AUTOMATIC WATER IRRIGATION SYSTEM

**A Project submitted in partial fulfillment of the requirements
For the Award of Degree of
Bachelor of Science in Electrical and Electronic Engineering**

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DEPERTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING
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Certification

This is to certify that this project and thesis entitled **"Automatic water irrigation system"** is done by Shakil Ahmed, ID No: 153-33-3044 and Mousumi Khatun, ID No: 153-33-2882, under my direct supervision and this work has been carried out by them in the laboratories of the Department of Electrical and Electronic Engineering under the Faculty of Engineering of Daffodil International University in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering. The presentation of the work was held on November 2018

Signature of the Candidate

                                         Signature of the Supervisor
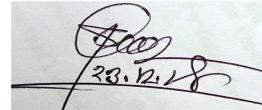
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Dedicated to

Our Parents

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List of Abbreviations

AC	Alternating Current
DC	Direct Current
IC	Integrated Circuit
NC	Normal Close
NO	Normal Open
PCB	Printed Circuit Board
FDR	Frequency Domain Reflectometry
TDR	Time Domain Reflectometry
TDT	Time Domain Transmission
GDP	Gross Domestic Product
SCADA	Supervisory Control And Data Acquisition
GPS	Global Positioning System
USB	Universal Serial Bus
MHz	Megahertz
UART	Universal Asynchronous Receiver-Transmitter
TWT	Travelling-Wave Tube
SPI	Serial Peripheral Interface
LED	Light-Emitting Diode
USART	Universal Synchronous/Asynchronous Receiver/Transmitter
MIPS	Million Instructions Per Second
EEPROM	Electrically Erasable Programmable Read-Only Memory
RAM	Random-Access Memory
CPU	Central Processing Unit
ALU	Arithmetic-Logic Unit

LIST OF SYMBOLS

1 Ø	Single Phase
V	Voltage
Q	Charge
C	Capacitance
f	frequency

ACKNOWLEDGEMENT

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ABSTRACK

This is most important cultural practice by watering and most labor intensive task in daily greenhouse operation. Watering systems ease the burden of getting water to plants when they need it. Knowing when and how much to water is two important aspects of watering process. To make the gardener works easily, the automatic plant watering system is created. There have a various type using automatic watering system that are by using sprinkler system, tube, nozzles and other. This project uses watering sprinkler system because it can water the plants located in the pots. This project uses Arduino board, which consists of ATmega328 Microcontroller. It is programmed in such a way that it will sense the moisture level of the plants and supply the water if required. This type of system is often used for general plant care, as part of caring for small and large gardens. Normally, the plants need to be watered twice daily, morning and evening. So, the microcontroller has to be coded to water the plants in the greenhouse about two times per day. People enjoy plants, their benefits and the feeling related to nurturing them. However for most people it becomes challenging to keep them healthy and alive. To accommodate this challenge we have developed a prototype, which makes a plant more self-sufficient, watering itself from a large water tank and providing itself with artificial sunlight. The pro-To type reports status of its current conditions and also reminds the user to refill the water tank. The system automation is designed to be assistive to the user. We hope that through this prototype people will enjoy having plants without challenges related to absent or forgetfulness Bangladesh is a third world country with less economic growth. About36 %(Bangladesh) of GDP and 64% (Bangladesh) of its employment comes from agriculture. But our agricultural history is declining due to lack of irrigation facility. At the same time the existing irrigation facilities cost the government a huge amount of subsidy every year. So it's a high time that we find an alternative way of irrigation so that our subsidy is reduced as well as people get water throughout the year. And gives birth to our project. In our project, we will be analyzing the feasibility of Automatic water irrigation system for surface irrigation in the context of Bangladesh.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Bangladesh's significant wellspring of pay is from agribusiness area What's more, 70% of ranchers and general individuals rely upon the agribusiness. In Bangladesh the vast majority of the water system frameworks are worked physically. These old fashioned strategies are supplanted with semi-computerized and mechanized systems. His accessible conventional procedures resemble dump water system, terraced water system, dribble water system, sprinkler framework. The worldwide water system situation is arranged by expanded interest for higher agrarian profitability, poor execution and diminished accessibility of water for

Agribusiness. These issues can be fittingly amended on the off chance that we utilize robotized framework for water system. A. Need of Automatic Irrigation Simple and simple to introduce and arrange. Sparing vitality and assets, with the goal that it tends to be used in legitimate way and sum. Agriculturists would have the capacity to spread the appropriate measure of water at the perfect time via computerizing homestead or nursery water system. Evading water system at the wrong time of day, diminish spillover from over watering soaked soils which will enhance trim execution. Mechanized water system framework utilizes valves to turn engine ON and OFF. Engines can be mechanized effectively by utilizing controllers and no need of work to turn engine ON and OFF. It is exact technique for water system and a profitable apparatus for precise soil dampness control in exceedingly concentrated nursery vegetable generation. It is efficient, the human mistake end in accessible soil dampness levels.

The primary point of this venture was to give water to the plants or cultivating naturally utilizing microcontroller (Arduino Uno). We can naturally watering the plants when we are taking some time off or don't we need to trouble my neighbors, Sometimes the

neighbors do excessively of watering and the plants wind up kicking the bucket at any rate. There are clock based gadgets accessible in India which waters the dirt on set interim. They don't detect the dirt dampness and the encompassing temperature to know whether the dirt quite watering or not.

1.2 Problem Statement

Water system has been distinguished as one of the mainstays of accomplishing vision 2030 by the legislature of Kenya in 2007. In its pronouncement named Kenya vision 2030 the nation plans to preserve water and begin better approaches for gathering also utilization of rain and underground water to advance farming efficiency. Kenya is a water rare nation as per the world nourishment software engineer, the vision 2030 activity proposes escalated use of science, innovation and advancement to raise profitability and productivity however water system extension is probably going to expand the shortage of water which will prompt the opposition for the accessible substance by irrigators, ventures and pastoralists.. It perceives the basic pretended by innovative work in quickening financial improvement in all the recently industrialized nations of the world. As of late propelled water system plans e.g. the one million section of land Galana-Kulalu water system conspire still grasp the utilization of manual water system which will include utilization of more water since there is no control and consequently this undertaking proposes the utilization of programmed water system control framework.

1.3 Objectives

The objective or destinations of which the planned gadget is required to achieve is to manufacture a programmed water control with programmed water system framework The principle goal of this venture was s to configuration, develop and test a programmed water system control framework

1. Perceive the requirement for water sparing in water system frameworks
2. To control an irrigation system Using soil Moisture sensor
3. Decrease the amount of work pressure in workplace
4. To avert over laborers of the siphoning machine and keep it from getting terrible.
5. To dodge loss of water.

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1.4 Scopes

To automatically control the pump of project has designed which ensures stream of water in the land. The extent of the structure was keeping brief and easy to in other not to present pointless complexities and render it by and large uneasy. complicated peripheral device does not attached in The system which however incomprehensible for the detail printable data has been avoided for reasons of moderateness material of low range and less precise exhibitions rather than a well-assembled programmed water system was utilized to accomplish this point, the programmed water system recognize and control the water in the dirt

1.5 Methodology

For designing an automatic irrigation system, we can be used many methods such the device of switching but all methods need of human helpful. Using electronic control to supply the water except human interaction is designed in this project. It has designed diligently put on to irrigate the water, finally shut down the water pump is automatically any time and the pump is off while soil is wet.

The methodology utilized in this work is the measured structure access the general plan was broken into capacity square charts. Where every square in the chart speak to an area of the circuit that does an explicit capacity.

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Fig. 1.1 Automatic water irrigations block diagram

Fig: Automatic Water Irrigation System
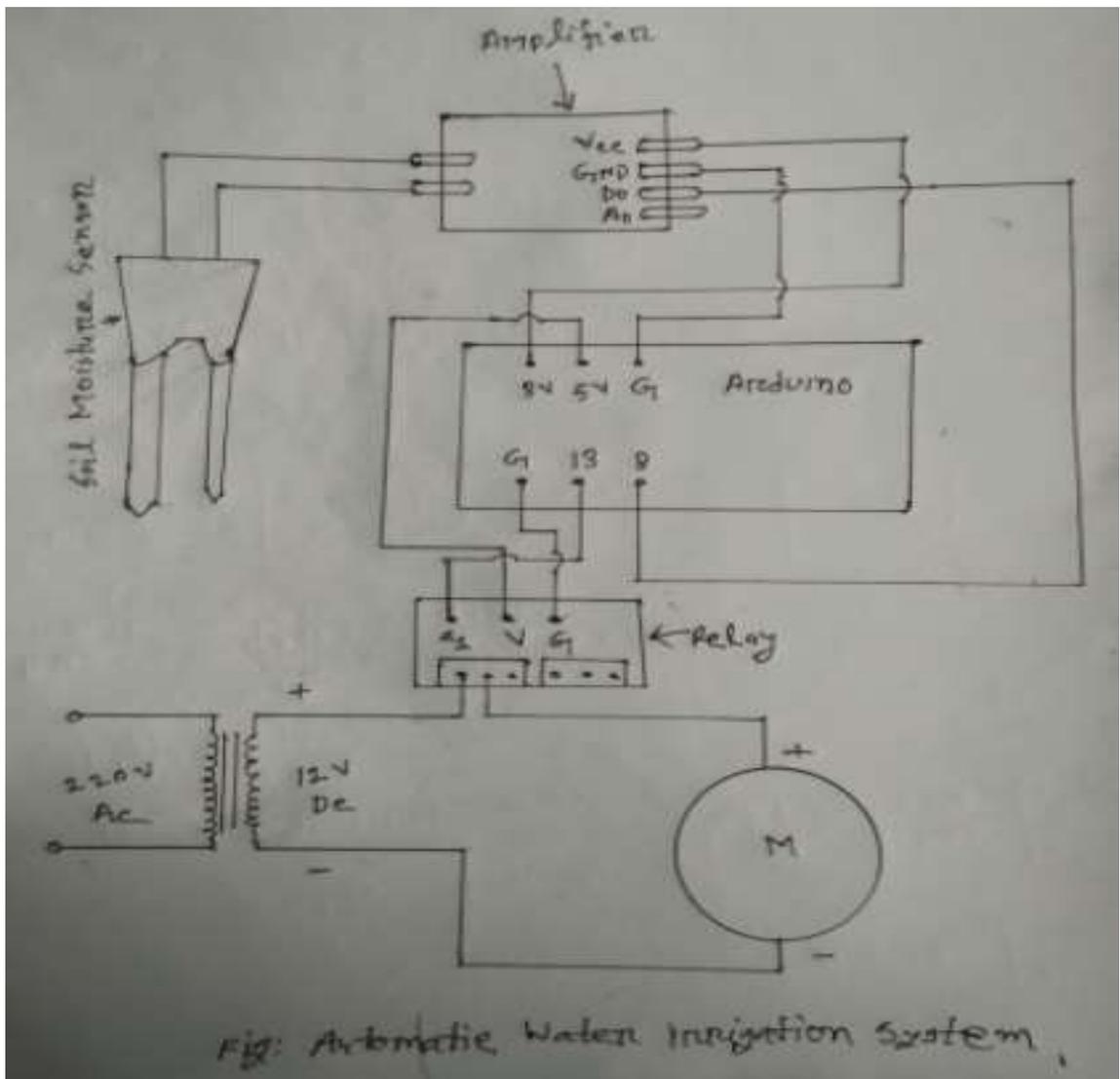
Fig. 1.1 Block diagram

1.6 Project Outline

This Project is organized as follows:

Chapter 1 introduces the project "Automatic water irrigation system". Also explain its objectives and methods.

