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Project

**Motion Sensing Automatic Sanitizing
and Door Locking System**

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DESCRIPTION

As we are in the middle of a grave pandemic situation, our team members have come up with the idea of automatic sanitizing and temperature checking where no personnel will be involved.

There will be a proximity motion sensor on the door which will detect any motion, trying to enter and spray a necessary amount of sanitizer on him/her.

Now there will also be a non-touching type of temperature sensor that will detect the temperature of the specified person. If that person on the question has a higher temperature than 100°F, the door will stay locked and won't open, but if the temperature is less than 100°F, he/she can enter effortlessly.

COMPONENTS LIST

Sl.no	COMPONENTS	Quantity
1	Arduino uno R3	1
2	PIR Motion Sensor	1
3	Temperature Sensor(MLX90614)	1
4	LCD Display 16*2	1
5	Pump 12V	1
6	Relay 12V	1
7	Adapter 12V	1
8	Servo Motor	1
9	Nozzle	1
10	Pump Tube	1 Meter
11	Wire	As much Required

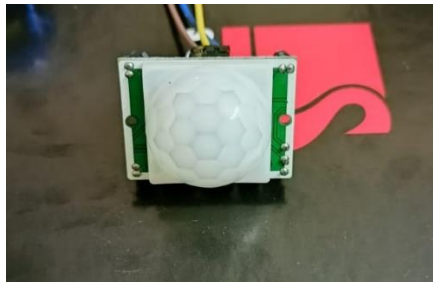
COMPONENTS DESCRIPTION

1. Arduino uno R3



The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.

2. PIR Motion Sensor



A motion sensor, or motion detector, is an electronic device that uses a sensor to detect nearby people or objects.

3. Temperature Sensor(MLX90614)



The MLX90614 is a Contactless Infrared (IR) Digital Temperature Sensor that can be used to measure the temperature of a particular object ranging from -70°C to 382.2°C

4. LCD Display 16*2



A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix.

5. Pump 12V



A pump is a device that moves fluids, or sometimes slurries, by mechanical action, typically converted from electrical energy into hydraulic energy.

6. Relay 12V



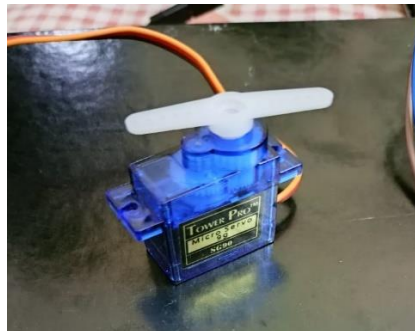
12V DC relay switches used for full voltage applications, as they allow a low current flow circuit to control a high current flow circuit

7. Adapter 12V



A power supply for electronic devices. Also called an "AC adapter" or "charger," power adapters plug into a wall outlet and convert AC to a single DC voltage

