LILI the sugar DISPENSER machine

**ABSTRACT:**  Generally we are using sugar packets, so that sugar wastage and no of sugar packet waste will occur. we use two hands to tear the packets this is quite difficult for very busy person to do, to reduce this problem we are introducing “**LILI” the Sugar Dispenser machine** it will give more accurate sugar quantity and easy to use.

**AIM**: It can pour accurate sugar quantity so that it can minimize wastage of sugar. It is a **Robust Design** for the sugar dispenser machine.

**EXPLANATION:** LILI machine has made of fully wooden blocks, in this machine we are using screw conveyor to feed the sugar, this screw conveyor we done in the 3d printing. This machine is very easy to handle, we installed ultrasonic sensor. By showing your hand signal to nearby sensor (with in a 20 cm). By talking this signal, it will send to the Arduino then the Arduino will give the permission to the servomotor (continuous servomotor) to run.

**STEP 1:**

**MATERIALS REQUIRED :**

1. Arduino Uno

2. 360-degree servo motor

3. HC-SRO4 Ultrasonic Sensor

4. Wooden Blocks

5. Jumper wires

6.Bread board

7.Sugar Box

8.3D print screw conveyor

9.PVC pipe and T shape PVC

10.Drilling machine

11.Screws

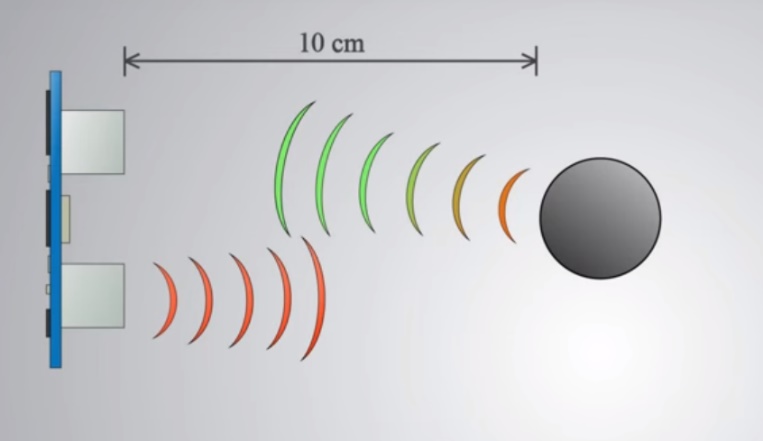
12.Funnel

13.Powder adaptor charger

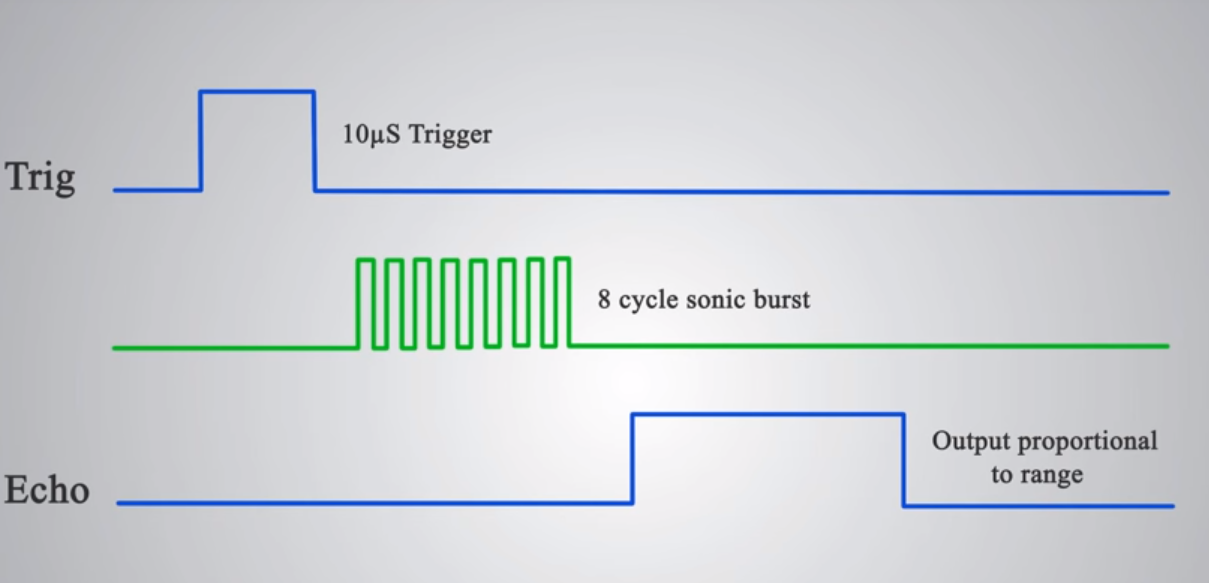
**STEP 2**:

How It Works – Ultrasonic Sensor

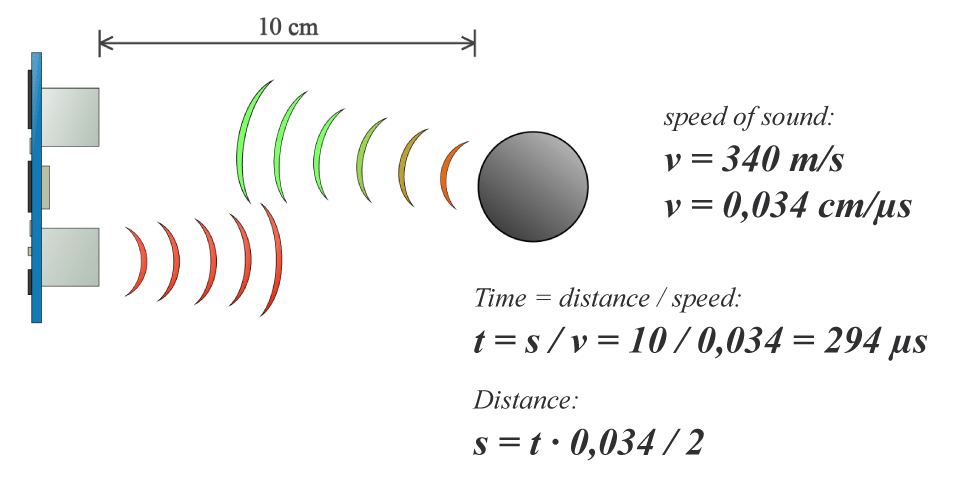
It emits an ultrasound at 40 000 Hz which travels through the air and if there is an object or obstacle on its path It will bounce back to the module. Considering the travel time and the speed of the sound you can calculate the distance.



The HC-SR04 Ultrasonic Module has 4 pins, Ground, VCC, Trig and Echo. The Ground and the VCC pins of the module needs to be connected to the Ground and the 5 volts pins on the Arduino Board respectively and the trig and echo pins to any Digital I/O pin on the Arduino Board.In order to generate the ultrasound you need to set the Trig on a High State for 10 µs. That will send out an 8 cycle sonic burst which will travel at the speed sound and it will be received in the Echo pin. The Echo pin will output the time in microseconds the sound wave travelled.