Chapter 2 reviews the literature of the automatic water irrigation system.

Chapter 3 analyzes water irrigation system components. Overview of the whole system with the circuit diagram. Then, individual description of every component. The system is explained along with their ratings and connections and their purpose.

Chapter 4 recite the hardware development part of the different unit of the project. Also describes the basic operation of the controller.

Chapter 5 analysis the result and. adjacently, the advantages and estimate cost of the whole equipment's were discussed and disadvantage,

Chapter 6 working performing conclusion so far. How it will do the work in future and its limitation.

Chapter 2
LITERATURE REVIEW

2.1 Introduction

The switch off the pump when the land starts overflowing and Generally Switch is on the pump by People when their land go dry. As a results sometimes non-availability of water and the inessential wastage in the case of emergency.

we are using makes this system automatic of this circuit , i.e. it switches on the pump when the soil will be dry and switches it off as soon as the water irrigation reaches a pre-determined level.

2.2 Review

A programmed water system identifies the measure of water in the field and furthermore guarantees persistent water stream nonstop due to it's programmed, this programmed water control is comprised of Aurdiano and ATmega328 IC with 16 pins. IT was because of the way that transistors were not just less expensive, progressively solid and less power utilization however was a lot littler in size than an electronic cylinder. To exploit little transistors estimate, the detached segment also were diminish in size there by making the whole circuit little advancement of printed circuit board(PCB) further decrease the measure of hardware gear by dispensing with cumbersome wiring and tie point. In the mid-1960s another field of microelectronics was conceived basically to meet the prerequisite of the military which was to diminish the extent of it gadgets gear to roughly one tenth of it at that point existing volume. The drive outrageous decrease in the extent of electronic circuit has prompted the advancement of miniaturized scale hardware circuit called incorporated circuit (ICS) which are so little than their real development is finished by professionals utilizing powerful magnifying instruments. A coordinated circuit is a total circuit in which both the dynamic and inactive part are manufactured in on a minor single chip of silicon, Active component are those which have the ability to produce gain example are transistors and field effect transistors (FET). An integrated circuit sometimes called a

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chip or microchip is a semi-conductor wafer on which thousands of millions of tiny capacitors are fabricated and transistors, either analog digital An IC can be depending on its intended application.

2.3 survey

The featuring highlights are shrewd GPS based remote controlled robot to perform assignments like weeding, splashing, dampness detecting, human discovery and keeping carefulness. [3]The distributed computing gadgets that can make an entire figuring framework from sensors to apparatuses that watch information from agrarian field pictures and from human performing artists on the ground and precisely feed the information into the vaults alongside the area as GPS coordinates.[4]This thought proposes a novel strategy for brilliant cultivating by connecting a shrewd detecting framework and keen irrigator framework through remote correspondence technology.[5]It proposes a minimal effort and productive remote sensor organize procedure to gain the dirt dampness and temperature from different area of ranch and according to the need of yield controller to take the choice whether the water system is empowered or not.[6]It proposes a thought regarding how mechanized water system framework was created to upgrade water use for farming harvests. What's more, an entryway unit handles sensor information.[7]The barometrical conditions are checked and controlled online by utilizing Ethernet IEEE 802.3.The fractional root zone drying procedure can be actualized to a greatest extent.[8]It is intended for Arduino based observing framework to examine edit condition and the strategy to enhance the productivity of basic leadership by dissecting harvest statistics.[9]In this paper picture preparing is utilized as an apparatus to screen the infections on organic products amid cultivating, ideal from estate to gathering. The varieties are found in shading, surface and morphology. [10]In this paper, nursery is a working in which plants are developed in shut condition. It is utilized to keep up the ideal states of the earth, nursery the executives and information obtaining

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2.4 Sensors

Moisturize sensor (Electrode) identify the soil temperature or moist of soil that send granular materials, powders and including liquids slurries. All substance that flow to become essentially level in their containers (or other physical boundaries) because of gravity. The substance to be measure can be inside a container or can be in its natural form (e.g. river or lake). The level measurement can be either continuous or point value. Continuous level sensors measure within a specified range and determine the exact amount of substance in a certain place. Hill point level sensors only indicate whether the substance is above or below the sensing point generally the latter detect levels that are excessively high or low there are many physical and application of variables that affect selection of optimal level monitoring method for industrial and commercial processes. The selection criteria include the physical phase (liquid solid or slurry), temperature, pressure or vacuum, density (specific gravity) of medium, agitation, acoustic or electrical noise, vibration, mechanical shock, tank or bin size and shape also important are the application constraint price, accuracy, appearance response rate, ease of calibration or programming, physical size and mounting of the instrument or discrete (point) levels. [5]

2.5 Summary

This project design by two adaptor or power supply unit, Arduino uno R3 which microcontroller model is Atmega328p, relay module and soil moisturize sensor.

CHAPTER 3

ANALYSIS OF THE SYSTEM COMPONENT

3.1 Introduction

Water stream Controller utilizes a straightforward instrument to identify and keep up the water system in a horticultural land or some other compartment by exchanging it on/off the engine naturally when required. Here utilized soil saturated sensor. The sensor is keeping up the water stream in the dirt by activating and retriggering the clock IC. Here the clock IC is acting in mono stable mode or one-shot mode,

3.2 Materials and Methods

In spite of the fact that there are a few organizations moving these frameworks made in different courses, there is a basic manner by which one can construct his/her own plant watering framework in only a Barely any hours, if every required material are accessible alongside essential required information about gadgets. To build this framework one should legitimately interface following
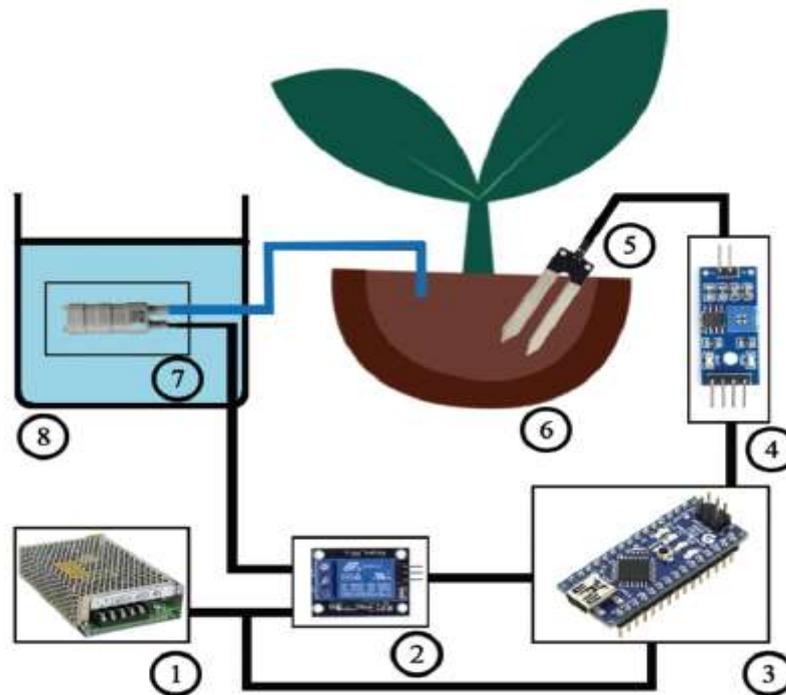
Fig:3.1 methods of system

1) Power Supply (12V)
2) Relay module
3) Microcontroller (Arduino Nano)
4) Amplifier circuit as part of a soil moisture sensor
5) Soil moisture probes
6) Plant in the flowerpot
7) Water pump
8) Water container

Figure 3.1 beneath demonstrates the association of all previously mentioned materials in the framework. (Figure 3.1)   In our examination, precisely associated every single required material by us as appeared in Figure 1 above, in this state to test whether our framework will work appropriately or not. Likewise, the general conduct and the presence of our plant, that was subject of the examination, were seen in the accompanying 30 days.

3.2.1 Arduino uno R3

In this project has used an Arduino uno R3 in which microcontroller board based on the ATmega328. There are total 32 pins in this Arduino UNO R3 and 14 pins are digital pin of them in the Arduino. 6 pin can be used PWM outputs , for analog input used 6

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pin, ceramic resonator is 16 MHz it's called clock frequency .it has one port USB connection and one 12 volt power supply port by which supply the power another circuit, it has a reset button which is reset the program. TXD and RXD both are digital pin. TXD is serially transmitting and RDX is serially receiving port. On the other hand it has 6 analog inputs 5v vcc pin, 3.3v vcc pin, ground pin (it has 3 ground pin but all analog pin), ROW input, RESET pin, and at last Analog reference pin.

Now another 6 pins are MOS-0, MOS-1, SS, SCK, SDA, and SCL, all this six pins are called pin header. Two 8 bits microcontroller has used in this Arduino and other two pins are input/output pin and only boot loader (its programming loading system). The microcontroller supported require everything it has contains; USB cable or power used simply connect it to a computer with a AC-to-DC adapter or battery to get started The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip.

Fig. 3.2 Aurdiano UNO R3 Board

The power source is chosen consequently. Outer (non-USB) power can come either from an AC-to-DC connector (divider mole) or battery The Arduino Uno can be fueled by means of the USB association or with an outside power supply. 2.1mm focus positive fitting into the board's capacity jack associated by plugging with adapter. Connector. By 6 to 20 volts can operate the board an external supply. If supply voltage

less than 7V, however, less than five volts by 5V pin and as a result the board not stable.