8. Servo Motor



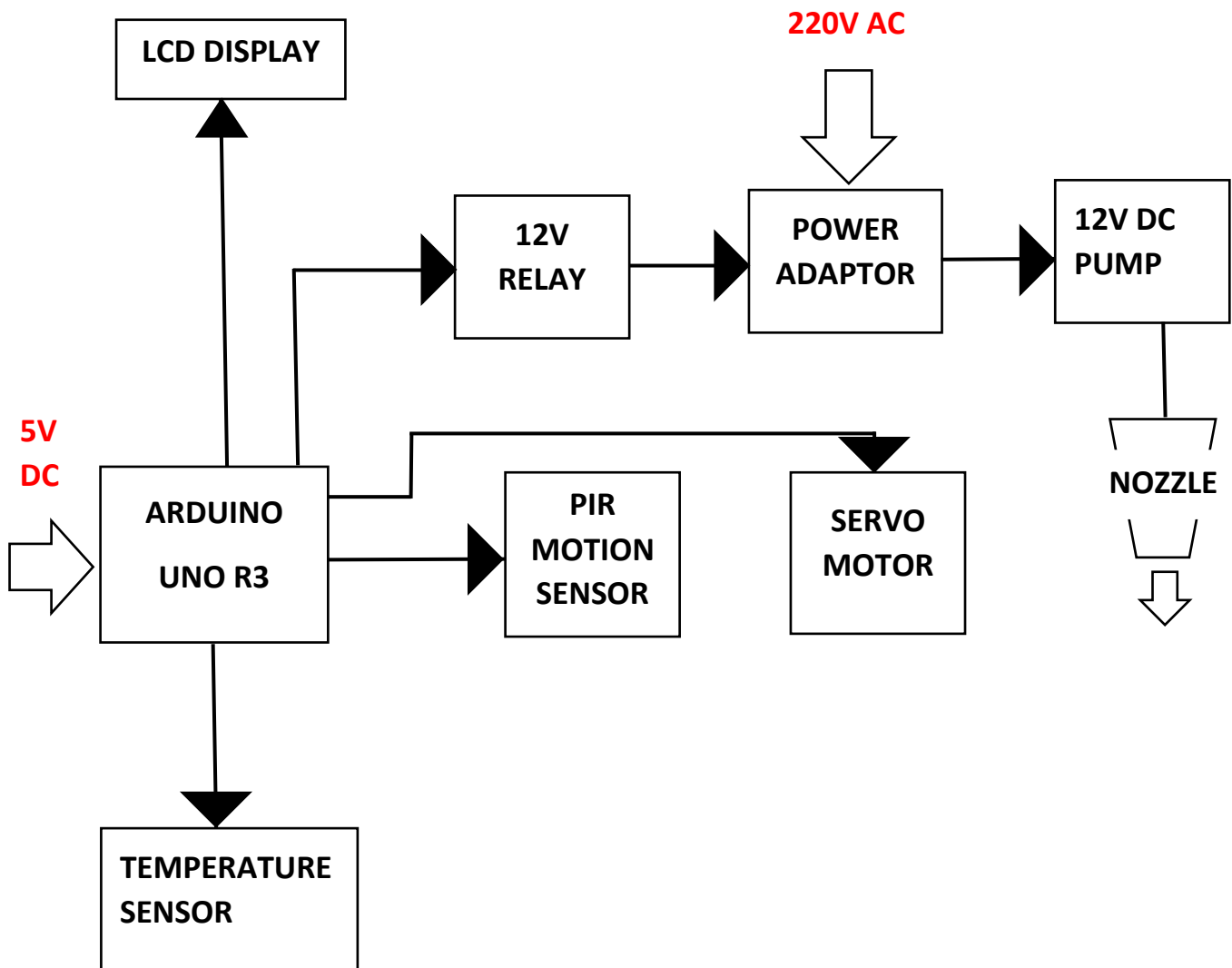
A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration.

9. Nozzle



A nozzle is often a pipe or tube of varying cross-sectional area, and it can be used to direct or modify the flow of a fluid

