AUTOMATIC WATER CONSERVATION SYSTEM

WATER CONSERVATION PROJECT: AUTOMATIC WATER PUMP SYSTEM

- Water conservation is a critical concern in today's world.

- There is an increasing water scarcity and hence the importance of sustainable water management.

- This project aims to develop an automatic water level control system for a water tank to prevent overflow and wastage.
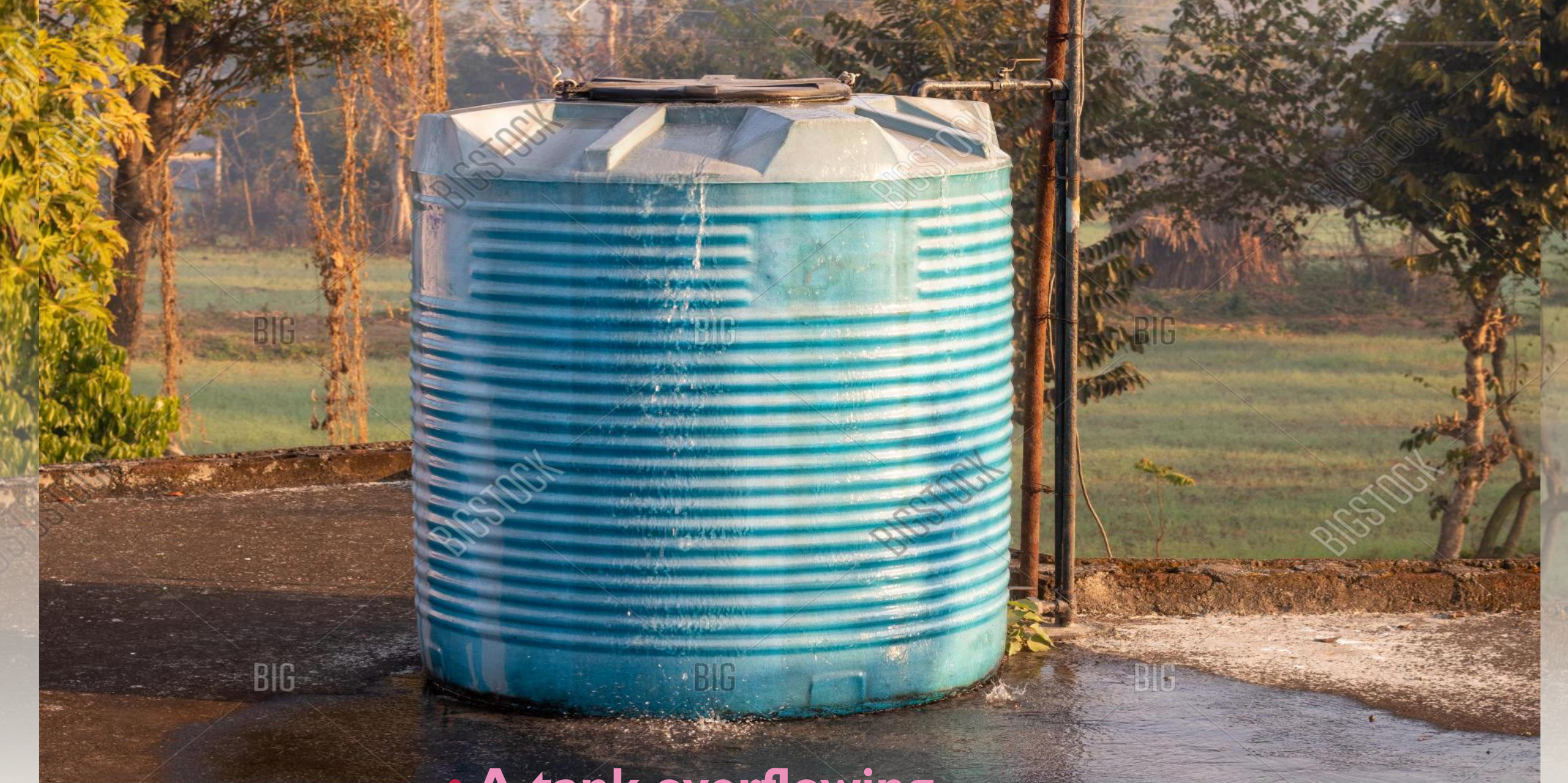
• A tank overflowing

OBJECTIVES

- Design and implement an automatic water control system.