Table 3.1 Arduino Specifications

Feature	Specification
Microcontroller	ATmega328
Operating voltage	5v
Input voltage (recommended)	7-12v
Input voltage(limits)	6-20v
Digital i/o pins	14(of which 6 provide PWM output)
Analog input pins	6
DC Current per I/O Pin	40mA
DC Current for 3.3v	50mA
Flash Memory	32 KB(ATmega328) of which 0.5KB Used by boot loader
SRAM	2KB(ATmega328)
EEPROM	1KB(ATmega328)
Clock Speed	16 MHZ

3.2.1a Analysis of Programming:

Using Arduino software selected the program which is works in The Arduino uno " from the goods of Arduino Uno > Board menu (according to the microcontroller on your board). See tutorials the and reference. For details, it without the use of an external hardware programmer The ATmega328 on the Arduino Uno comes preburned with a boot loader that allows you to upload new code to. Using the original STK500 protocol (reference, C header files) it communicates. the ICSP (In-Circuit Serial Programming) header; is bypass in a microcontroller this is the boot loader and programs the through see their information for details The DFU boot loader used to load by ATmega16U2/8U2 , which can be activated by: other microcontrollers and another Arduino also used computer for communicating

Facilities or UART TTL (5V) serial communication used ATmega328 provides, on digital pins 0 (RX) and 1 (TX) are available in the Arduino. This serial communication over USB and appears as a virtual com port to software on the computer An

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ATmega16U2 on the board channel. The '16U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, an .in file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1). A Software Serial library allows for serial communication on any of the Uno's digital pins. The ATmega328 also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus.

3.2.1b Physical Characteristics:

The Uno PCB are 2.7 and 2.1 inches respectively are the maximum length and width with the power jack and USB connector and extending beyond the former dimension. The board to be attached to a surface or four screw holes allow case. The digital pin 7 and 8 is 160 mil (0.16"), distance between them not an even multiple of the 100 mil spacing of the other pins.

**3.2.1c Function of Different Pin**
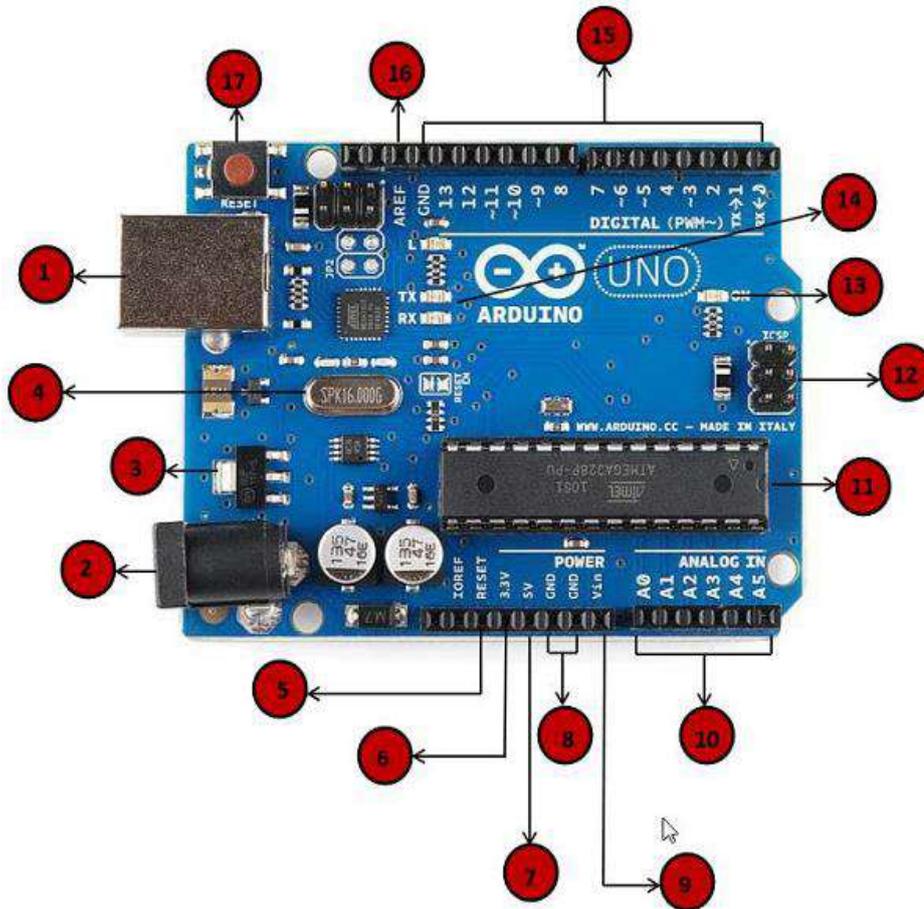
Fig.3.3 Function of Different Pin.

I, USB power port

Using the USB cable Arduino board can be got power from our PC. Connected USB link to the USB association you need to do.

II, Barrel Jack of power

By connecting it to the Barrel Jack (2). Arduino sheets can be controlled straightforwardly from the AC mains control supply.

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III, Voltage Controller

The amount of voltage is required control the Arduino board and balance out the DC voltages discover by the different components and processor.

That's voltage control by the voltage regulator

IV, Arduino Crystal Oscillator

Arduino in managing time issues is helped by the precious stone oscillator. The Arduino ascertain the time by utilizing the gem oscillator. Best of the number printed of Arduino gem is 16.000H9H. It has the measure of recurrence is 16,000,000 Hertz or 16 MHz

V, 17 Reset pin of Arduino

Arduino board can be reset by you, i.e., from the earliest starting point will be start begin your program. Two separate ways, you will be reset the UNO board. First way, by utilizing the reset catch (17) on the board. And 2nd way, the Arduino stick named RESET (5) can be associate an outer reset catch by you.

6,7,8,9 Pins (3.3v, 5v, GND, VIN)

- 6 pin is supply 3.3 output volt
- 7 number pin is 5 volt output supply
- Arduino board works fine most of the component with 3.3 volt and 5 volt.
- 8 number pin is GND (Ground) – in the Arduino has several GND pins, these are used to ground our circuit.
- 9 number pin is Vin −by the Vin pin you can supply the power at Arduino board from an external power source, like the mains power supply of Ac.

X, simple or (Analog) pins

There are five Analog pins in the Arduino UNO board, like A0 through A5. Here the humidity sensor and temperature sensor are analog sensor. When any signal come from analog sensor which is converted into digital value By These pins and read it by the microprocessor.

XI, Prime microcontroller

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This is own microcontroller (11) of Each Arduino board. You think the microcontroller is the brain of an Arduino board. On the Arduino is slightly different from board to board by the main IC (integrated circuit).generally ATMEL Company makes the microcontrollers. You should recognize what IC your block has before stacking another program from the Arduino IDE. This data is accessible on the highest point of the IC. To know more insights concerning the IC development and capacities,

XII, ICSP pin

ICSP (12) is an AVR it is the most important part of an Arduino, for the Arduino comprising of MISO, RESET, MOSI, VCC, SCK, and GND in a modest programming header. As a SPI (Serial Peripheral Interface) it is frequently alluded, and as a "development" of the yield it could be considered. Really, the output substance to the master of the SPI transport are solved by you.

XIII, indicator as a Power LED

Power LED indicate the power when the power supply in the board.
When we connect the plug with our Arduino into a power source to indicate that your board is powered up correctly. When the connection will be something wrong then the light dose not turn on,.

XIV, the pin of TX and RX LEDs

This is another important part of Arduino board. There are two functions: like for transmit is TX (transmit) and for receiving is RX (receive). Appear these pin is first, pins 0 and 1 are digital pin, by these pin indicate the serial communication. Second, the RX and TX a led (13). The TX led flashes while sending the serial data with different speed. Flashing speeds depends on the baud rate used by the board. When the receiving process happen that time is RX flash time

XV, Digital Input/output pin

There are total 14 digital I/O pins in this Arduino 0 to 13 pin are Digital pin.
There are 6 PWM (pulse Width Modulation) These pins can be arranged to fill in as information computerized pins to peruse rationale esteems (0 or 1) or as advanced yield

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pins to drive diverse modules like LEDs, transfers, and so forth. The pins named "~" can be utilized to produce PWM.

XVI, AREF

It is sometimes, the upper limit for the analog input pins. used to set an external reference voltage (between 0 and 5 Volts) as AREF stands for Analog Reference. [5]

3.2.2 Power Supply

Two power supply has used in this project. An electrical load received electric energy by a power supply. Which is an electronic device and by that's to convert one form of electrical energy to another. Then outcomes, as electric power converters refereed are sometimes by power supplies. Whereas others are built into larger devices along with their loads. Examples of the latter include power supplies found in desktop computers and consumer electronics devices. The source of this power can come from different source like the main power source AC voltage and battery or even from a renewable power source like solar panel wind turbine or fuel cell to name just a few. The most common source of power is usually the main AC
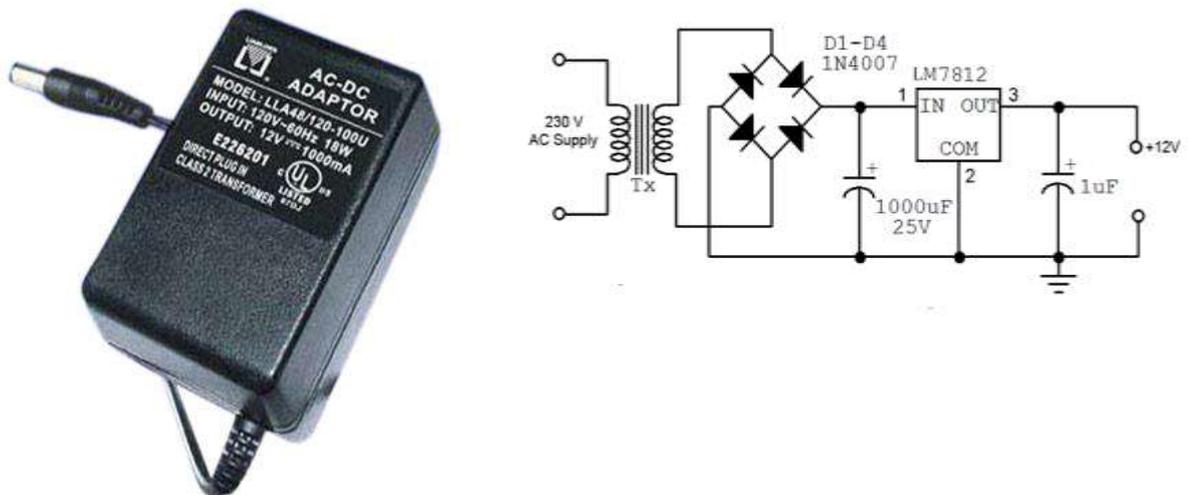

Fig. 3.4 Power Supply & Circuit Diagram AC-DC (220v-12v)

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Two pin Plug: by the two pin plug AC supply to transformers primary side from the switch board.it supplies 220v from AC line and its convert 9v output by the transformer.

