries for the Ultrasonic Sensor and ESP8266 WiFi.

2. Set up a web server on your Arduino Nano that listens for requests. When the button is pressed via the web interface, the server should activate the water pump.

3. Use the ultrasonic sensor to monitor the water level in the fountain and update the web interface accordingly.

Here's a simplified example of the Arduino code:

# Define the code to run in the Arduino

arduino\_code = """

#include <Ultrasonic.h>

Ultrasonic ultrasonic(2, 3); // Trigger (pin 2), Echo (pin 3)

void setup() {

Serial.begin(9600);

}

void loop() {

float distance = ultrasonic.Ranging(CM);

Serial.println(distance);

// Send data to the computer (Python script)

Serial.print("D:");

Serial.println(distance);

delay(1000);

}

"""

# Upload and run the code in the simulation

simulation.run\_code(arduino\_code)

# Monitor the water level and send data to ThingSpeak

while True:

data = simulation.get\_serial\_data()

if data and data.startswith("D:"):

distance = float(data[2:])

print(f"Water level: {distance} cm")

# Send data to ThingSpeak

try:

response = requests.get(f"{thingspeak\_url}&field1={distance}")

if response.status\_code == 200:

print("Data sent to ThingSpeak successfully.")

else:

print("Failed to send data to ThingSpeak.")

except Exception as e:

print("Error sending data to ThingSpeak:", str(e))

\*\*Step 4: Simulation\*\*

1. Save your circuit and code in Wokwi.

2. Click the "Simulate" button to start the simulation.

3. You can interact with the virtual components in the simulation by clicking on the web interface controls (Button and Range).

With this setup, you can simulate a Smart Water Fountain that can be remotely controlled and monitors the water level in the fountain. This is a simplified example, and you can expand and customize it as needed for your project.