- Programming a submersible pump to pump water until it reaches a predetermined level (the top of the tank).

- Automatically turn off the pump to prevent overflow when the water reaches the predetermined level.

- Design a subsystem which can clean the internal walls of the tank

COMPONENTS USED

- Mini submersible water pump
- Water sensor
- Microcontroller (Arduino)
- Water tank (small scale)
- Buzzer
- LED
- Jumper wires
- Breadboard
- Resistors
- DC motor
- Improvised shaft
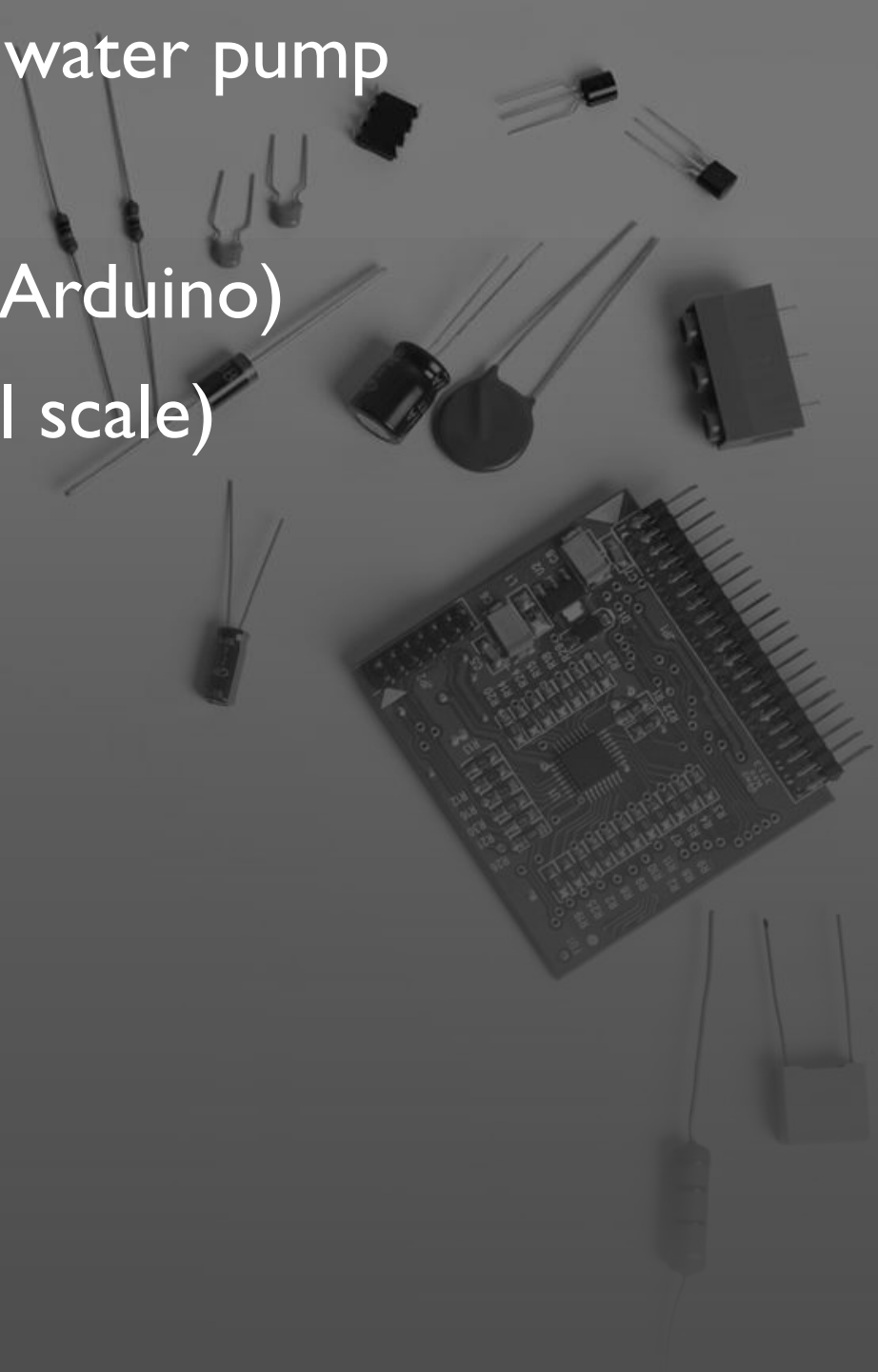
KEY COMPONENTS
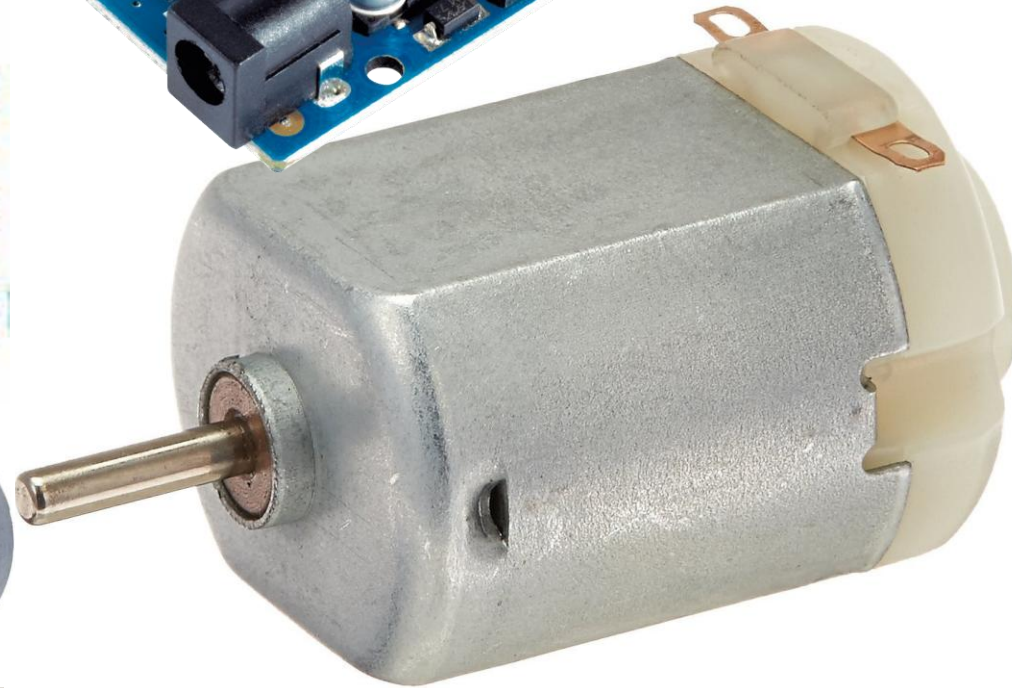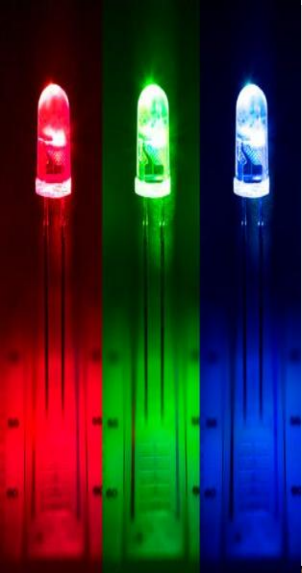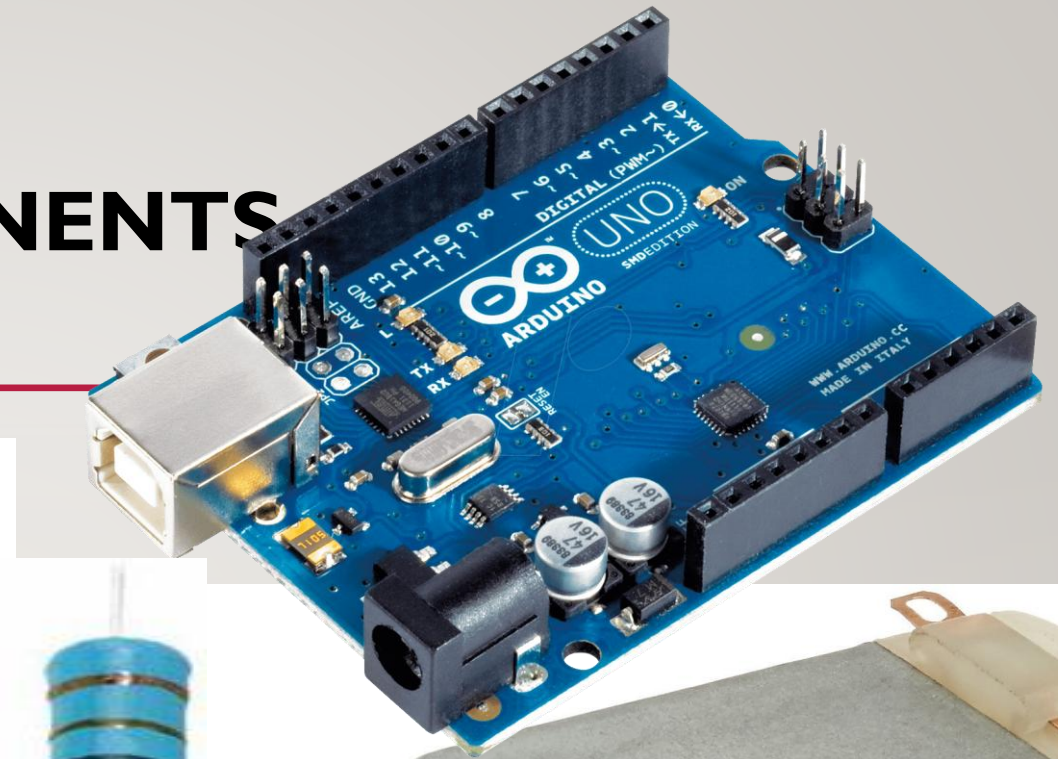
METHODOLOGY

