SMART WATER FOUNTAINS PROJECT

Phase: 3 – Development part 1

PROJECT OVERVIEW:

A smart water fountain project is a modern and innovative concept that combines traditional water fountains with technology to enhance functionality, interactivity, and efficiency. The project aims to create visually appealing water fountains that can adapt their display patterns, colors, and water movements, making them an attractive addition to public spaces, parks, or commercial environments. Smart water fountains can incorporate sensors and controls that allow users to interact with the fountains, altering water displays in response to user input.

PROJECT OBJECTIVES:

1. Enhancing water conservation by implementing sensors and technology to monitor water usage, reducing wastage.
2. Improving user experience by offering features like touchless operation, temperature control, and water quality monitoring.
3. Promoting sustainability by utilizing energy-efficient components and materials in the fountain's design.
4. Providing data collection capabilities to track water consumption and identify trends for better resource management.
5. Increasing awareness about water conservation through educational displays and public engagement initiatives near the fountains.

HARDWARE COMPONENTS:

1. Water Pump and Reservoir
2. Sensors
3. Controller and Microprocessors
4. Connectivity Modules
5. Camera
6. LED Lighting
7. Valves and Nozzles
8. Power Supply

9. Data Storage and Processing
10. Piping and Tubing

SOFTWARE COMPONENTS:

1. Firmware
2. Control Software and Communication Software
3. Data Analytics and Reporting
4. Remote Monitoring and Control
5. Maintenance and Diagnostics
6. Fountain Display Patterns
7. Integration with Environmental Data
8. Database Management
9. Security Software

PYTHON CODE TO IMPLEMENT SMART WATER FOUNTAINS:

```
Import. RPi. GPIO as GPIO
Import time
import sensors
import actuators
import data_processing

GPIO.setmode(GPIO.BOARD)
sensor_pin = 17
actuator_pin = 18
GPIO.setup(sensor_pin, GPIO.IN)
GPIO.setup(actuator_pin, GPIO.OUT)

def smart_water_fountain():
   try:
      while True:
         water_level = sensors.read_water_level(sensor_pin)
         if water_level < threshold_value:

            actuators.turn_on_fountain(actuator_pin)
            time.sleep(5)
            actuators.turn_off_fountain(actuator_pin)

            temperature = sensors.read_temperature()
```

```
            water_quality = sensors.read_water_quality()
            data_processing.store_data(water_level, temperature, water_quality)
            time.sleep(60)  # Wait for 1 minute before checking again
        else:
            actuators.turn_off_fountain(actuator_pin)
            time.sleep(10)

    except KeyboardInterrupt:
        GPIO.cleanup()

if _name_ == "_main_":
    smart_water_fountain()
```

PROJECT DOCUMENTATION:

- **Introduction:**
  An overview of the smart water fountain project, including its objectives and goals.