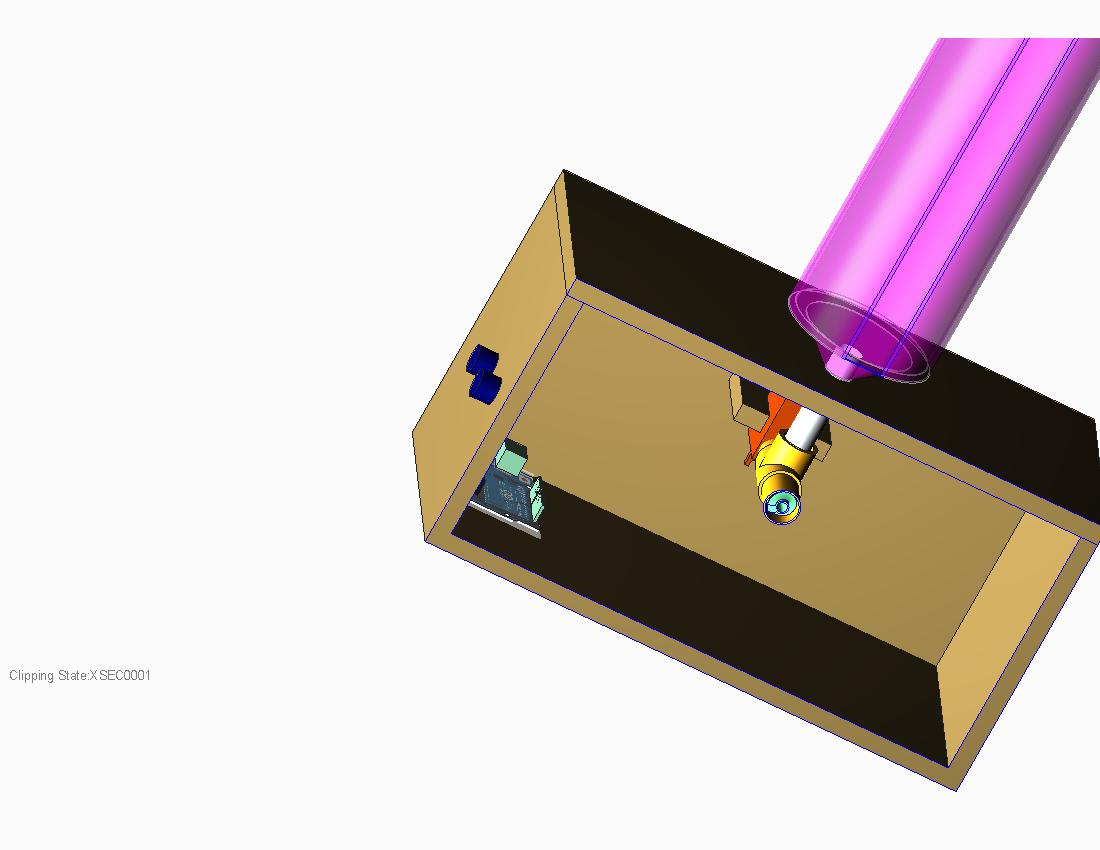


**For example**, if the object is 10 cm away from the sensor, and the speed of the sound is 340 m/s or 0.034 cm/µs the sound wave will need to travel about 294 u seconds. But what you will get from the Echo pin will be double that number because the sound wave needs to travel forward and bounce backward.  So, in order to get the distance in cm we need to multiply the received travel time value from the echo pin by 0.034 and divide it by 2.

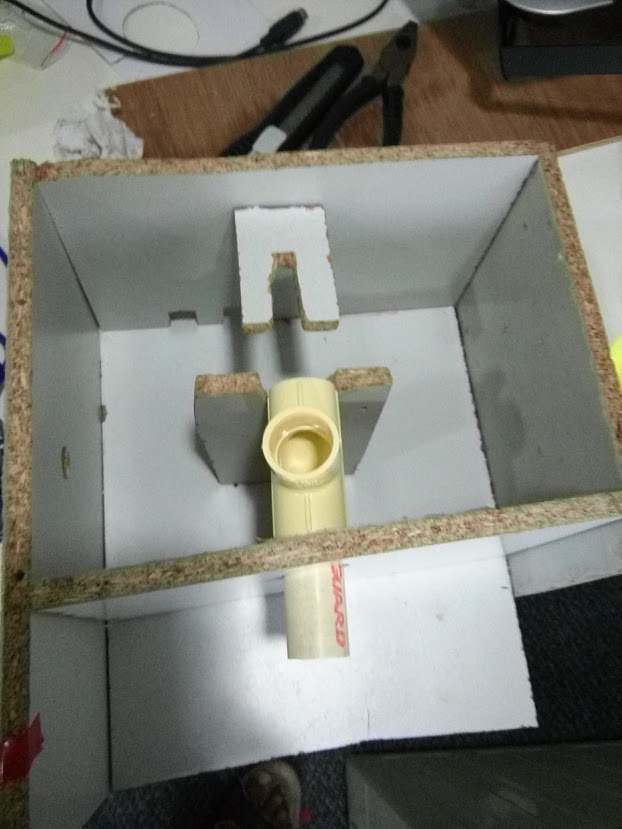
[](http://howtomechatronics.com/wp-content/uploads/2015/07/Ultrasonic-Sensor-Equasions.png?x57244)

**STEP 3:**

As per the Above principle we should know how much distance you are giving the signal. According the signal you will develop the prototype model. In my case I will give the signal with in the 20-cm distance, now built the prototype model using wooden blocks.

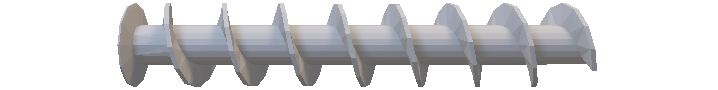


**CAD MODEL** as per this I developed model.



**STEP 4:**

**Built screw conveyor 3D print part**

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1.Flow direction of screw conveyor is Right hand  
2.anticlockwise (motor) direction