Setup and Assembly

- The mini water pump connected to the water tank inlet.

- The water sensor is attached to the tip of the tank.

- The microcontroller is then programmed to receive input from the water sensor and control the pump operation, i.e. either to turn it on or off.

PROGRAMMING THE MICROCONTROLLER

The microcontroller activates the water pump when the water level is below the predetermined level.
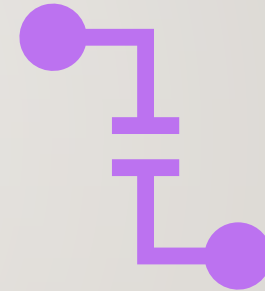
The water sensor then sends a signal to the microcontroller to turn off the water pump when the water level reaches the predetermined level.

ASSEMBLY OF THE BREADBOARD

- Two LEDs and a buzzer were connected to different digital pins of the Arduino board.

- The sketches written(the code) was so as to accept input from the water sensor in values ranging from 0 to about 800. The higher the value, the greater the area of water that covers the water sensor.

- The resistors are in place to protect the LEDs .

PICTURE OF THE SYSTEM.
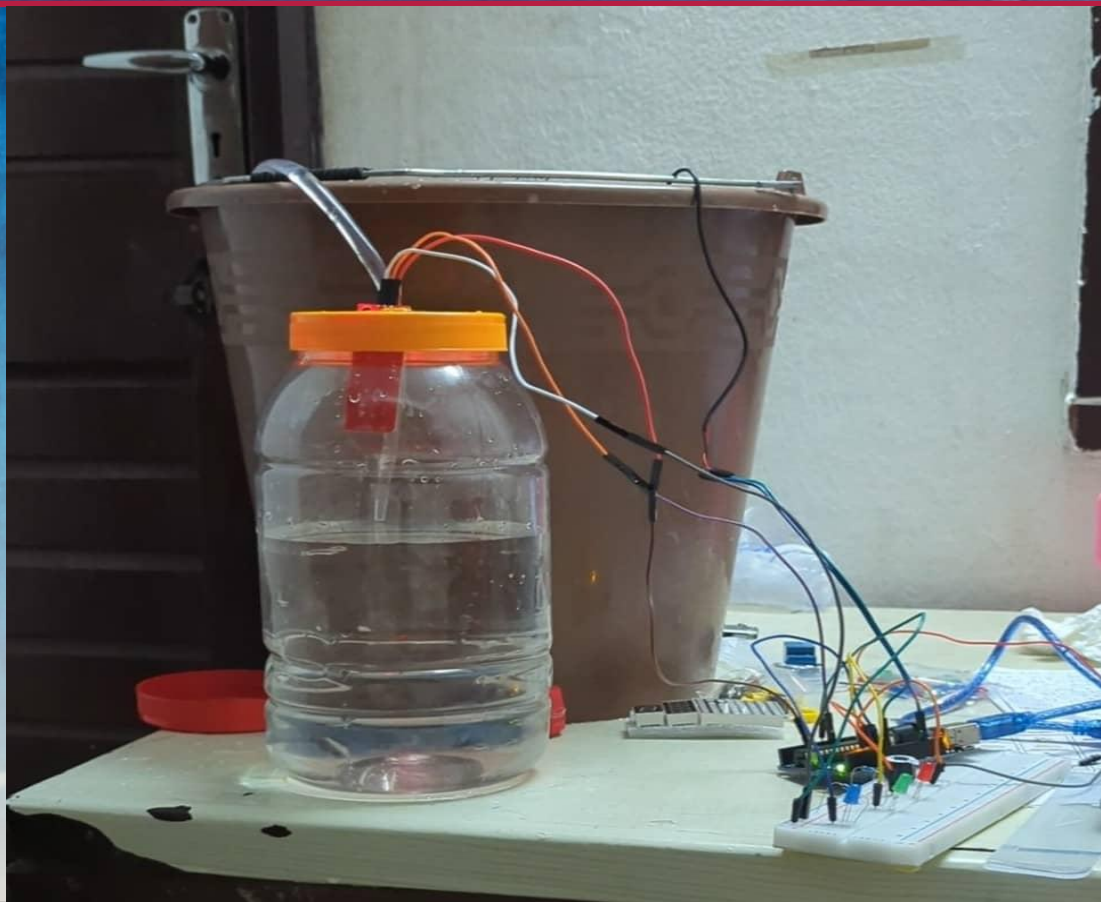
RESULTS

- The automatic water pump system successfully controls the water level in the tank.

- The pump is activated when the water level is below the predetermined level.

- Pump is automatically turned off when the water level reaches the predetermined level, preventing overflow and conserving water.

ADVANTAGES OF THE AUTOMATIC WATER CONSERVATION SYSTEM

- It conserves water