Fig. 3.5 2pin Plug

3.2.2a transformer
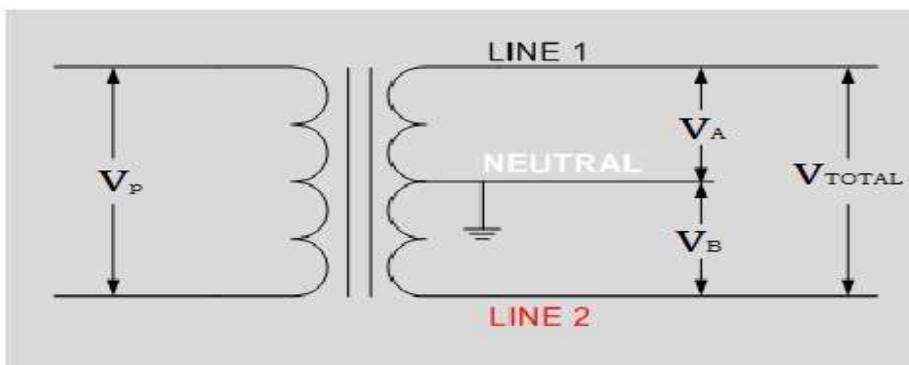
Fig.3.6 Transformer circuit representation

The transformer works according to 'faradays' electromotive induction rules.
It has two coils and we can consider 1st coil is primary and 2nd coil is secondary coil.
Two coil stay very closely. There are many types of transformer but here we will discussed about step down transformer because we need 12v transformer in this project.
When AC voltage supply to the primary then flow the current in the primary coil as a

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results create magnetic flux which is cut the secondary coil and induced new voltage at the secondary coil.

Turn ration = VP/VS=NP/Ns and power out = power in or Vs.

3.2.2b Works of the Transformer

We can see the fig: 3.6 is a center tap transformer its output total voltage separated by two voltage. First voltage is between line 1 and neutral and 2nd voltage is between line neutral and line two there name respectively Va and Vb .the equation of mathematically between two voltages are dependent upon the primary voltage as well as the turn ratio of the transformer

VA = (Na / Np) * VP

Vb = (Nb / Np) * Vp

The magnitude of two output voltage Va and Vb respectively are equal but direction is opposite, the phase difference between two voltages is 180 degrees. In this reason we should use full wave rectifier with a center tap transformer. To make both the voltage in phase.

3.2.2c Full-Wave Bridge Rectifiers

A full wave bridge rectifier are made by four diodes like D1, D2, D3 and D4. This is and electronic circuits by which converts AC voltage to DC voltage. A rectifier is made using diode and capacitor combination. The diode property is unique, in a single direction the current to flow is utilized in here permitting. The applied AC voltage is converted an AC voltage into a pulsating DC voltage for both half cycles. It converts both the half cycles of AC input into DC output it is the advantage of the bridge rectifier.
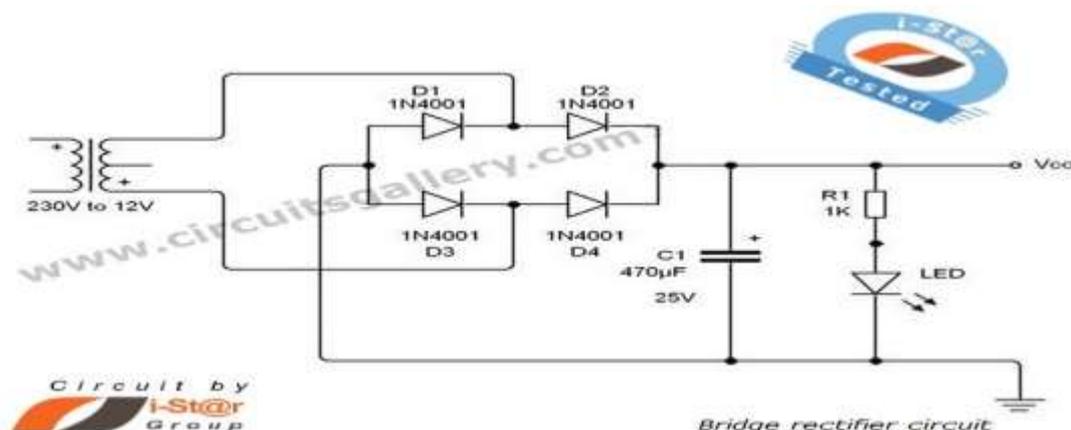

Fig. 3.7 circuit of bridge rectifier

When applied AC supply in the rectifier circuit for positive half cycle diodes D2 and D3 are stay forward condition and diodes D1 and D4 are reverse condition. So seen this stage the current through from D2 to Load after that load to D3. As a results complete positive half cycle.

When applied negative half cycle in the rectifier then, diodes D1 and D4 are forward state and rectifier diodes D2 and D3 are revers condition. In this stage the current through from D4 to load after that load to D1. And complete negative half cycle

Combination of both cycle, stack current streams a similar way. Consequently we get a throbbing DC voltage as appeared in fig ,
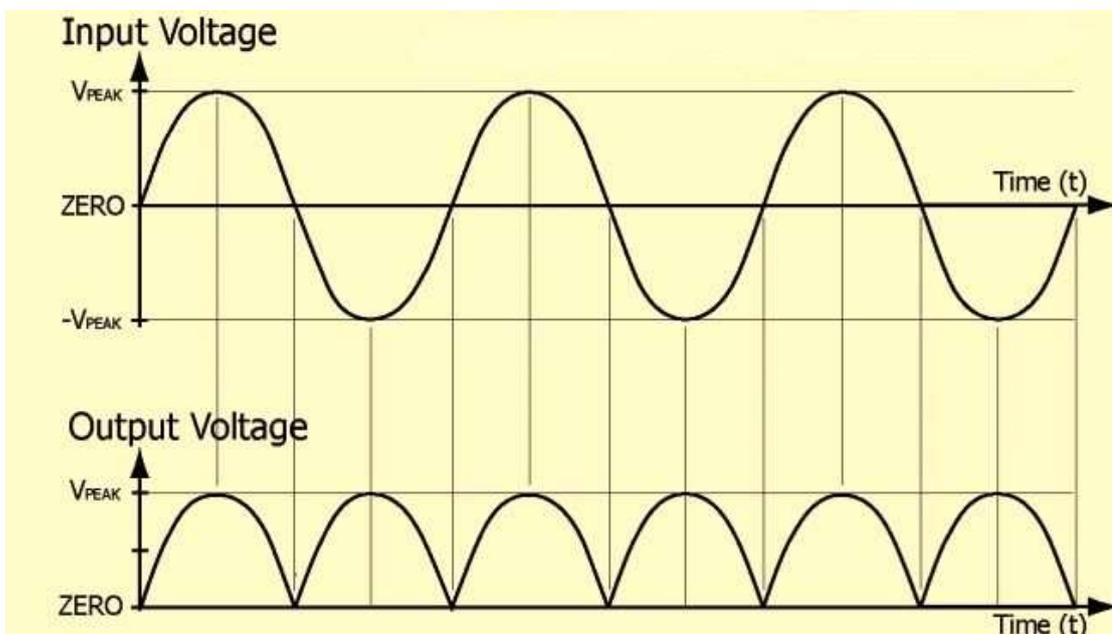

Fig: 3.8 input output curve

☐ by addition capacitor converted the output DC pulsating voltage to settle DC voltage.

☐ Capacitor will reverse biases when time period t=1s Input go to decrease, then the voltage across that capacitor the diodes D2 and D4 it will not conduct. If time period is t=1s then input voltage is increased and at the same time the value of capacitor charges will be maximum (peak value) of the input. Again after time. Voltage across the capacitor decreases because capacitor discharges through the load,

•☐ At the point when the capacitor voltage surpassed from the pinnacle voltage, at that point forward inclinations gain diodes D2 or D4 and as a Result capacitor star charging again to the pinnacle esteem. This procedure proceeds. Thus we get nearly

Smooth DC voltage as shown in fig (3.7).
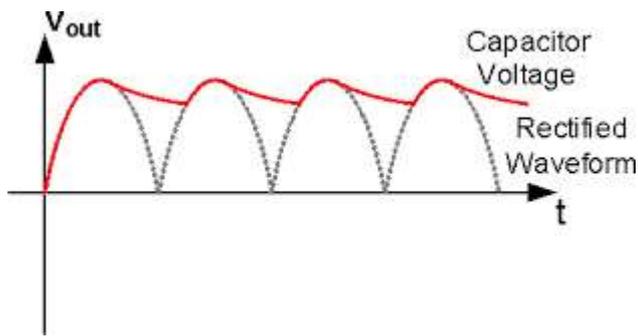
Fig. 3.9 Filtered output

3.3 Discussion about AT mega 328P Microcontroller

In this section we will discuss about ATmega328p Microcontroller the ATmega328P is a low-control CMOS 8-bit microcontroller dependent on the AVR upgraded RISC design. By executing amazing directions in a solitary clock cycle, it has 2kb RAM And 32 kb ROM in which 4kb is for revers boot and other 28kb useable another function it has 16 MHz clock fetch frequency and operation voltage 5v. There are 32 pins in the ATmega328p microcontroller. It has 3 port and each ports has 8 pin other on the other hand it has 2 ground pins. 2 Vcc pins, 2 crystal pins and 1 reset pin and 1 analog reference the ATmega328P achieves throughputs advancing toward 1 MIPS for every MHz allowing the structure expected to streamline control use rather than planning speed The ATmega328P gives the going with features: 4K/8K bytes of In-System Programmable Flash with Read-While-Write capacities, 256/512/512/1K bytes EEPROM, 512/1K/1K/2K bytes SRAM, 23 generally helpful I/O lines, 32 comprehensively valuable working registers, three versatile Timer/Counters with take a gander at modes, internal and outside barges in on, a consecutive programmable USART, a byte-masterminded 2- 2-wire Serial Interface, SPI port, and interrupt system to continue functioning. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next interrupt or hardware reset. In Power-save mode, the asynchronous timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. The ADC Noise Reduction mode stops the CPU and all I/O modules except asynchronous timer and ADC, to minimize switching noise during ADC conversions. In Standby mode, the crystal/resonator Oscillator is running while the rest of the device is sleeping. This

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allows very fast start-up combined with low power consumption. The AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle

The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next interrupt or hardware reset. The device is manufactured using Atmel's high density non-volatile memory technology. The On-chip ISP Flash allows the program memory to be reprogrammed In-System through an SPI serial interface, by a conventional non-volatile memory programmer, or by an On-chip Boot program running on the AVR core.

Fig 3.10. ATMEGA 328

Despite the fact that there are isolated tending to plans and improved pick codes for enroll document and I/O enlist get to, all can even now be tended to and controlled as

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though .They were in SRAM. In the ATMEGA variation, the working register document isn't mapped into the information address space; all things considered, it is absurd to expect to treat any of the ATMEGA's working registers as if they were SRAM. Rather, the I/O registers are mapped into the information address space beginning at the plain start of the location space. Also, the measure of information deliver space committed to I/O registers has developed significantly to 4096 bytes (000016– 0FFF16). Similarly as with past ages, notwithstanding, the quick I/O control directions can just achieve the initial 64 I/O enlist areas (the initial 32 areas for bitwise guidelines). In many variations of the AVR design, this inside EEPROM memory isn't mapped into the MCU's addressable memory space. It must be gotten to a similar way an outer fringe gadget is, utilizing unique pointer registers and read/compose directions which makes EEPROM get to much slower than other inside RAM.

