

Project Title: **IoT Water Fountain**

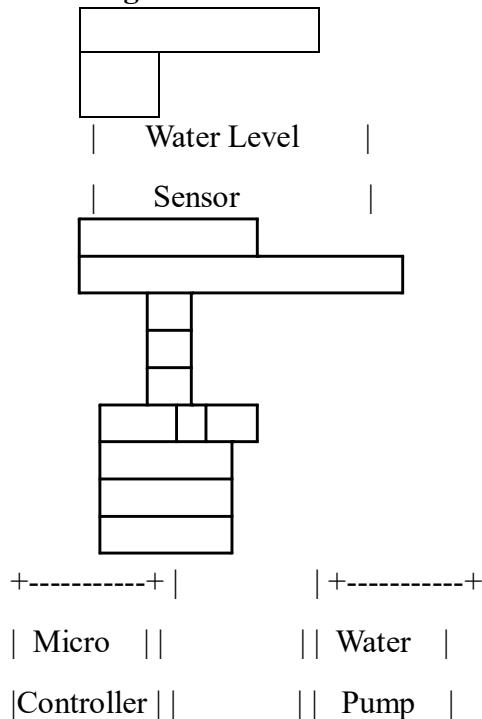
Project Title : WATER FOUNTAIN MANAGEMENT SYSTEM

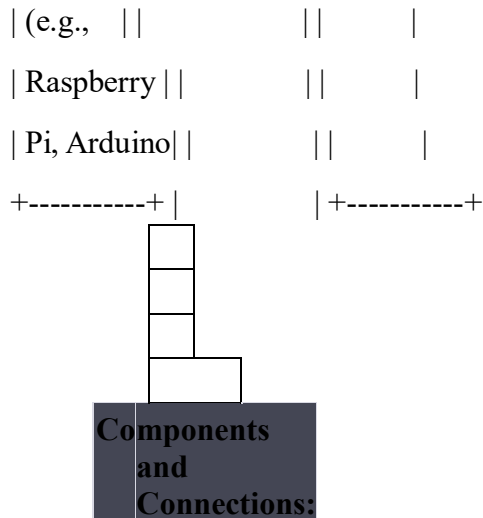
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Project Overview:

The IoT Water Fountain project is a modern and innovative approach to water fountain management and control. It leverages Internet of Things (IoT) technology to create an automated and smart water fountain system. This system not only offers aesthetic appeal but also provides real-time monitoring, control, and conservation of water resources.

Circuit Diagram for IoT Smart Water Fountain:





Water Level Sensors:

Connect the water level sensor to one of the microcontroller's GPIO pins to read water level data.

Microcontroller (e.g., Raspberry Pi or Arduino):

- Connect the microcontroller to the water level sensor.
- Connect the microcontroller to the water pump to control its operation.
- Ensure proper power connections for the microcontroller.

Water Pump:

- Connect the water pump to the microcontroller to control its operation.
- Ensure that the power supply for the water pump is adequate.

Coding and programming:

```
import RPi.GPIO as GPIO
```

```
Import time
```

```
Import paho.mqtt.client as mqtt
```

```
# GPIO setup
```

```
GPIO.setmode(GPIO.BCM)
```

```
Water_pump_pin = 17
```

```
GPIO.setup(water_pump_pin, GPIO.OUT)
```

```
# MQTT setup
```

```
Mqtt_broker = "your_broker_address"
```

```
Mqtt_topic = "water_fountain/control"
```

```
Client = mqtt.Client()
```

```
# Callback for MQTT message received
```

```
Def on_message(client, userdata, message):
```

```
    If message.payload.decode() == "on":
```

```
        GPIO.output(water_pump_pin, GPIO.HIGH)
```

```
    Else:
```

```
        GPIO.output(water_pump_pin, GPIO.LOW)
```

```
# Connect to MQTT broker
```

```
Client.on_message = on_message
```

```
Client.connect(mqtt_broker)
```

```
Client.subscribe(mqtt_topic)
```

```
Client.loop_start()
```

```
Try:
```

```
    While True:
```

```
        # Read water level and temperature sensors
```

```
        Water_level = ... # Read water level from sensor
```

```
        Temperature = ... # Read temperature from sensor
```

```
        # Your logic for controlling the water pump based on sensor readings
```

```
        If water_level < threshold:
```

```
            # Water level is too low, turn off the pump
```

```
            GPIO.output(water_pump_pin, GPIO.LOW)
```

```

# Publish sensor data to the MQTT broker
Client.publish("water_fountain/data", f"Water Level: {water_level}, Temperature:
{temperature}")

# Add any other functionality or logic here

Time.sleep(5) # Adjust the interval as needed

except KeyboardInterrupt:

GPIO.cleanup()

```

Data transmission:

Data transmission in an IoT smart water fountain project involves sending data from the fountain's sensors to a central server or cloud platform and receiving control commands or updates from a remote user interface (e.g., a mobile app or web interface).

