L&T EduTech

Microcontroller based Industrial Applications - Project

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Problem Statement: -

Develop a simple Arduino UNO-based Automatic Dust Bin system which can open the lid when it senses the object movement nearby.

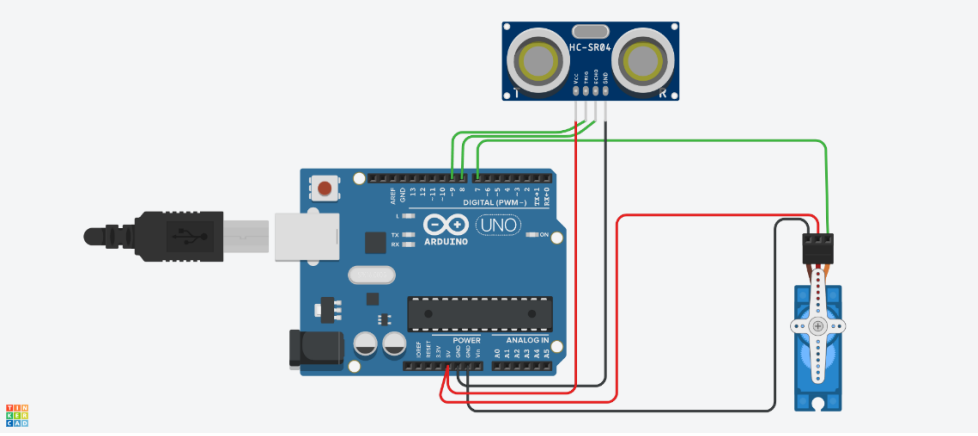
Scope of Solution: -

The proposed Arduino UNO-based Automatic Dust Bin system uses an ultrasonic sensor to detect nearby object movement. When motion is detected within a specific range, a servo motor automatically opens the dustbin lid. This hands-free system promotes hygiene, reduces contact with waste surfaces, and is ideal for homes or public places.

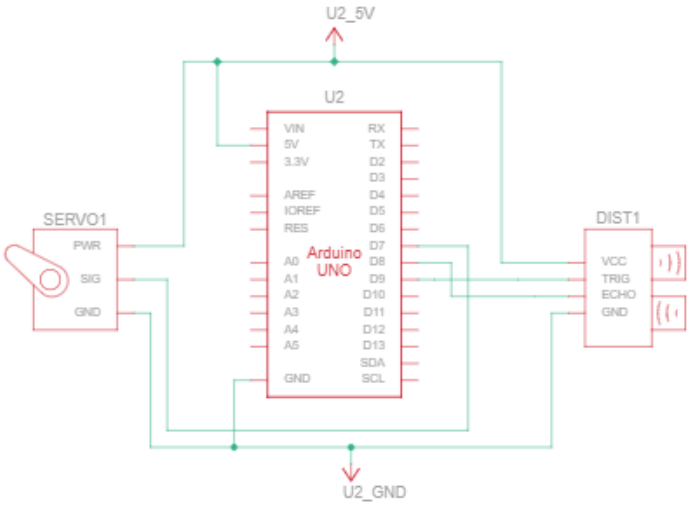
Required Components: -

- Arduino Uno
- Servo Motor
- Ultrasonic Sensor
- Jumper Wires
- Arduino IDE for writing the code
- TinkerCad for Simulation

Simulated Circuit: - (TinkerCad)



Gerber File: -



Code for the solution: -

```
#include <Servo.h>

#include <Wire.h>


Servo servo_1;

int trigPin = 9;

int echoPin = 8;


long duration;

int distance;
```

```
void setup(){
  servo_1.attach(7, 500, 2500);
  servo_1.write(90);  //initially keeping the bin lid closed
  delay(2000);

  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
}

void loop(){
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);
  distance= duration*0.034/2;

  Serial.print("Distance: ");
  Serial.println(distance);
```

```
  if ( distance <= 25   ){
    servo_1.write(0);  //when distance to bin is less than 25cm than bin opens lid
    delay(3000);
  }
  else{
      servo_1.write(90);  //when there is more than 25cm distance to the bin than bin lid closes
  }
}
```