### 3.3.1: Architecture block diagram Atmega328
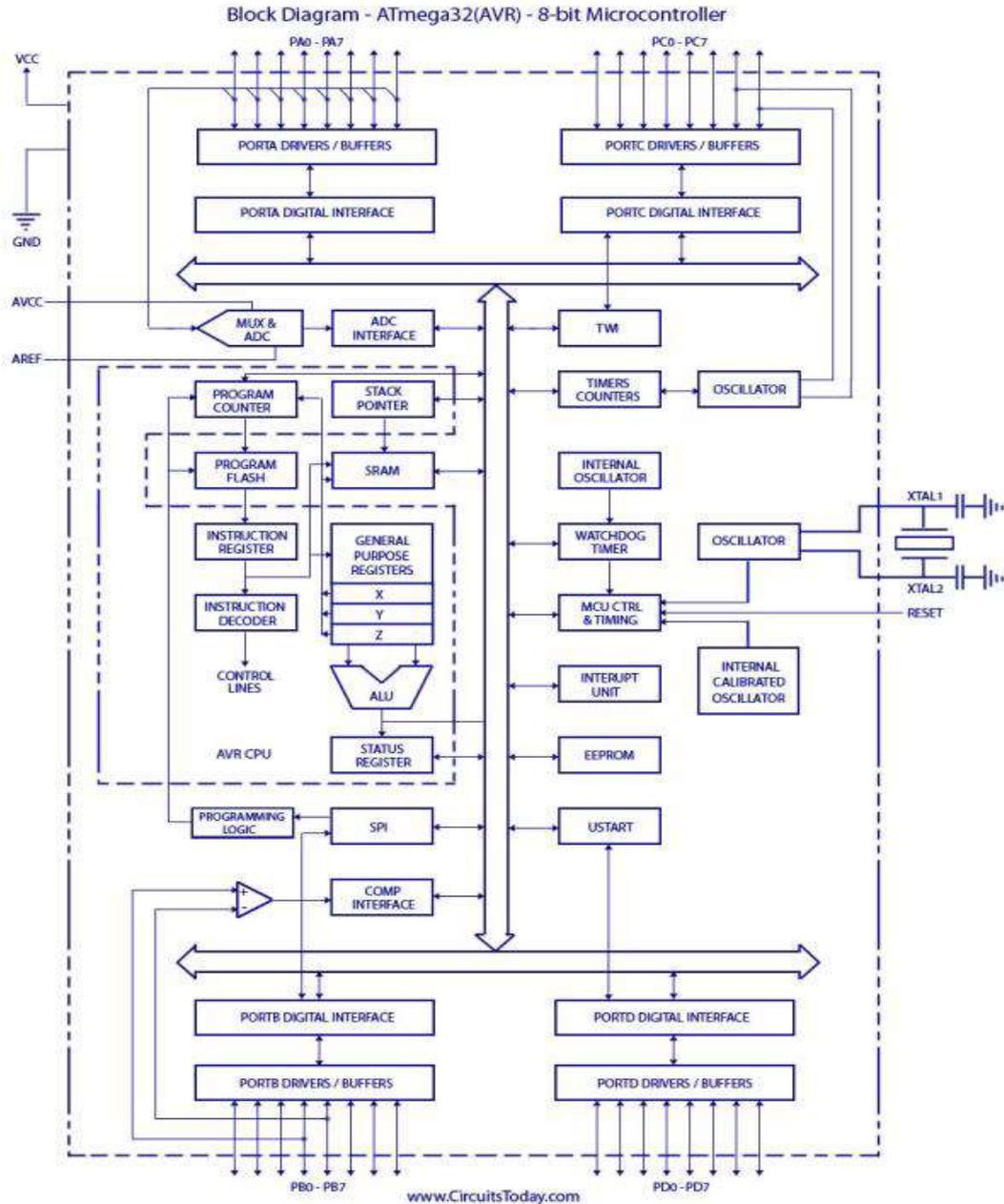
Fig 3.11: Pin configuration

3.4: 12v DC Water Pump

Fig: 3.12 pump

12v dc vehicle glass natively constructed model self-making preparations, with a little siphon can likewise be changed over into different utilizations a little siphon,

RS-360 Mini 4-12v water pumping motor reversible gear aquarium pump RS-360 micro motors small pump,

The centrifugal pump is commonly found inside a submersible fountain pump and some air conditioning units. As the impeller inside it turns, water is drawn in one side of the pump. It is then expelled out the other end. The power and size of the impeller decide the amount of water flow. More water can be pumped if we have a larger impeller. As the impeller rotates, it moves water from the inlet (which is located near the center of rotation of the impeller) along the surfaces of the impeller to the outer portions of the volute by means of centrifugal force (thus, its name centrifugal pump).

As this water collects in the outer regions of the volute, it is directed to the outlet. The water leaving the outlet causes the water pressure to drop at the inlet. To match the rate with which water is leaving the outlet, the pump sucks in new water at the inlet.

These pumps must be primed before starting, which in this case is already done because of its underwater application. Rating Voltage: 12v Dc. Current: 1 amps.

3.4.1 Specification:

1. Model, 360
2. Color, silver + white
3. Quantity 1
4. Material: Iron housing
5. Flow rate 0.5L per minute
6. Suitable voltage: Ac 4-12v
7. Standing voltage: 6v
8. Please avoid long time operation under 12v and longtime no-load testing
9. Absorption range: water pump with air about 1m, over 3m without air
10. Raising range: 0.5
11. power supply verify of Dc power adapter , such as high current battery , normal battery , the power of the router, the recorder power with 6v-9v voltage and 0.8A current.
12. Great for DIY project

Dimension:

2, 56in*1.73in*1.73in (6.5cm*4.4cm*4.4cm)

Weight 2.50 or (71g)

3.5 Connecting Wires

Wire is usually framed by illustration the metal through an opening in a pass on or draw plate. A wire is a solitary, generally tube shaped, adaptable strand or pole of metal. Wires are utilized to endure mechanical burdens or power and media communications signals. The term wire is additionally utilized all the more freely to allude to a heap of such strands, as in 'multi stranded wire', which is all the more accurately named a wire rope in mechanics, or a link in power. Wire measures come in various standard sizes, as communicated as far as a check number.
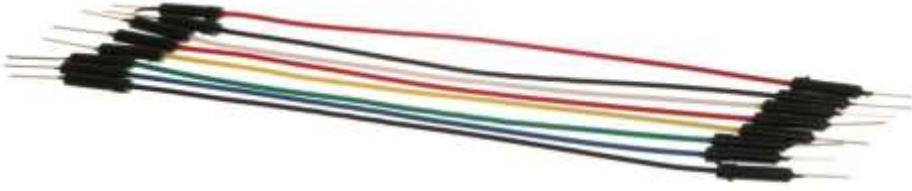
Fig. 3.13 connecting wire

3.6: Soil moisturize sensor

The volumetric water content in soil measure by the moisture sensors. Since the direct gravimetric estimation of free soil dampness requires expelling, weighting and drying of an example, measure the volumetric water content in a roundabout way by utilizing some other property of soil moisture sensors of the soil, such as dielectric constant, electrical resistance, as a proxy for the moisture content. Or interaction with neutrons, soil moisture and the measured property must be calibrated between them.it is depending on many   global parts like soil type, electric conductivity or temperature. The soil moisture effects on Reflecting microwave radiation.at Agricultural and hydrology system is used remote sensing technology. Farmers or gardeners can use Portable probe instruments. By this sensor estimate volumetric water content and Soil moisture sensors typically refer to sensors. Measure another property of moisture in soils by another class of sensors called water potential; these sensors are normally alluded to as soil water potential sensors and incorporate sensitometers and gypsum squares.

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Fig 3.14: Soil moisturize sensor

3.6.1a Identification of various part
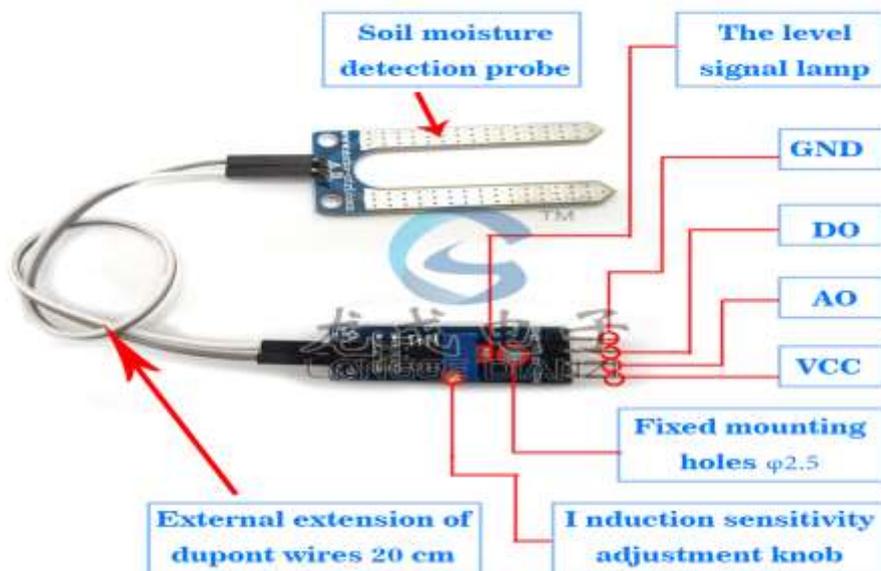
Fig 3.15: Identity Soil moisturize sensor

3.6.1b: Technology

Around the sensors certain volume elements dielectric constant is obtained by measuring the oscillating circuits operating frequency. Time Domain Reflectometry (TDR): The dielectric steady of an explicit volume segment around the sensor is procured by assessing the speed of inciting along a secured transmission line.

- Neutron moisture gauges: to estimate soil moisture content between a source and detector probe the properties of water as a moderator for neutrons are utilized.
- Soil resistivity: to determine the soil moisture content the flow of electricity between two electrodes can be used measuring how strongly the soil resists.

3.6.1c: Application

Agriculture: Bangladesh is a agricultural country. So we need enough irrigation system.so the soil moisture sensor is most essential part of irrigation system .Estimating soil moisture sensor is imperative for agrarian applications to enable ranchers to deal with their water system frameworks all the more proficiently. Knowing the correct soil dampness conditions on their fields, in addition to the fact that farmers are ready to by and large utilize less water to grow a harvest,

Landscape irrigation: Utilizing soil dampness sensors can interface with a water system control in urban and rural territories, scenes and private yards. A basic water system clock will change over it into a "shrewd" by Connected a dirt dampness sensor. At the point when the dirt is as of now wet then water system cycles forestalls by Irrigation controller following an ongoing precipitation occasion.to prevent over-watering and increase the efficiency also leaching of their irrigation systems Golf co uses are using soil moisture sensors of fertilizers and other chemicals into the ground.