- It conserves electricity, which is used to pump the water

- It conserves the structure, since it ensures that water does not runoff to weaken the structure.

HOW IS THIS PROJECT INNOVATIVE?

AUTOMATION: THE SYSTEM OPERATES AUTONOMOUSLY, REDUCING THE NEED FOR MANUAL MONITORING AND INTERVENTION. THUS, IT DOES NOT NEED A HUMAN PRESENCE.

PRECISION CONTROL: IT UTILIZES A WATER SENSOR TO **ACCURATELY** DETECT AND CONTROL THE WATER LEVEL, ENSURING EFFICIENT USE OF WATER.

SCALABILITY: THE SYSTEM CAN BE SCALED UP AND IMPLEMENTED IN LARGER WATER STORAGE SYSTEMS FOR BROADER WATER CONSERVATION EFFORTS.

REAL-LIFE APPLICATION: THE SYSTEM ADDRESSES A REAL-LIFE PROBLEM OF WATER WASTAGE DURING TANK FILLING, PROVIDING A PRACTICAL SOLUTION FOR WATER CONSERVATION.

CONCLUSION

- The developed system demonstrates an effective method for conserving water by preventing overflow and wastage.

FUTURE IMPROVEMENTS

- Integration of a more advanced water level sensor for improved accuracy and reliability.

- Mobile App Integration: Develop a mobile application to remotely monitor the water level, control the pump, and receive alerts when the water level reaches the predetermined level or in case of any malfunctions.

- Water Quality Monitoring: Integrate a water quality sensor to monitor and alert about the water quality, ensuring the water being pumped into the tank is clean and safe for use.