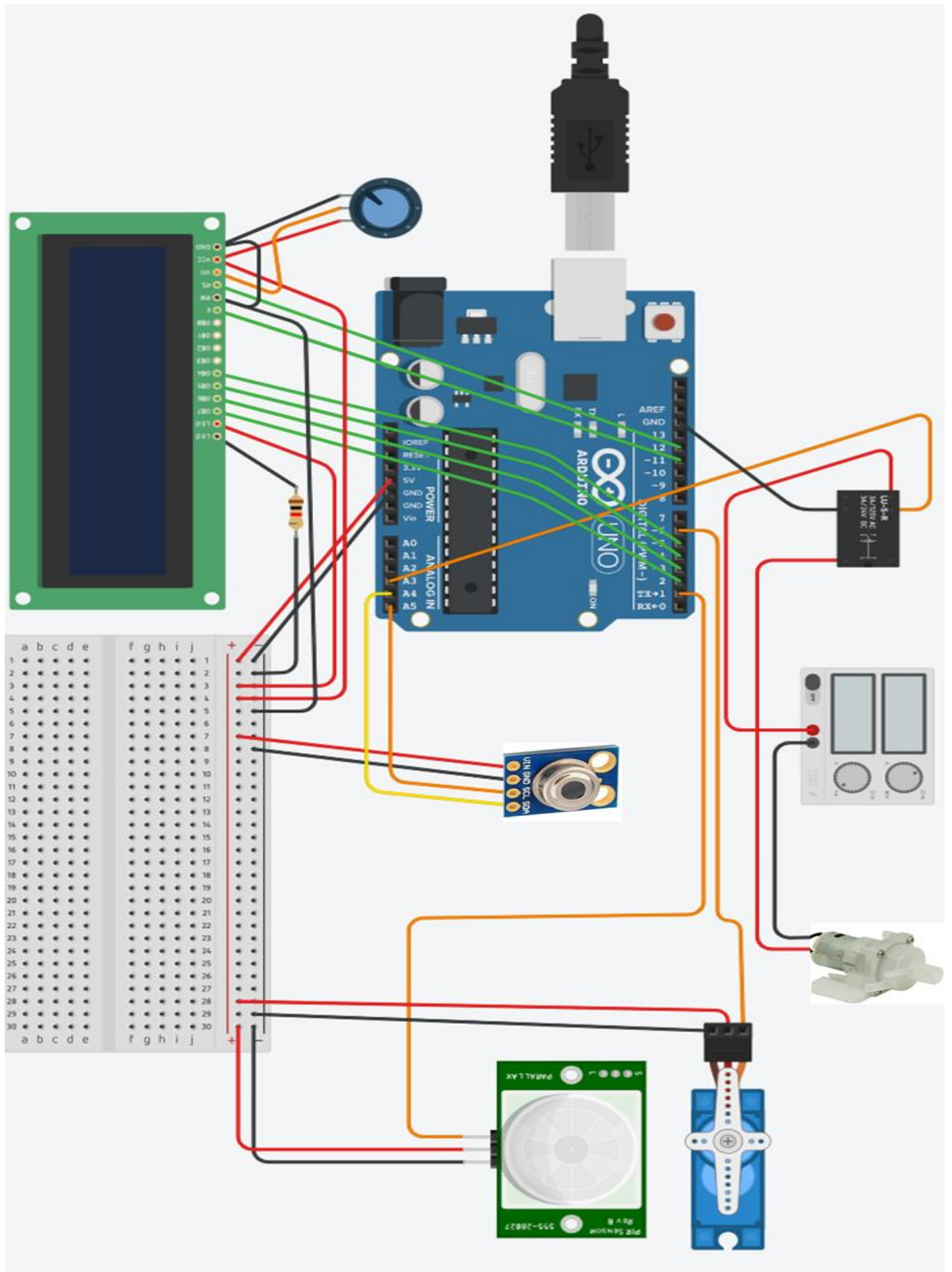
PROJECT BLOCK DIAGRAM



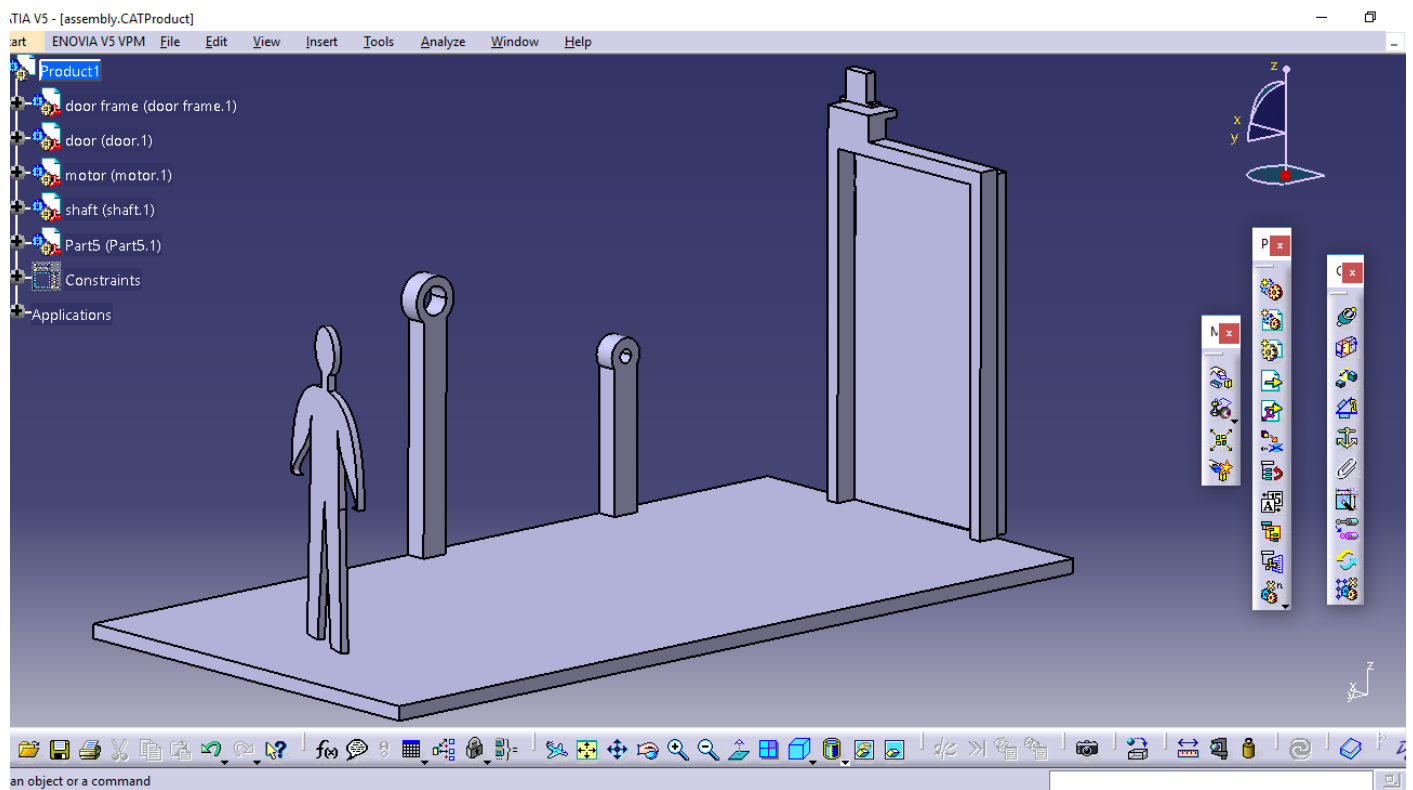
CIRCUIT DIAGRAM

The diagram illustrates a circuit for an Arduino Uno microcontroller. The components and their connections are as follows:

- Arduino Uno:** The central microcontroller board.
- USB Cable:** Connected to the USB Type-B port for programming and power.
- LDR Sensor:** Connected to digital pins 2 and 3.
- Potentiometer:** Connected to analog pins A0, A1, and A2.
- DHT11 Sensor:** Connected to digital pins 4 and 5.
- DC Motor:** Connected to a motor driver module.
- Servo Motor:** Connected to a servo controller module.
- Relay Module:** Connected to digital pins 6 and 7.