Research: this is used various kinds of research applications in agricultural science or natural science including solute transport ponders and as helper sensors for soil breathe measurements. And cultivation including water system arranging, atmosphere look into,

Simple sensors for gardeners: The soil is too dry, wet or moist for plant it's indicate After inserting a probe into the soil for approximately 60 seconds, a meter

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It is simple sensor for gardeners' .it has used simple device and relatively cheap.it need not available require power source for checking whether plants have sufficient moisture to thrive.

3.7: Relay Module of 2 channel 5v

5v 2-channel relay interface board is the low level relay. 15-20mA driver current is needed every channel. The Appliance and equipment which are drive large amount of current these appliance and equipment can be control the relay. This relay works under AC250v 10A or 1oA DC3ov with high current relay .a standard interface has in this relay that microcontroller can control directly.

Fig: 3.16 2 channel relay module

3.7. 1a Property
- AC 250v/10A,DC 30v/10A are the maximum output of this relay
- Opt coupler LOW Level Trigger development board with 2 Channel Relay Module is perfect with arduino.
- Microcontroller can control directly standard interface(TTL logic.MSP430, ARM, DSP, PIC, AVR, 80510
- SPDT relays is high quality loose music relay. One normally close terminal, one normally open terminal, and A common terminal
- Good anti-jamming, isolation is opt coupler.

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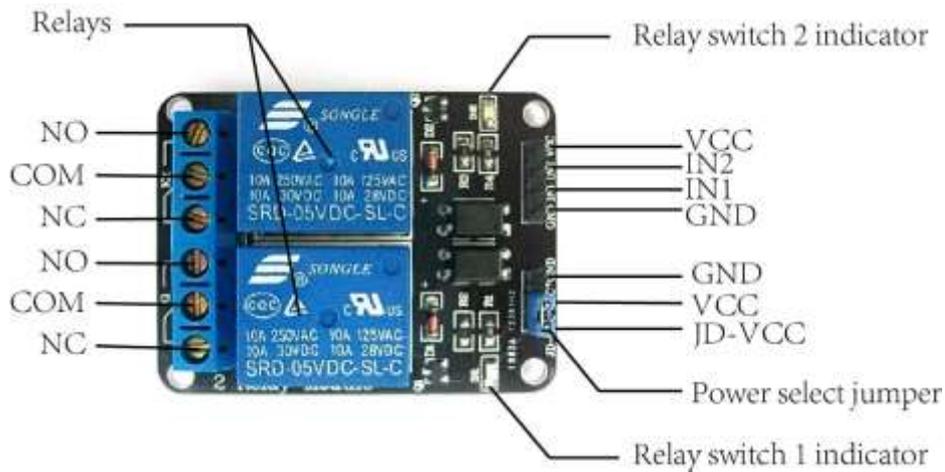
Fig: 3.17 Identity with relay pin

3.7.1b: Designed

The power supply of the relay module are VCC and RY-VCC. When the large power load need to drive any machine, connect an extra power to RY-VCC to supply the relay and you can take the jumper cap off ; the MCU board to supply input signals is connected VCC to 5V .
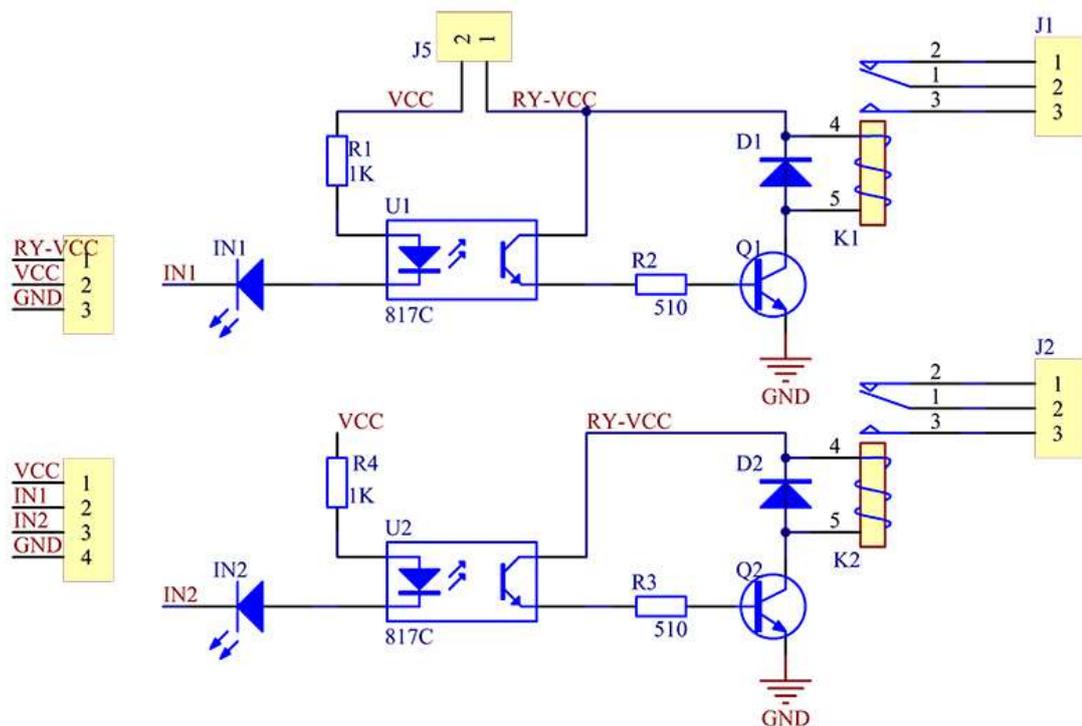

Fig: 3.18 Relay schematic diagram

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3.7.1c Principle

See the image beneath: A define by electromagnet, B is armature, and C is spring, the moving contact is D, and E settled contacts. Two fixed plate has in this relay, an ordinarily shut one and a typically open one. At the point when the loop isn't empowered, the ordinarily open contact is the one that is off, while the typically shut one is the other that is on.
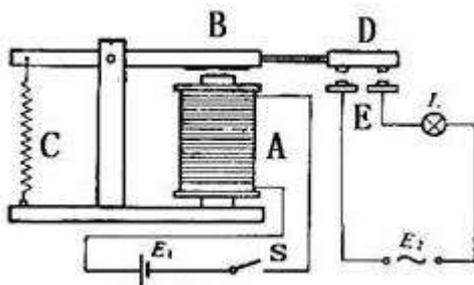

Fig: 3.19 Principle of relay

When the some currents will pass through the coil and add a certain voltage to the coil thus induced the electromagnetic effect. As a results the armature press the tension on the spring and is pulled in deeply, subsequently shutting the moving contact of the armature and the typically open contact. Say discharging the previous and the. After the loop is de-stimulated, at that point the armature moves back to the first position and the electromagnetic power vanishes and, discharging the moving contact and typically shut contact. The power on and off of the circuit is rely upon the end and discharging of the contacts.

Input:

VCC: the supply voltage is connected with positive terminal (supply control as per transfer voltage)

Ground (GND): supply voltage is connected to negative terminal

Input1 (IN1): Signal activating terminal 1 of hand-off module

Input2 (IN2): Signal activating terminal 2 of hand-off module

Output:

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It has one NC (normal close) of each sub-modular, one COM (Common), and one NO (normal open) so it has two NO, two NC and two COM of the channel relay in total. The state without power then NC stands for the normal close port contact; for the normal open port contact No stands and the state with power. COM is the common port. According to whether power or not you can select NC port or NO port.

3.8 Water pot

Features:

- Perfectly suited for use with100lt water tank (MWT-100)
- Helps access tank water
- Durable construction
- Made from recycled plastic

Specification:

- Prouduct dimensions :39.5cm*39cm*31.5cm
- Weight:1.3kg
- Code: MWT-MS
- Color:blue

Fig: 3.20 water pot

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3.9 Jumper wire

The wires can all be used together or easily peeled apart individually or in sections. This is a set of 40 connected female-female DuPont jumper wires. When placed with the silver side out because the slide with the silver showing through the black connector is standard breadboard spacing the fit snug next to each other on a breadboard, (2.54mm) compared to 2.25mm on the other side.

Product contents:

1 jumper wires-40*200(7.8in) is piece female-female

Fig: 3.21 jumper wire

3.10 Summary

The components used are discussed particularly. Explained along with their ratings and connections and discussed various purpose in the system.

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CHAPTER 4

HARDWARE DEVELOPMENT

4.1 Introduction

This chapter will be explaining about the construction of three main section of this project,

i. Power Supply Unit: Explain the construction of a regulated power supply.

ii. The Water irrigation control Unit: Explain the construction of water irrigation control system.

iii. Main Circuit: Take the water moisturize sensor signal as input, compared them and thus control the pump ON/OFF condition.

4.2 Power Supply Unit

The fundamental limit of a power supply is to change more than one sort of electrical Energy to another and, in this manner, control supplies are every so often suggested as electric Power converters. A power supply is an electronic substance that arrangements electric imperativeness to an electrical Load. . Examples of the last consolidate control supplies found in work stations and client devices. Some power supplies are discrete, free contraptions, however. Others are joined with greater devices close by their piles

4.2.1 Representation of a Regulated Power Supply and Block Diagram

This is can be broken down into a series of blocks, each of them perform an individual operation. There are many kinds of power supply which is needed to convert high voltage AC mains electricity to low voltage dc currents for an essential Electronic circuit and other devices.
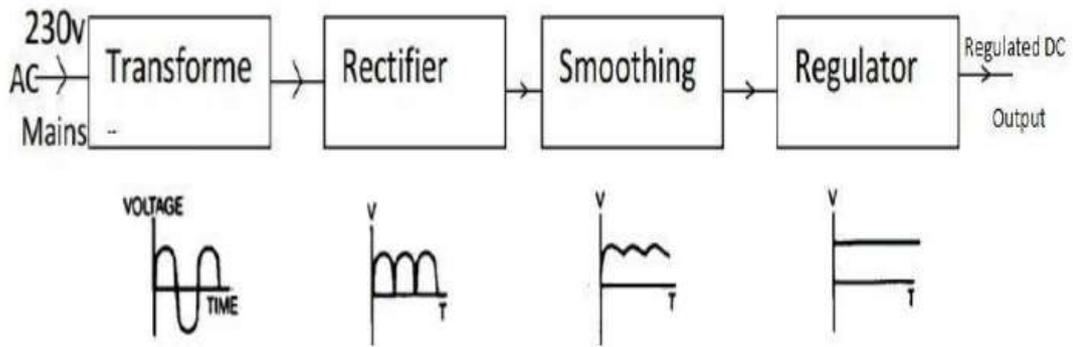
Fig. 4.1 Block diagram of a regulated power supply system

Transformer: it is step down transformer AC to AC (230-12v)

Rectifier: rectifier is an electronic device in which converted into AC to DC using diodes.