The above 2 conditions very imported for the sugar feeding or flow

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3d PRINT PART

**STEP 5: Installation**

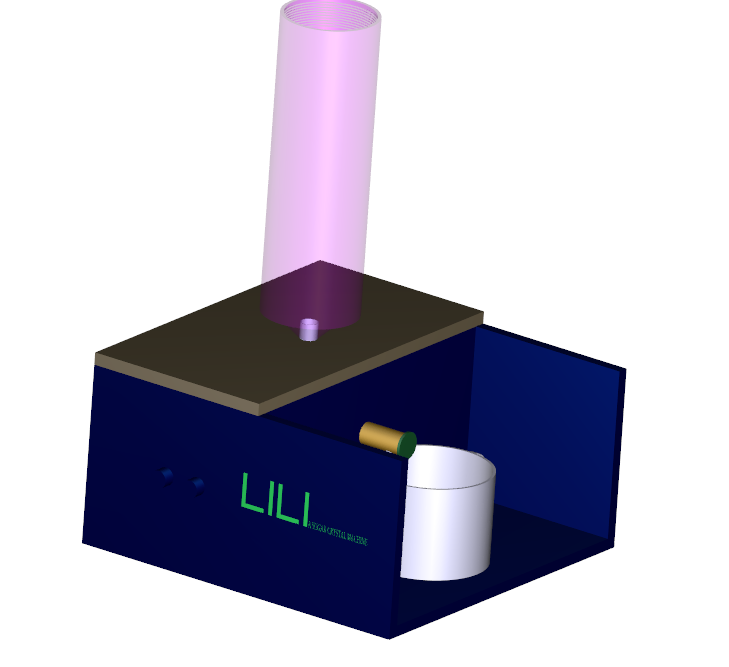