3D MODEL



WORKING PROCESS

- When PIR sensor detects any human motion within a range then Temperature sensor is activated, and it measures body temperature
- If the Temperature is in the range of 35.5°C to 37.5°C Pump and Servo motor is activated if not Pump and Servo motor are inactive
- Pump inlet is connected to sanitizer source and outlet is connected to nozzle for spraying sanitizer
- Servo motor is connected to door hinges when it is activated door opening and closing is done
- This is how Motion Sensing Automatic Sanitizing and Door Locking System works

ARDUINO CODING

```
#include <LiquidCrystal.h>

#include <Wire.h>

#include <Adafruit_MLX90614.h>

#include<Servo.h>


LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

float temp;

Adafruit_MLX90614 mlx = Adafruit_MLX90614();

int servo2 = 6;

int pir = 7;

int pir_value = 0;

int pir_state = LOW;

const int RELAY_PIN = A3;

float Temp;

Servo myServo1;

int pos = 155;

void setup()
{
  myServo1.attach(servo2);

  myServo1.write(pos);

  pinMode(pir, INPUT);

  pinMode(RELAY_PIN, OUTPUT);

  Serial.begin(9600);

  mlx.begin();

  lcd.begin(16, 2); // set up the LCD's number of columns and rows:
```

```
lcd.clear();

}

void loop()
{
    pir_value = LOW;
    Serial.print("Ambient = ");
    Serial.print(mlx.readAmbientTempC());
    Serial.print("*C\tObject = ");
    Serial.print(mlx.readObjectTempC());
    Serial.println();
    temp = mlx.readObjectTempC();
    pir_value = digitalRead(pir);
    Temp=mlx.readAmbientTempC();

    if (pir_value == HIGH)
    {
        Serial.println("Motion Detected");
        lcd.setCursor(0, 0);
        lcd.print("MOTION DETECTED");
        delay(2000);
        lcd.setCursor(0, 1);
        lcd.print("CHECK TEMP");
        delay(3000);
        lcd.clear();
        delay(1000);
        if (pir_state == LOW)
        {
```

```
    pir_state = HIGH;
}
}
else
{
    ServosClose();
    if (pir_state == HIGH)
    {
        Serial.println('Motion Stopped');
        lcd.clear();
        delay(1000);
        lcd.setCursor(0, 0);
        lcd.print("DOOR CLOSED");
        pir_state = LOW;
    }
}

if (temp > 32.5 && temp < 38 && temp!= Temp )
{
    if (pir_value == HIGH)
    {
        lcd.clear();
        delay(1000);
        lcd.setCursor(0, 0);
        lcd.print("YOUR TEMP");
        lcd.setCursor(0, 1);
        lcd.print("IS NORMAL");
        delay(1000);
    }
}
```

```
lcd.clear();  
delay(1000);  
lcd.setCursor(0, 0);  
lcd.print("SATINIZE");  
lcd.setCursor(0, 1);  
lcd.print("YOURSELF");  
delay(3000);  
digitalWrite(RELAY_PIN, HIGH);  
delay(5000);  
digitalWrite(RELAY_PIN, LOW);  
lcd.clear();  
delay(1000);  
lcd.setCursor(2, 0);  
lcd.print("WELCOME!!!");  
delay(1000);  
ServosOpen();  
lcd.clear();  
delay(4000);
```

```
}
```

```
}
```

```
}
```

```
void ServosOpen()
```

```
{
```

```
  for (pos = 155; pos >= 40;)
```