Smoothing: Smoothers the DC from fluctuating extraordinarily to a little swell controller dispenses with swell by setting DC yield to a settled voltage.

Controller: A voltage controller is intended to naturally keep up a steady voltage level

4.2.1a Circuit Diagram and Representation of a Regulated Power Supply
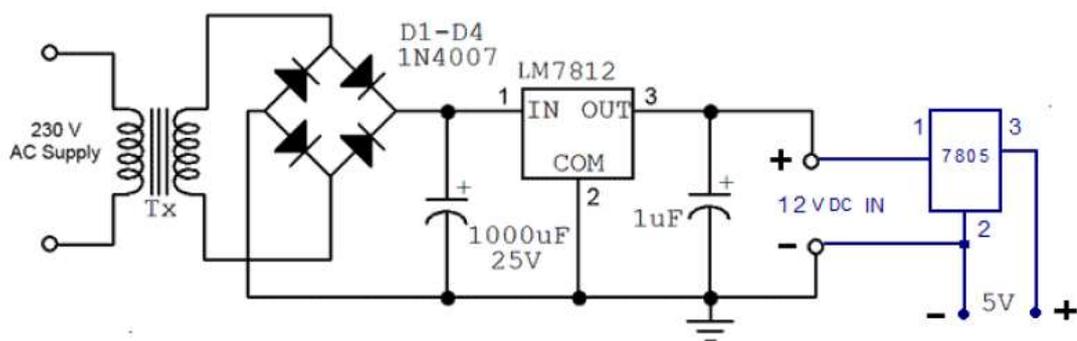

Fig. 4.2 12v-5v DC Regulated power supply circuit

In this circuit is consist a 5V regulated DC supply based on 7805 Regulator IC is shown above. To reduce the voltage level is used A small step down transformer.

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This devices needs. In Bangladesh, single phase 230 volts regulated power supply circuit is available. Pulsating sinusoidal AC voltage is the output of the transformer, Using the rectifier can converted to pulsating DC. To reduce the AC ripples, and passes the DC components has used a filter circuit with output.

4.3 Circuit Diagram and Construction
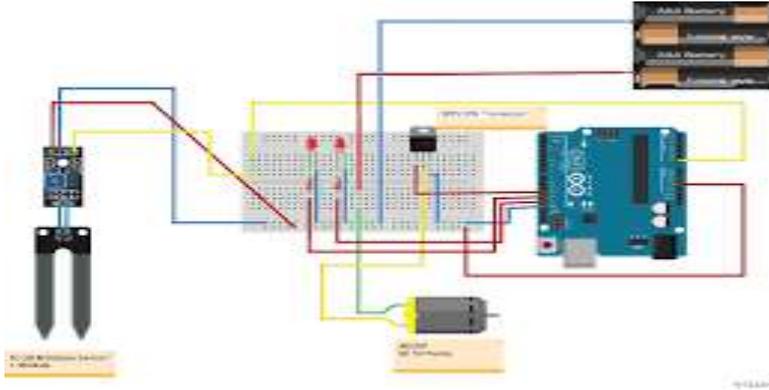
Fig: 4.3 circuit diagram

In this project use moisture sensor including amplifier circuit by which send a signal to Arduino as a input. Two adapter used for power supply 1 Adapter supply power to the Arduino and another supplies power to relay

In this project is used two functional components. They are the motor/water pump and the moisture sensors. Following schematic diagram connected to moisture sensor and motor driver with motor pump. A 9 volt battery is used for driving the motor, and the battery life is shown by measurement the current. Using the Arduino IDE software the Arduino Board is programmed. The temperature level of moisture in the soil measures by moisture sensor and if watering is required then sends the signal to the Arduino. The plants until the desired moisture level is being reached by the motor/water pump supplies water.

Table 4.1 Parts list of water irrigation system

Arduino UNO R3	1p
Soil Moisture Sensor-	1p
2Channel 5v Relay-	1p
12v DC Water Pump	1p
Water Pipe	1p
Soil With Soil Pot	1p
12 V Dc Adapter	1p
9v Dc Adapter	1p
Two Pin Plug	1p
Transformer (12v,1A)	1p
PCB board	1p

4.4 Complete Hardware Setup

Fig. 4.4 Complete hardware setup

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4.5 Working principle

Behind this system the soil moisture sensor is connected the circuit this the main working principle in this plant, which was earlier embedded into the plant, other electronic components listed above as shown in Figure 4.4 which are also connected to t the Arduino Microcontroller. The soil moisture to the microcontroller which controls the pump when Measurement of soil moisture is done by the sensor which forwards the information and parameters regarding. The sensor connected with Microcontroller when the soil moisture drops below a certain value. Then the relay module get a signal from the microcontroller as a results start the pump and necessity amount of water supplied to the plant .when the needed water is supplied, the pump stops its Action.

Power supply has an undertaking to control the entire framework and the prescribed voltage should regard the info supply go for the microcontroller, that is, from 7V to 12V. Hand-off module is a basic circuit comprising of a solitary transistor, a few resistors, diodes and a hand-off and it is controlled carefully by microcontroller. Arduino Nano is a perfect microcontroller for this purpose because of its dimensions and its work performance since the complete system should be embedded in a small box, this is consist the two parts: probes and amplifier circuit. Analog and digital outputs has in this module, the threshold is activated where digital output logical 1 is set. When. Potentiometer is set the threshold. The real time and regarding information given by Analog output. This output and the moisture in the plant is used in the system. With relay module, Water pump is connected. When the microcontroller gives a command to relay module then works the water pump, we can write its working principle from flow chart when soil temperature is below then soil moisture sensor send a signal to microcontroller then microcontroller gives a command to relay module then starts the motor pump otherwise stop the motor.
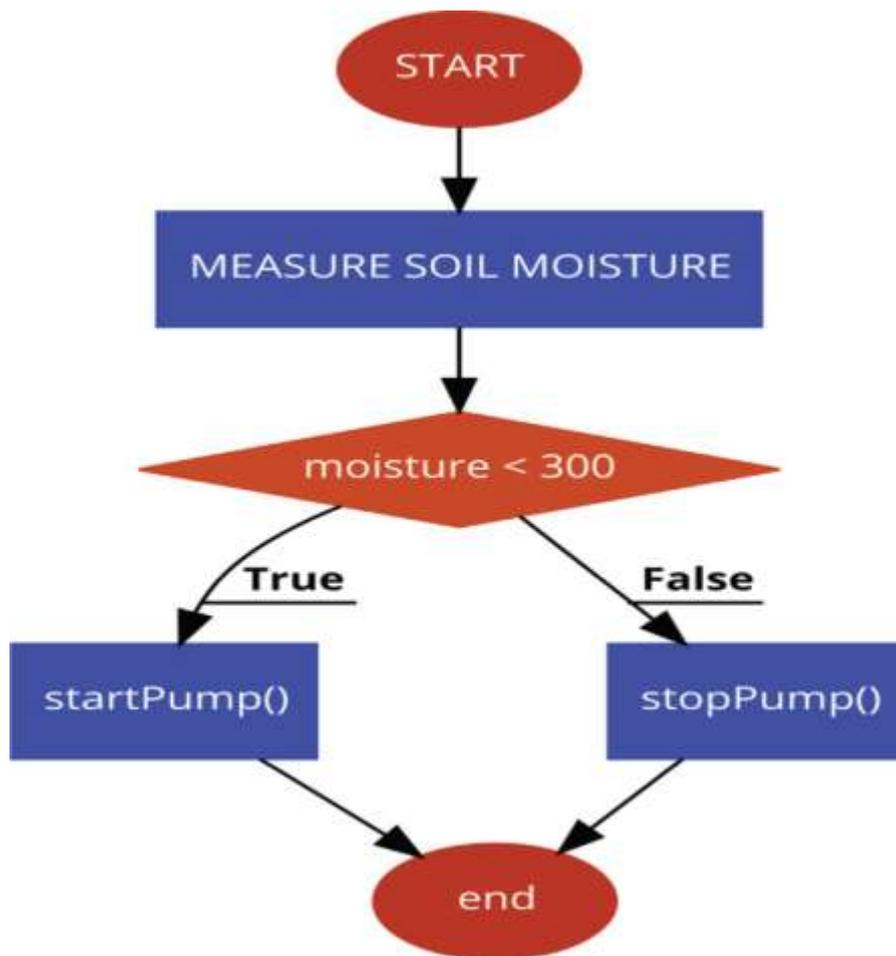
Fig.4.5. Flow chart diagram of microcontroller

4.6 Summary

A circuit diagram (electronic schematic, electrical diagram, fundamental layout,) is a graphical depiction of an electrical circuit. The presentation of the interconnections between circuit sections in the schematic diagram does not by any means identify with the physical approaches in the finished device. A pictorial circuit plot uses essential pictures of parts, while a schematic diagram exhibits the sections and interconnections of the circuit using regulated symbolic depictions.