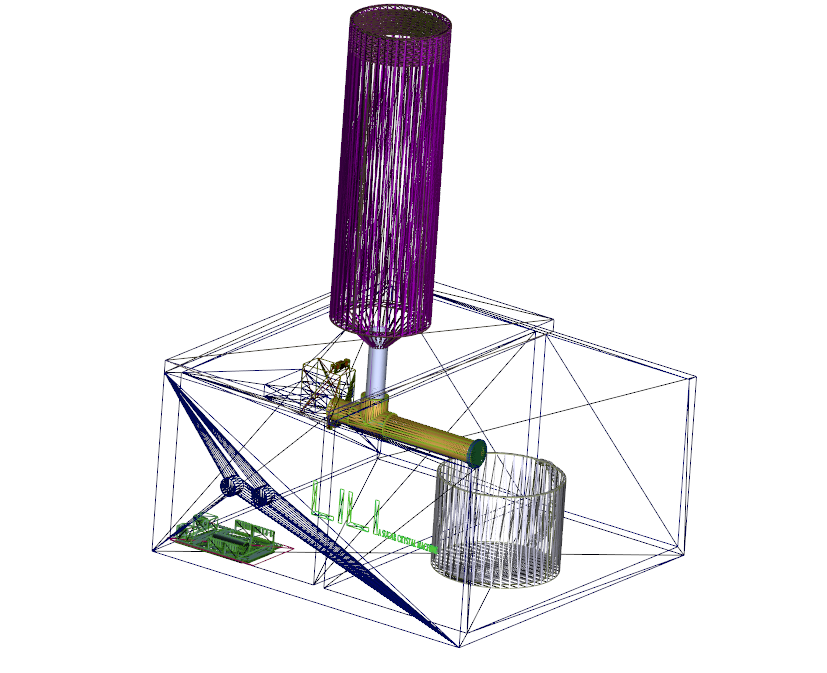
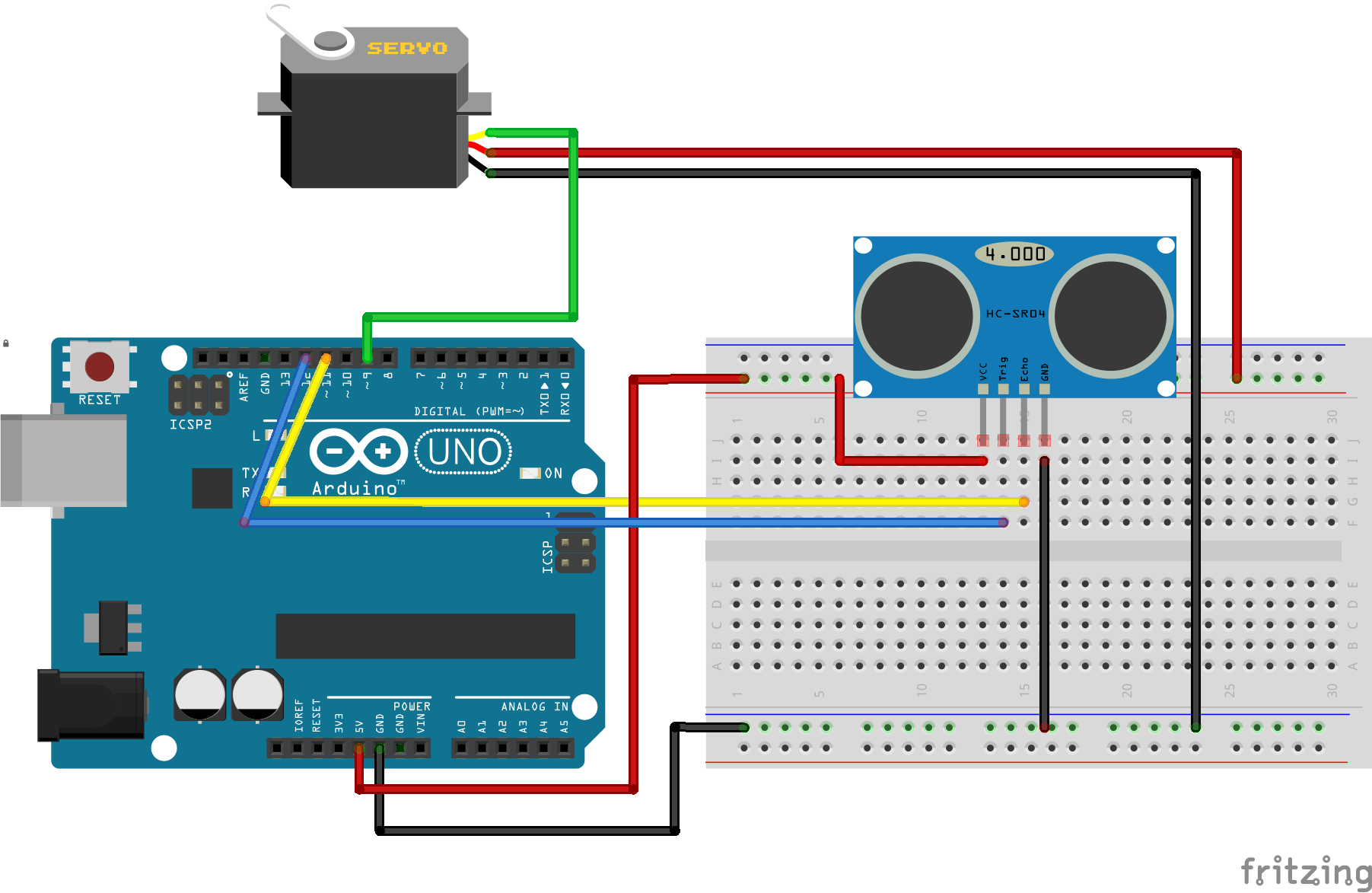
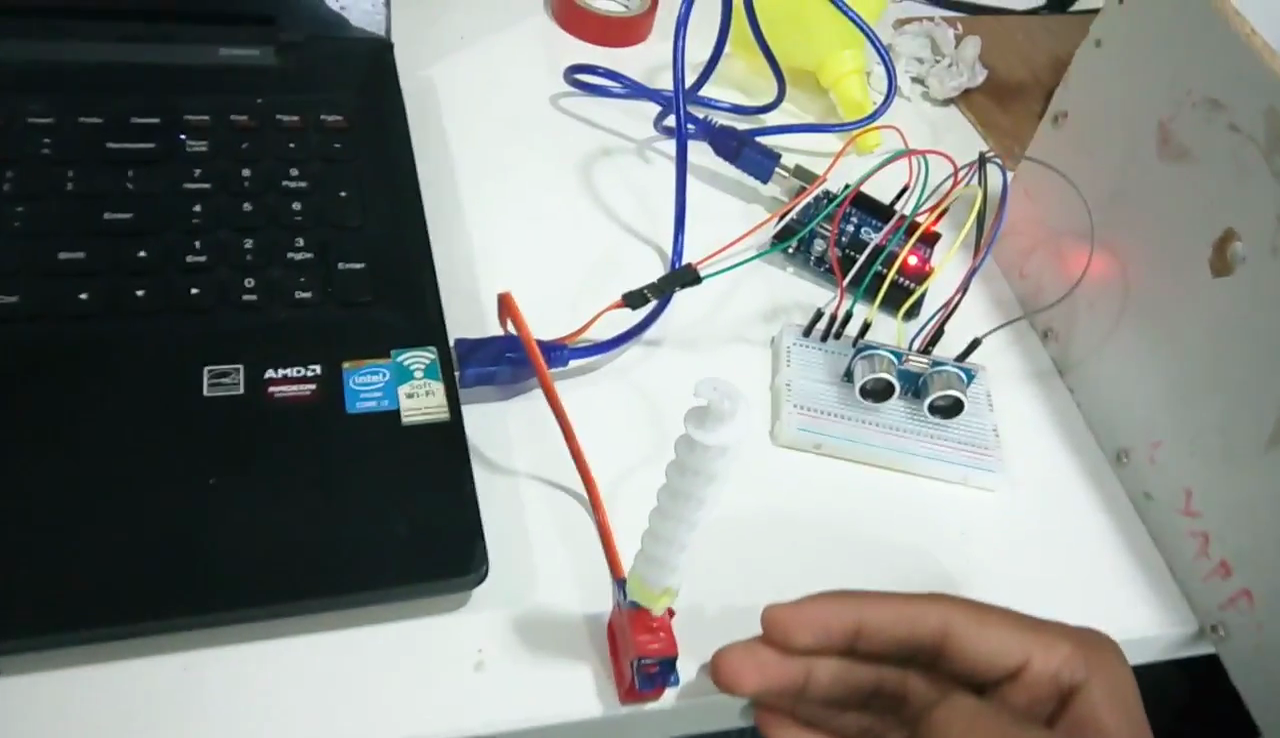
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Fig: Wireframe of LILI machine****

