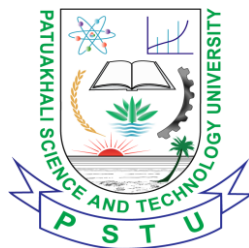


Patuakhali Science and Technology University



Project Proposal

on

Arduino based automatic water dispenser and hand wash machine

Course Code: CIT-312

Course Title: Microprocessor and Assembly Language Sessional

Submitted To

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ABSTRACT

The rapid growth of the Internet of Things (IoT) changes humans life into a smartworld. Physical objects connected with smart sensors provide data to make people's life easier. We present a case study of the smart water dispenser is with the aid of weight sensor, temperature sensor, and raspberry is built to assists the users and the water bottles suppliers by tracking the amount of water used in day to day activity. The smart water dispenser measures the weight of the available water in the dispenser and pops an alert when the water in the dispenser is about to finish

Here we put forward a fully automated RFID based water dispenser system using Arduino and Relay. The system is capable of fully automated water dispensing using solenoid tap and sensors. The system also senses if glass is placed at the counter to avoid water spoilage if there is no glass placed at the counter panel. The system uses IR sensor to detect presence of glass and then the sensors send a signal to the microcontroller. The microcontroller now processes the information sent by the sensors to determine if glass is present. The system has RFID Reader that is used to read particular tags and send information to microcontroller about valid tags. On detecting a valid tag the system now sends a signal to the controller who checks if glass is present and then it starts the motor to pour water in glass using motor as long the glass is present. If glass is removed during the process, system stops the water supply until glass is encountered. Thus we here put forward a smart water dispenser system with water saving feature

INTRODUCTION:

About 71% of earth is covered with water, but sadly only 2.5% of it is drinking water. With rise in population, pollution and climate change, it is expected that by as soon as 2025 we will experience perennial water shortages. At one hand there are already minor disputes among nations and states for sharing river water on the other hand we as humans waste a lot of drinking water due to our negligence. The Internet of things or IoT refers to a system which is having interconnected devices including humans and animal, with unique identifiers, Which have the ability to transfer data without human interaction through a network. It is predicted to reach more than 50 billion devices by 2020. Smart homes, health care and transportation are few related systems. Environmental smart devices can work according to the contextual awareness that can not be achieved through manual monitoring

Nowadays, water wastage one of the main problems that occurred in daily life. There are few initiatives to reduce problems. One of the main problems that cost the water wastage is because of the water leakage or excessive water usage

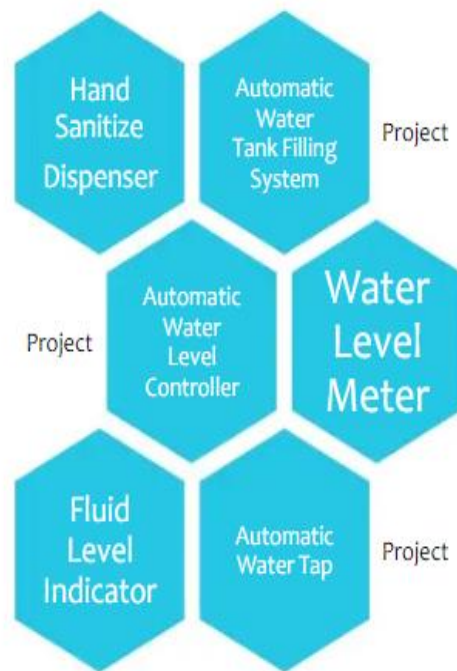
Every house has at least one water dispenser that could be operated manually. There are also some factories that main on producing water products by using tins and bottles. There are few of the factories that use automatic water dispenser for the production. This is because Automatic water dispenser are more efficient than the present water dispenser. If we replace all the normal water dispenser that uses a manual tap with an automated water dispenser that opens and closes on each own automatically, not only we can save water but also have a healthier since we don't have to operate the tap with our dirty hands.

Thus, we propose the project named Automatic Water Dispenser using Arduino and a Solenoid valve that the concept of motion sensor that automatically pour a fixed amount of water when a glass is put near it.

Problem Statement:

The present water dispensers are low efficiency and time costs. So, these disadvantages can be improved by this project. As the former problem, it can be clearly seen that the drink needs to be prepared manually. This also occurred in the factory than the main on producing water products such as bottles and cans drink. So, it is time-consuming as the mass production in a short time is needed to be improvised. Furthermore, the cost of employee salary might be quite high as a large number of employees required. So, this automatic water dispenser can increase the efficiency of the work done better than a worker and it is also reduced the cost as the instalment and maintenance are not that expensive. Lastly, some people might accidentally cause a water wastage by excessive water spilling when pouring the water. So, the automatic water dispenser will pour down a considerable amount of water into a cup so water excessive spilling could be avoided.