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CHAPTER 5
RESULTS AND DISCUSSIONS

5.1 Introduction

In this section is discussed about results of works. We can see the flow chart the when the soil temperature has gone below then the pump only start the point and when the soil temperature has reach minimum to the point the pump will be stop. The system operate on using several possibilities and including power

5.2 Results

According to the circuit diagram the experimental model was made and the results were as prospective. When the OHT was about to go dry the motor pump switched ON and switched OFF when the OHT was about to overflow. We can see the figure 5.1 below this is based on the Arduino microcontroller and sensor technology. The system has been designed and tested successfully in a successful manner. Represents results of our experiment in the form of the overall representation of our tested automatic plant watering system. As it can be concluded from the picture below,

The system is also functionality, the overall behavior as well as of the plant, has been observed in the next 1 weeks as a results we have got expected and required results. As result of our observation we noticed that plant maintained its homeostasis in desired, without any deficiencies observed with Regular and health manner. When need the water the sensor sent a signal to microcontroller after that microcontroller sent a signal to the pump to until enough quantity of water was not delivered, Start watering the plant.
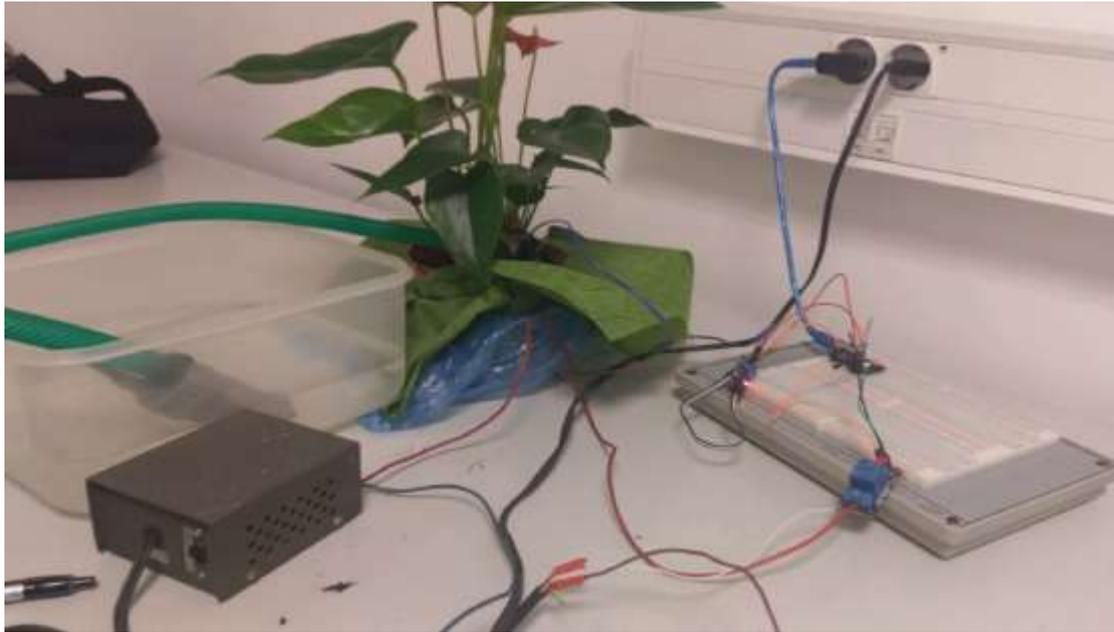
Fig. 5.1. Plant watering system and Testing

5.3 Advantages of this plant

Reduced labor: here no need many labor for working. Because it works automatically. Only one labor is required in the system.

Life style will improved: since it works automatically .so no need check the water progress again and again. The motor no need start and stop by any person. So the people can sleep through the night and live relax with a family.

More timely irrigation: when the plants need water that time Irrigators with automation are more inclined to irrigate, not when it suits the irrigator.it works perfect timely

Assists in the management of higher flow rates: the irrigation flow rate want to increase by the many irrigators. They receive through installing bay outlets and bigger channels. Such flow rates require an increase in labor as the time taken to irrigate a bay is reduced thus requiring more frequent change over. Automation allows for these higher flows to be managed without an increase in the amount of labor.

Most perfect cut-off: when the sufficient water is delivered to the land then automatically cut-off it. Automation of the irrigation system allows cut-off of water at the appropriate point in the bay. This is usually more accurate than manual checking

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because mistakes can occur if the operator is too late or too early in making a change of water flow.

Decrease nutrients and runoff of water: Holding compost on ranch has both monetary and natural advantages. Mechanization can help keep manure on ranch by adequately diminishing keep running off from the property.

Decrease costs of used irrigation vehicles: As the irrigator is not required to constantly check progress of an irrigation, motor bikes, four wheelers and other vehicles are used less. Since we can give water supply in right time so this reduces the running costs of these vehicles and they require less frequent replacement.

5.4 Disadvantages

Cost: there are various costs like installing, maintaining automatic and purchasing cost.

Equipment Reliability: as an automatic system sometimes it does not work accurately failures will occur. This is occurs by human error in setting and it's maintain system. To collect any excess runoff when failures occur by a re-use system is good insurance

Maintaining channel Increased: There is a need to expand support of channels and hardware to guarantee the framework works accurately. Channels ought to be fenced to shield the programmed units from stock harm.

5.5 different kind of Automatic irrigation system

Pneumatic system: a bay sensor located at the cut-off point activate a permanent system is called pneumatic system. When water enters the sensor, it pressurize the air, which is piped to a mechanism that activates the opening and closing of irrigation structures.

Portable timer system: this is used electronic clocks to activate the opening and closing of the irrigation structures. And portable timer system is a temporary system. Landowners usually buy 4 or 5 units to move around the whole property. Because of its portable nature.

Timer/ Sensor Hybrid: this framework is a half breed of compact clock and sensor frameworks. It utilizes an electronic gadget to initiate the opening and shutting of the water system structures this framework has an extra element of the irrigator having the

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capacity to put a moveable sensor down the cove. . Like a versatile clock, when interacts with water, transmits radio signs to the clock gadgets at the outlets to open or close the structures and sends a radio message to a collector to tell the landowner water has achieved the chopped off focuses down the inlet.

SCADA: Computerization frameworks that utilization Supervisory Control and Data Acquisition (SCADA) comprise of a PC and programming bundle to timetable and control water system by means of a radio connection. Signs are sent from the PC to control modules in the enclosure to open and close water system structures with straight actuators. Inlets are opened and shut on a period premise, a few frameworks have the ability to consequently change the time a narrows outlet is open if the channel supply is conflicting. SCADA based frameworks have the extra advantage of having the capacity to begin and stop water system siphons and engines.

5.6 Cost Estimation of the Project

Table 5.1 Cost Estimation

Sr. No.	Particulars	Cost in TK
01	Arduino UNO R3- 1 p	450
02	Soil Moisture Sensor-1p	250
03	2 Channel 5v Relay-1p	250
04	12v DC Water Pump-1p	350
05	Water Pipe	60
06	Soil With Soil Pot-1p	100
07	Water Tank-1p	120
08	Pvc Board	120
09	Jumper Wires	60
10	12 V Dc Adapter-1p	120
11	12v Transformer	150
12	Two pin plug	20
	Total cost	2050

The auxiliary components of the system are Centrifugal submersible pump and relay. As a part of the control circuit these are not considered. According to load connected to the system varying cost and ratings of the pump. A larger pump will have to use when increase the load. As a results, increase the current flowing through the circuit. Therefore, a higher rated relay we would require. For our project, we had to pump a small volume of water for demonstration purpose so we used a low rated pump.

5.7 Discussion

Extraordinary and expected aftereffects of our investigation were finished up from the way that our plant has effectively maintained a strategic distance from lack of hydration and continued developing with no issues

Furthermore, lacks, because of the sensor that is inserted inside the plant estimating the dirt dampness level and controlling the water siphon. The framework deals with the rule of estimating the dirt dampness level by methods for the sensor innovation which thus controls the water siphon by means of microcontroller with the end goal to give the plant enough measures of water when essential. Next couple of sections talk about the conceivable utilizations of this framework. Computerized plant watering framework can be utilized to understand numerous issues on the planet giving both restricted and wide applications and arrangements, where for the previous there is a case of robotized watering of plant at whatever point somebody takes some time off and disregards plants at home, which empowers the plants to get the correct measure of required water and counteracts unpredictable watering which prompts mineral misfortune in the dirt; and for the last application, there is a case of utilizing this framework for restorative and rural purposes to take care of some greatest human-related issues like undernourishment, air contamination and event of respiratory illnesses. Being perfect for reasons for having huge patio nurseries, estates or explicit plants with possess watering needs, this framework can be extremely useful in agribusiness to keep vegetable plants watered for greater gather with negligible misfortune because of water vanishing and spillover.

CHAPTER **6**

CONCLUSIONS

6.1 Conclusions

Thus the "**ARDUINO BASED AUTOMATIC PLANT WATERING SYSTEM**" has been designed and tested successfully. The hardware components and of all integrated features has used to developed the system. All of the Presence of each module has been placed carefully and reasoned out, as the unit can contribute for best working. Thus, Watering System of the Arduino Based Automatic Plant has designed and tested successfully. Automatically tested the function of this system. The moisture level (water content) of the different plants measured by the moisture sensors. The moisture sensor sends the signal to the Arduino board when the moisture level is found to be below the desired level, and triggers the Water Pump to turn ON and supply the water to respective plant using the Rotating Platform/Sprinkler. At the point when the coveted dampness level is achieved, the framework ends without anyone else and the Water Pump is killed. Consequently, the usefulness of the whole framework has been tried altogether and it is said to work effectively.

6.2 Limitations of the Work

It is significant to know that in this design we used metallic contacts as sensor which is becomes rusty in the presents of water and makes the sensors less sensitive. So we need to clean the sensors after certain time period.

a. Start motor when soil will be dry

b. It cannot Soil water measurement

c. Soil water balance

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6.3 Future scopes of the Work

To reduce much of human labor and at the same time minimize on water usage Agricultural monitoring is very much needed. Predicting the soil condition for irrigating and Wireless Sensor in monitoring the field for Lot of system been developed employing. Moreover machine learning strategies been utilized product sickness expectation just and towards harvest yield. Presently with the appearance of Machine to Machine correspondence (M2M) which includes gadgets to impart among themselves in making a move, we here have built up a condition for watering the field this water system framework was observed to be possible and financially savvy for upgrading water assets for horticultural creation. The water system framework can be acclimated to an assortment of explicit yield needs and requires least support. In addition, the Internet interface allows the supervision through adaptable media transmission contraptions, for instance, a Smartphone. Other than the cash related save assets in water use, the noteworthiness of the preservation of this normal resource legitimize the use of this kind of water framework structure. there are numerous different conceivable outcomes like making complex associations of plants of comparable assortment or alleged Internet of Plants Also, Although it is by all accounts all the more requesting and testing, utilizing more than one sensor is another thought for a trial adventure, yet there are additionally numerous other trial and test like thoughts, for example, clock for setting water system framework utilizing sun oriented power supply and so forth. Nonetheless, autonomously of the route used to build it, there is no uncertainty that this framework can be exceptionally useful in taking care of numerous issues, from those that appear to be innocuous to those that are on the size of the most vital and most risky ones for human populace. By means of this system, from the process of watering the plant that is possible to control the amount of water released. Despite the fact that it very well may be extremely useful for mankind when all is said in done, botanists, agriculturists, and experts, are the general population who could have the greatest advantage of utilizing this framework

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APPENDIX

```
int ACWATERPUMP = 13;

Int sensor = 8;

int val; //This variable stores the value received from Soil moisture sensor.

Void setup() {

  pinMode(13,OUTPUT); //Set pin 13 as OUTPUT pin, to send signal to relay

  pinMode(8,INPUT); //Set pin 8 as input pin, to receive data from Soil moisture sensor.

}

void loop() {

 val = digitalRead(8);  //Read data from soil moisture sensor

 if(val == LOW)

 {

 digitalWrite(13,LOW); //if soil moisture sensor provides LOW value send LOW value to relay

 }

 else

{digital /Write(13,HIGH); //if soil moisture sensor provides HIGH value send HIGH value to relay

 }

 delay(400); //Wait for few second and then continue the loop.

 }
```

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