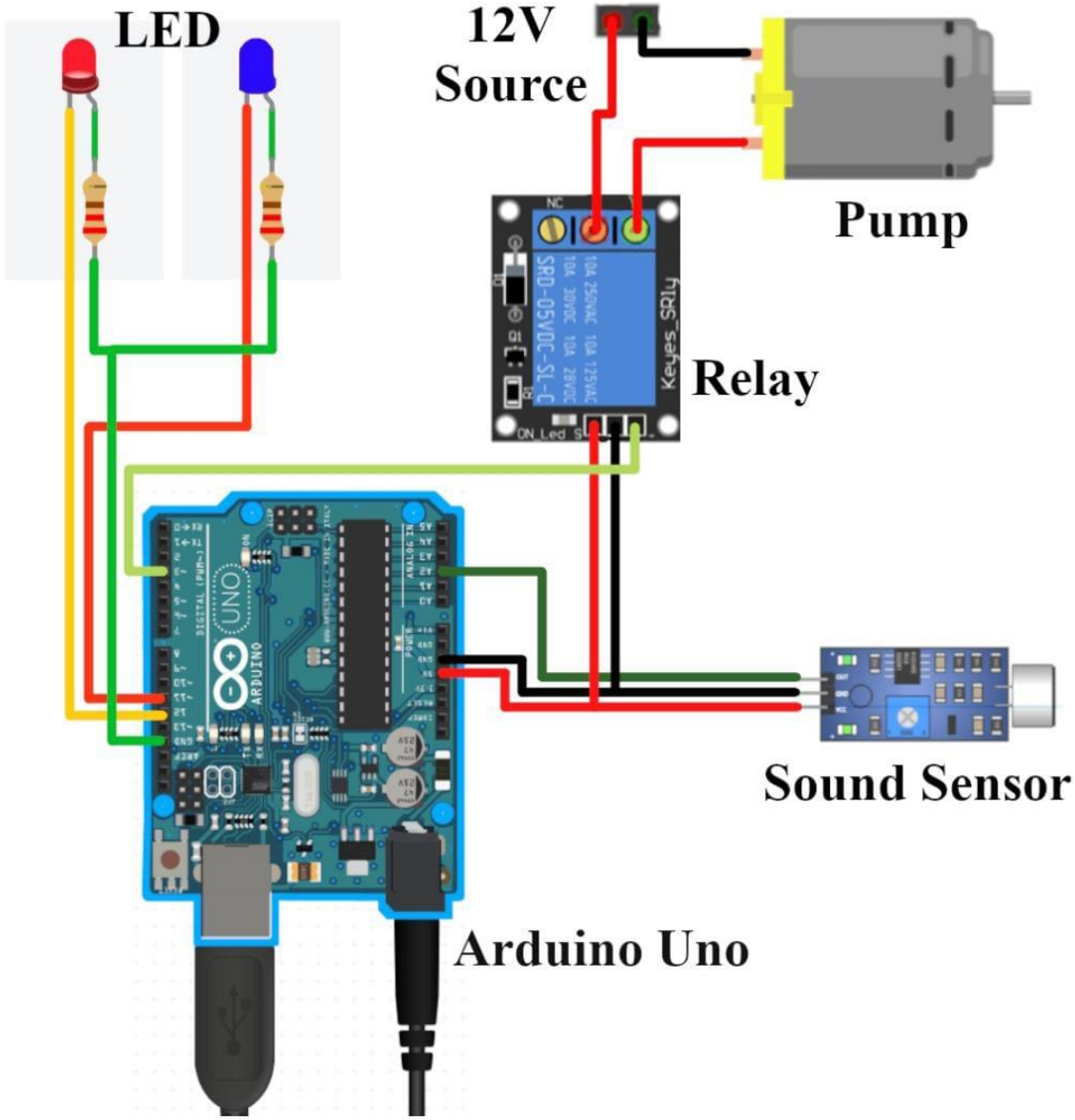
- **Design and Technology:**
  The design specifications, including the materials used, the physical structure of the fountain, and any innovative features.

- **Functionality and Features:**
  The functionality of the smart water fountain, including how it operates, dispenses water, and interacts with users.

- **Data Collection and Analysis:**
  The data collection methods implemented in the smart water fountains, such as user interaction data, water usage statistics, and environmental factors.

- **Maintenance and Sustainability:**
  The details is on the maintenance protocols, including regular cleaning procedures, filter replacements, and troubleshooting guidelines.

DEMONSTRATION:



CONCLUSION:

In conclusion, the Smart Water Fountain project successfully achieved its goal of creating an automated and interactive water feature. Through the integration of hardware components, including pumps, water level sensors, and motion detectors, along with Python code for control and monitoring, the fountain demonstrated the ability to maintain water levels, respond to motion, and offer a captivating and engaging user experience. The project serves as a

practical example of how technology can enhance traditional features, offering both convenience and entertainment to users while emphasizing the importance of safety and maintenance considerations in such installations.