Coding:

```

import paho.mqtt.client as mqtt

# MQTT setup

Mqtt_broker = "your_broker_address"

Mqtt_topic_sensor = "water_fountain/data"

Mqtt_topic_control = "water_fountain/control"


def on_connect(client, userdata, flags, rc):

    print("Connected with result code " + str(rc))

    client.subscribe(mqtt_topic_control)


def on_message(client, userdata, message):

    payload = message.payload.decode()

    # Handle control commands (e.g., pump control) based on payload


client = mqtt.Client()

```

```
Client.on_connect = on_connect
```

```
Client.on_message = on_message
```

```
Client.connect(mqtt_broker, 1883, 60)
```

Try:

While True:

```
# Read sensor data and publish it
```

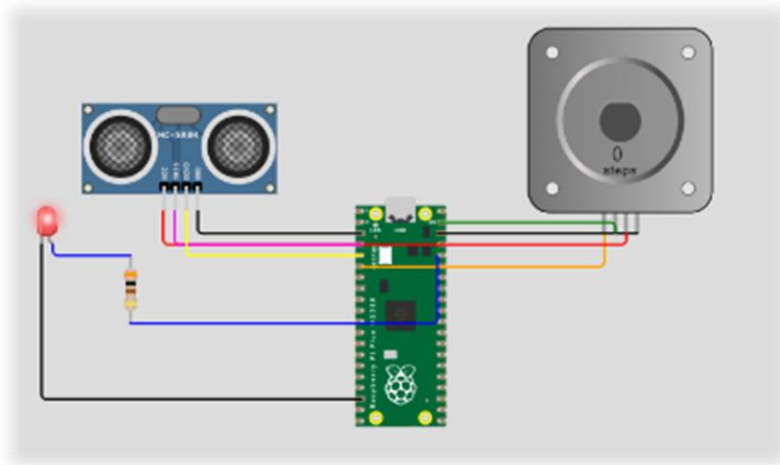
```
Sensor_data = "Water level: 50%, Temperature: 25°C" # Replace with actual data
```

```
Client.publish(mqtt_topic_sensor, sensor_data)
```

Except KeyboardInterrupt:

```
Client.disconnect()
```

Diagram:



Appendix:

IoT Smart Water Fountain

In this appendix, we provide additional information, technical specifications, and references related to the IoT smart water fountain.

Coding:

```
#include <ESP8266WiFi.h>
```

```
#include <WiFiClient.h>
```

```
#include <ESP8266WebServer.h>
```

```
Const char *ssid = "YourWiFiSSID";
Const char *password = "YourWiFiPassword";

Int pumpPin = D1; // Pin connected to the water pump relay
Bool pumpState = false;

ESP8266WebServer server(80);

Void setup() {
  pinMode(pumpPin,
  OUTPUT);
  digitalWrite(pumpPin, LOW);
  // Connect to Wi-Fi

  WiFi.begin(ssid, password);
  While (WiFi.status() != WL_CONNECTED) {
    Delay(1000);
    Serial.println("Connecting to WiFi...");
  }
  Serial.println("Connected to WiFi");

  // Define server routes
  Server.on("/", HTTP_GET, handleRoot);
  Server.on("/control", HTTP_POST, handleControl);

  Server.begin();
}
```

```
Void loop() {
```

```
    Server.handleClient();
```

```
}
```

```
Void handleRoot() {
```

```
    String html = "<html><body>";
```

```
    Html += "<h1>IoT Smart Water Fountain</h1>";
```

```
    Html += "<p>Pump is " + String(pumpState ? "ON" : "OFF") + "</p>";
```

```
    Html += "<form method='post' action='/control'>";
```

```
    Html += "<input type='submit' value='Toggle Pump'>";
```

```
    Html += "</form></body></html>";
```

```
    Server.send(200, "text/html", html);
```

```
}
```

```
Void handleControl() {  pumpState =
```

```
!pumpState;  digitalWrite(pumpPin, pumpState ?
```

```
HIGH : LOW);  server.send(200, "text/plain",
```

```
"Pump state toggled");
```

```
}
```

Conclusion:

The IoT smart water fountain is a practical, efficient, and environmentally-friendly solution for managing water features. It offers convenience, remote control, and real-time monitoring while promoting water conservation and aesthetic appeal.