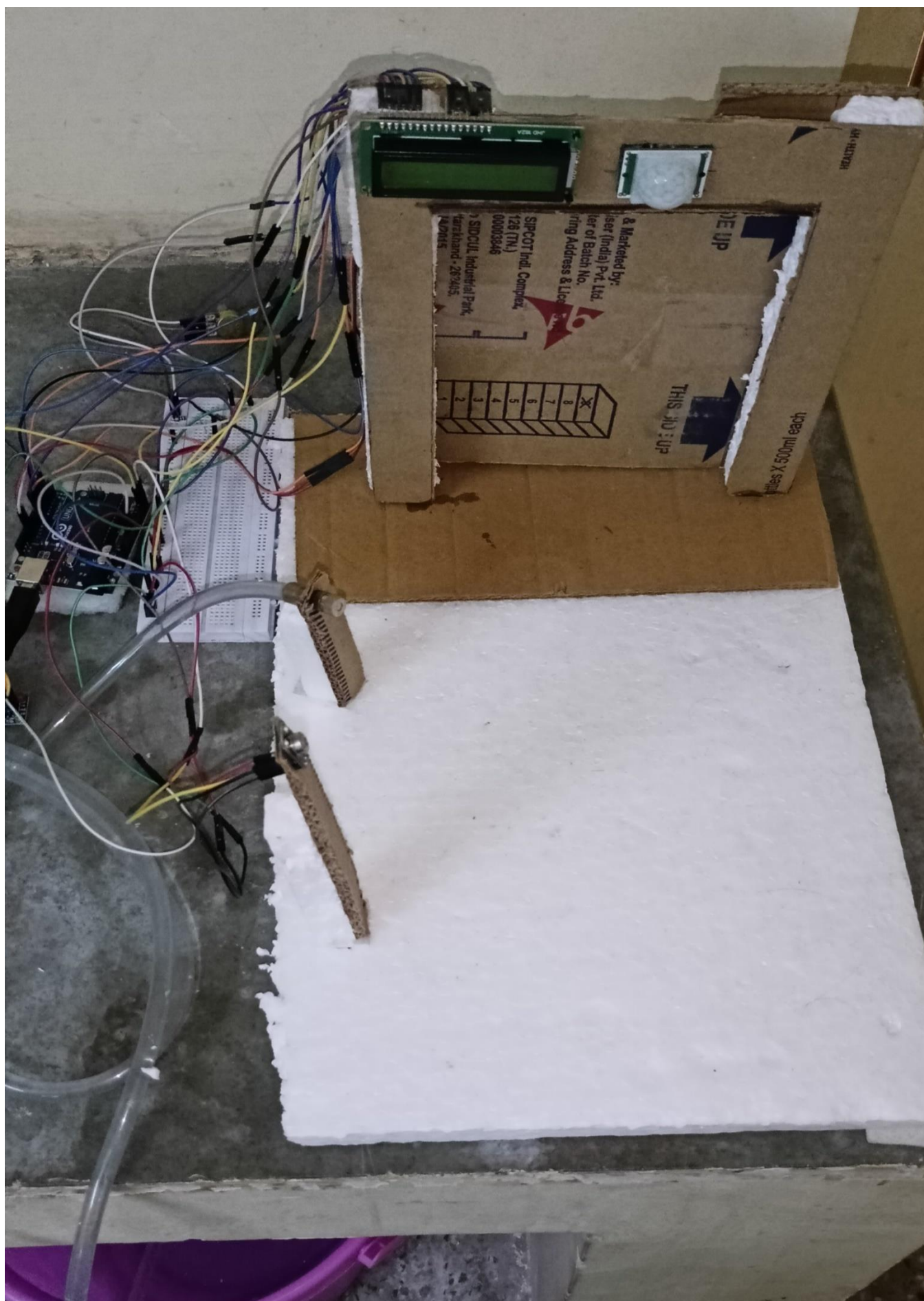
```
  {
```

```
    myServo1.write(pos);
```

```
    pos = pos - 5;
    delay(40);
}
}
void ServosClose()
{
    for (; pos <= 155; pos += 5)
    {
        myServo1.write(pos);
        delay(40);

    }
}
```


FINAL MODEL



COST ESTIMATION

SL NO	COMPONENT	Cost in Rs
1	Arduino Uno R3	500
2	IR Temperature sensor MLX9061	720
3	12V Pump	399
4	PIR Sensor	75
5	Servo Motor	120
6	12V DC Relay	250
7	12V Adaptor	100
8	Pump Nozzle	100
9	16*2 LCD Display	260
10	Pump Tube	50

Total Cost

2574 Rs

Thank You