**STEP 6: CONNECTIONS**

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**STEP 7: code**

#include <Servo.h>

Servo myservo;// declare servo name type servo

const int trigpin = 12, echopin = 13 ;

int duration, distance;//declare variable for unltrasonic sensor

void setup() {

Serial.begin(9600);

pinMode(trigpin, OUTPUT);

pinMode(echopin, INPUT);

myservo.attach(9);// attach your servo

myservo.writeMicroseconds(1500);

// put your setup code here, to run once:

}

void loop() {

myservo.write(1500);// always set servo to 1500 to position stop position

//ultrasonic code

digitalWrite(trigpin,HIGH);

\_delay\_ms(3000);

digitalWrite(trigpin, LOW);

duration=pulseIn(echopin,HIGH);

distance=(duration/2)/29.1;

if(distance <=20)// if ultrasonic sensor detects an obstacle less than 20cm in 90 degree angle.

{

myservo.write(3500); //servo rotates at full speed to the right

delay(2500);

}

else

{

myservo.write(90);// else servo stays at 90 degree angle.

delay(10);

}

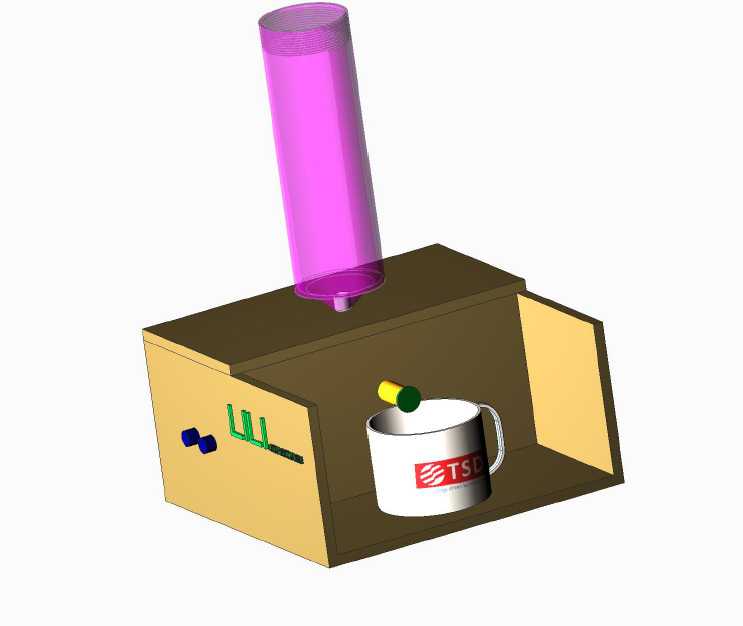
Serial.print("cm"); //print distance unit cm

Serial.println(distance);//distance

// put your main code here, to run repeatedly:

}

**STEP 8: Final Output**

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Output:

one time giving the signal you will get 8 grams of sugar

References:

1.www.instructables.com

2.ww.youtube.com

3.www.google.com