

IOT BASED SMART WATER FOUNTAINS...

PHASE_2 : INNOVATION

ARDUINO CONTROLLED WATER FOUNTAIN USING SOUND SENSOR.

The basic idea of this Arduino Water Fountain is to take an input from any external sound source like mobile, iPod, PC etc., sample the sound and break it down to different voltage ranges, then use the output to turn on various Relay. We first used a condenser mic based sound sensor module to perform on the sound source to split the sounds into different voltage ranges. Then the voltage will be fed to op-amp to compare sound level with a particular limit. The higher voltage range will correspond to a relay switch ON which comprises a musical water fountain operating to the beats and rhythms of the song.

SMART WATER FOUNTAINS:

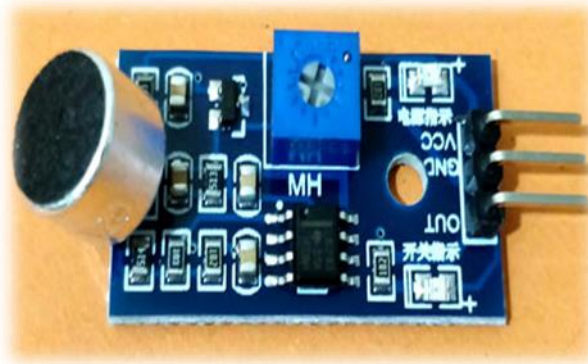
If you are not at home ,you don't have to rush back to give them fresh water . Simple use the Tesla smart Mobile app to run the fountain from wherever you are. And if you want to make this pleasant duty even easier, just automate the entire process in the app.

MATERIAL REQUIRED:

- 1.Arduino Nano
- 2.Sound Sensor Module
- 3.12V Relay Module
- 4.DC Pump
- 5.LEDs
- 6.Connecting Wires
- 7.Vero board or Breadboard

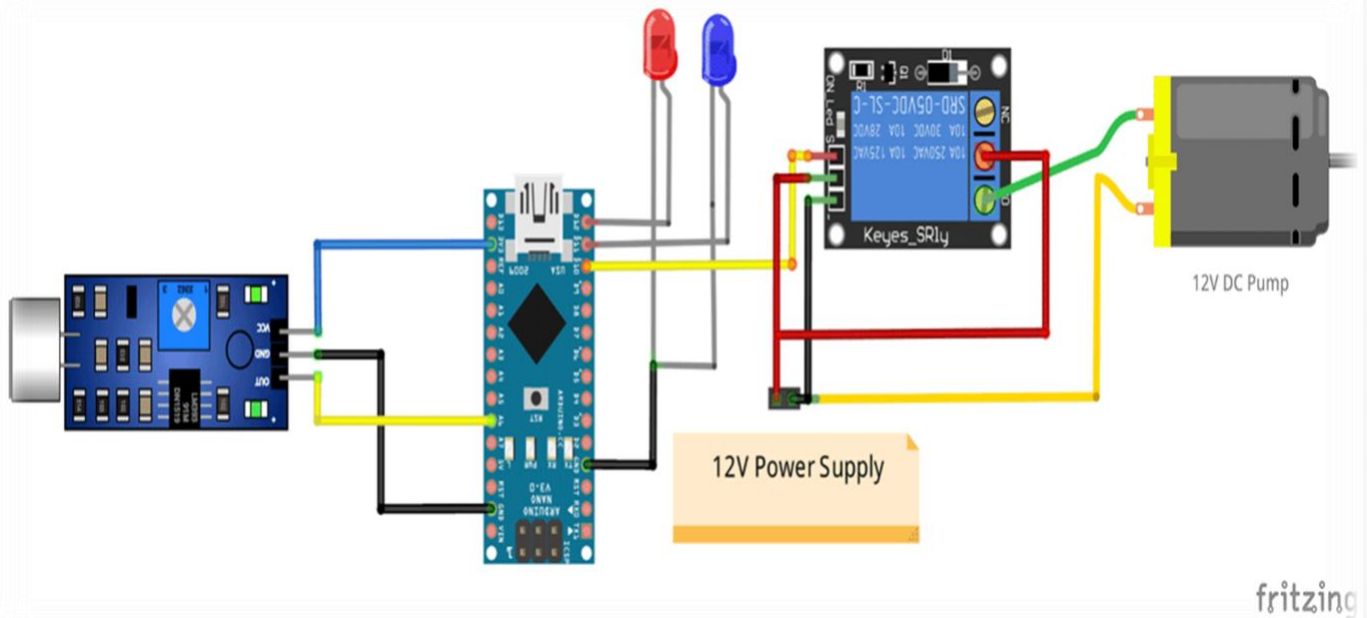
DESIGN FEATURES:

We add for this project sound sensor . The Sound sensor module is a simple electret microphone based electronic board used to sense external sound from the environment. It is based on the LM393 power amplifier and an electret microphone, it can be used to detect whether there is any sound beyond the set threshold limit. The module output is a digital signal which indicates that the sound is greater or lesser than the threshold.



