Title of the project:

Automatic Irrigation system using Arduino

Abstract:

An Automatic Irrigation system is quite a necessity if you have a backyard or garden. Irrigation systems offer many benefits. Not only do they help with lawn maintenance, they also help you bring down your water bill. It so happens that most property owners end up using way more water than they should, to keep the grass and the landscape looking good. This is not only a burden on their finances, but, also on the available water resources, which, to be honest, are few in number.

Irrigation systems overcome this problem by managing the watering needs of your lawn with more efficiency. Apart from uniform irrigation, these systems provide the exact amount of water your plants need. Therefore, there is almost no wastage at all. And the benefits don't end there - irrigation systems also save time because you don't have to manually water your lawn or garden.

Components Required:

S.No.	Components	Online Link	Price
1.	Arduino Uno R3	http://amzn.to/2srIMT3	₹650
2.	Soil moisture sensor	http://amzn.to/2sQLiCJ	₹90
3.	Buzzer	http://amzn.to/2sXK2sz	₹250
4.	4 Channel Relay	http://amzn.to/2s09f8s	₹165
5.	Jumper wires	http://amzn.to/2s9wfkc	₹500

Description about the components:

Arduino Uno R3

The brain behind the entire circuit is an. The UNO is popular among beginners because it's easy to use and also, because of how strong and durable it is. The UNO is based on ATmega328P and comes with 14 digital pins each for output and input. 6 of these pins also double as PWM outputs. Other than that, you have 6 analog inputs, a USB connection, a 16 MHz clock, a power jack, and a reset button.

Soil Moisture Sensor

In this particular build, we'll be using the one manufactured by Sparkfun. The moisture sensor has one job to do – measure the moisture levels in the soil. This particular sensor returns values from 0 to 1023; 0 meaning very dry and 1023 meaning very moist. The moisture sensor can trigger the irrigation system once it detects low moisture levels. With the right programming, the system can either water your garden at specific times of the day using the RTC or according to the moisture levels in the soil using the soil moisture sensor. Another option is to combine the two - program the system to water your plants at a certain time but also turn on if the soil gets too dry during the day.

Piezo buzzer

Piezo buzzer is a loudspeaker that uses the piezoelectric effect for generating sound. The initial mechanical motion is created by applying a voltage to a piezoelectric material, and this motion is typically converted into audible sound using diaphragms and resonators.

4 Channel Relay for Arduino

This is a 5V 4-channel relay interface board, and each channel needs a 15-20mA driver current. It can be used to control various appliances and equipment with large current. It is equipped with high-current relays that work under AC250V 10A or DC30V 10A. It has a standard interface that can be controlled directly by microcontroller.

Jumper wires

used in electrical circuits to connect various components.

Working:

we are going to connect a relay and water motor to the Arduino. We will then write a program to take input from soil moisture sensor and switch on or switch off the water motor based on the data received from soil moisture sensor.

Working Video: https://drive.google.com/open?id=1sOGve_O6HZ1fvbtNvk8ruA0-C7-olC2w

Code

```
int ACWATERPUMP = 13; //You can remove this line, it has no use in the program.
int sensor = 8; //You can remove this line, it has no use in the program.
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,HIGH); //if soil moisture sensor provides LOW value send LOW value to relay
  }
  else
  {
  digitalWrite(13,LOW); //if soil moisture sensor provides HIGH value send HIGH value to relay
  }
  delay(400); //Wait for few second and then continue the loop.
}
```