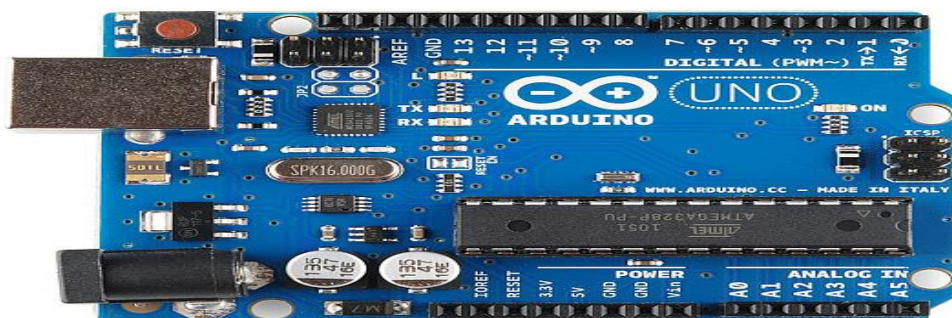
Literature Review



Principle of Methodology:

Arduino:

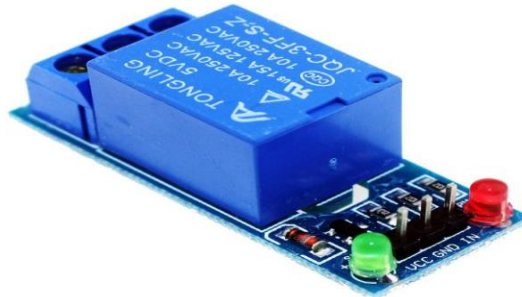
The digital and analog input/output pins equipped in this board can be interfaced to various expansion boards and other circuits. The Serial communication interface is a feature in this board, including USB which will be used to load the programs from computer



Relay:

As you can see it has two coil terminals, Its basic working principle is just like a relay, as in the case of a relay when we connect GND and 12v from the power supply with the relay coil pins, the relay operates, similarly solenoid valve has also two coil terminals, and when these terminals are connected with GND and 12 volts the solenoid valve can be operated and thus can be turned ON or Turned Off depending on the type of the Solenoid Valve.

A solenoid valve is connected with relay common and normally open contacts. A GND from dc power jack is connected with one terminal of the solenoid valve, and the other terminal of the solenoid valve is connected with common of the relay and normally open contact of the relay is connected with 12v. So turning on and off this relay, we can turn on and turn off this solenoid valve.



Ultrasonic sensor:

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e. the sound that humans can hear). Ultrasonic sensors have two main components: the transmitter (which emits the sound using piezoelectric crystals) and the receiver (which encounters the sound after it has travelled to and from the target).

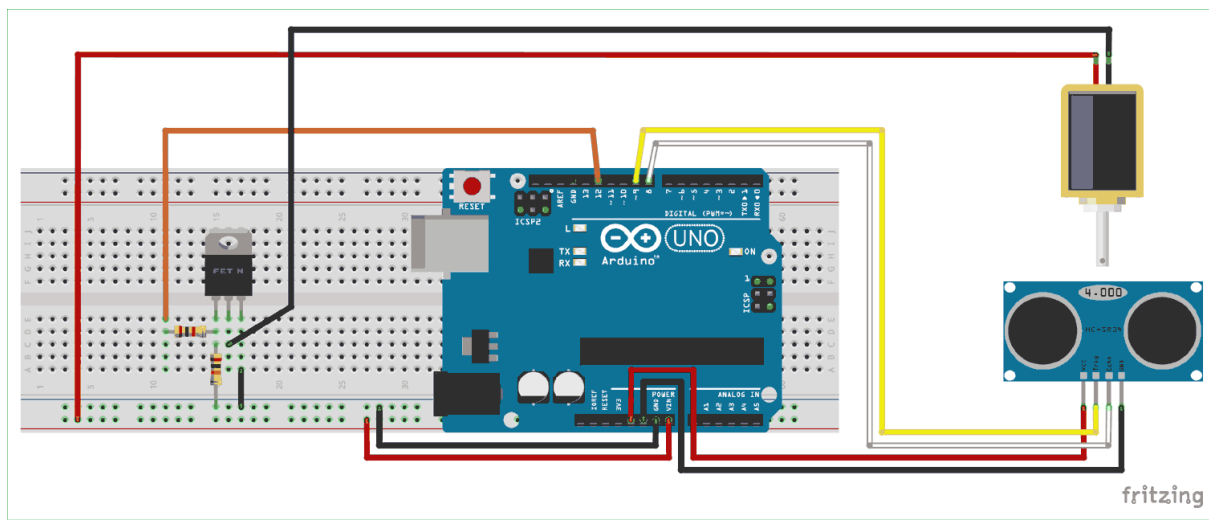


Water Pump:

This DC 3-6 V Mini Micro Submersible Water Pump is a low-cost, small-size Submersible Pump Motor that can be operated from a 2.5 ~ 6V power supply. It can take up to 120 liters per hour with a very low current consumption of 220mA. Just connect the tube pipe to the motor outlet, submerge it in water, and power it.



Block Diagram:



Working Principle:

The Concept behind the Automatic Water Dispenser is very simple. We will use a HCSR04 Ultrasonic Sensor to check if any object such that the glass is placed before the dispenser. A solenoid valve will be used to control the flow of water, which is when energised the water will flow out and when de-energised the water will be stopped. So we will write an Arduino

program which always checks if any object is placed near the tap, if yes then the solenoid will be turned on and wait till the object is removed, once the object is removed the solenoid will turn off automatically thus closing the supply of water.

Objective:

Increased intelligence of every day, sensor objects implemented in devices offers opportunities for new applications and services. Multisensory integration is a very promising approach for robust monitoring and understanding of the measurement context. A cloud-based solution allows seamless integration with a standard infrastructure for a large number of users but requires higher power consumption. The smart water dispenser can be improved with a lot more facilities in the future. Particularly by attaching an RFID reader to the dispenser we can track the amount of water every person has consumed in the day and Avoid wastage of water.

Conclusion

- Improve the clean and healthy daily life nowadays, because we need to adapt to our new daily lifestyle after the world virus pandemic
- Create a better technology for our future
- Avoid wastage of water
- Can be applied to a larger concept to ease a certain factory based on water package production
- The student will be able to understand on how to use Proteus app and learn about the c programming language