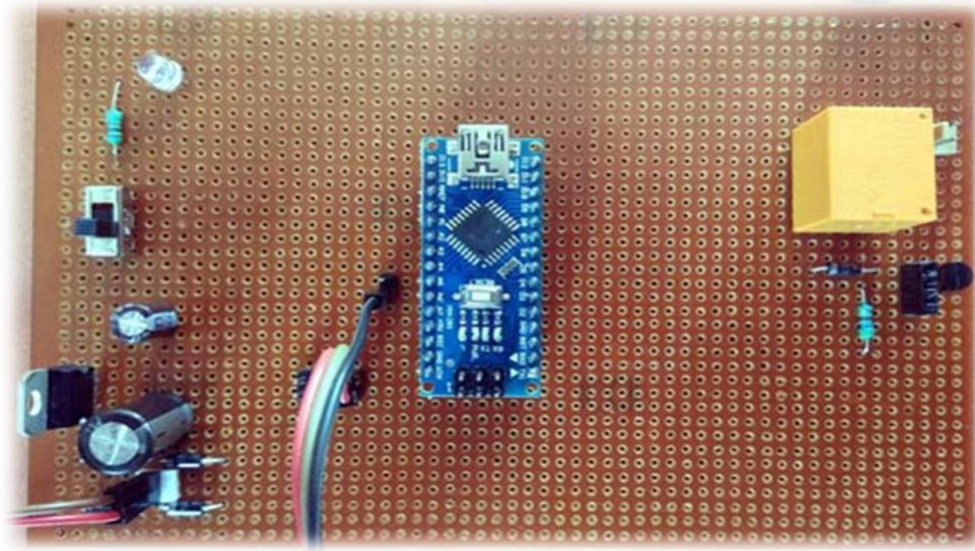
SOUND SENSOR

WATER FOUNTAINS CIRCUIT DIAGRAM:



As shown in the above water fountain circuit diagram, the sound sensor is powered with 3.3V supply of Arduino Nano and the output pin of the sound sensor module is connected to the analog input pin (A6) of Nano. You can use any of the analog pin, but make sure to change that in the program. The relay module and DC pump is powered by an external 12VDC power supply as shown in the figure. The input signal of relay module is connected to digital output pin D10 of Nano. For lighting effect I chose two different colours of LED and connected them to two digital output pins (D12, D11) of Nano.

Here the Pump is connected in such a way that when a HIGH pulse is given to the input of Relay module, the COM contact of the relay is get connected to the NO contact and the current gets a closed circuit path to flow across the pump to activate the water flow. Otherwise the pump will remain OFF. The HIGH/LOW pulses are generated from Arduino Nano depending on the sound input.



Programming Arduino Nano for water Fountain:

The complete program of this Arduino water fountain project is given at the bottom of the page. But here I am just explaining that by parts for better understanding:

The first part of the program is to declare the necessary variables for assigning pin numbers that we are going to use in the next blocks of program. Then define a constant REF with a value which is the reference value of for the sound sensor module. The assigned value 700 is the bytes equivalent value of the output electrical signal of the sound sensor.

```
int sensor = A6;

int redled = 12;

int greenled = 11;

int pump = 10;

#define REF 700

void setup()
{
  pinMode(sensor,INPUT);
  pinMode(redled,OUTPUT);
  pinMode(greenled,OUTPUT);
```

```
pinMode(pump,OUTPUT);  
}  
void loop()  
{  
  int sensor_value = analogRead (sensor);  
  if (sensor_value>REF)  
  {  
    digitalWrite(greenled,HIGH);  
    digitalWrite(redled,HIGH);  
    digitalWrite(pump,HIGH);  
    delay(70);  
  }  
  else  
  {  
    digitalWrite(greenled,LOW);  
    digitalWrite(redled,LOW);  
    digitalWrite(pump,LOW);  
    delay(70);  
  }  
}
```