**Automatic hand sanitizer dispenser and water dispenser**

**Introduction**

The COVID-19 pandemic has radically affected life for almost everyone around the globe, and makers are no exception. With everyone being more careful of their interactions with humans and objects, personal hygiene has taken serious precedence over all other factors in public space. A lot of public places have hand sanitizers for visitors, but they need to be manually pressed.

To avoid any contact at all, some no-touch hand sanitizer dispensers are commercially available, but they are expensive and most off-the-shelf commercial sanitizers cannot be automated. In this project, we create a contactless hand sanitizer dispenser that can be used for any press-to-release hand sanitizer available in the market. The project uses an Arduino Uno, an HCSR04 Ultrasonic sensor

COMPONENTS

**1.**[**Arduino Uno**](https://www.digikey.in/en/products/detail/arduino/A000066/1050-1024-ND/2784006)

**2.**[**Ultrasonic Sensor HC-SR04**](https://www.digikey.in/en/products/detail/adafruit-industries-llc/3942/1528-2711-ND/9658069)

**3.**[**Jumper Cables**](https://www.digikey.in/en/products/detail/sparkfun-electronics/PRT-11026/1568-1642-ND/5993855)

**4.**[**Servo Motor**](https://www.digikey.in/en/products/detail/sparkfun-electronics/ROB-14760/1568-1878-ND/9448178)

**5.**[**Breadboard**](https://www.digikey.in/en/products/detail/global-specialties/GS-830/BKGS-830-ND/5231309)

**6.**[**AA Battery Case**](https://www.digikey.in/en/products/detail/keystone-electronics/2478/36-2478-ND/303823)**&**[**4 AA Battery**](https://www.digikey.in/en/products/detail/energizer-battery-company/EN91/N107-ND/704822)

**Application**

* Counting people/people detection
* Presence detection
* Detecting breaks in threads or wires
* Box sorting
* Contouring or profiling
* Irregular parts detection
* Tank level detection

**Objective**

**During this activity ,you will help students to achieve following objectives**

**1.** Understanding the principle and operation of ultrasonic distance sensor

2. Design algorithm and flowchart to detect hand and press sanitizer nozzle

3. Programming ultrasonic distance sensor using Arduino uno

4. Interfacing ultrasonic distance sensor withArduino uno

**Programming steps**

1. Initialise sensors trigger pin and echo pin
2. Initialise servo motor pin as output
3. Include library of srvo motor.
4. Define trigger pin as output and echo pin as input
5. Send trigger signal
6. Read the status of echo signal pin
7. Check If the distance read by the sensor is less than 10 cm and more than the minimum 3 cm, then it is assumed that there is a hand under the sanitizer,start servomotor to 90 degree
8. If the distance read by the sensor is greater than 10 cm ,then there is no hand ,servo motor will get stop.

**Programming**

#**include** <Servo.h>

// HC-SR04 Echo Pin & Trigger Pin connect to the Arduino Uno Digital Pins

#**define** echo\_pin 2

#**define** trigger\_pin 3

// Servo PWM

#**define** servo\_pin 9

Servo servo\_motor;

**void** **setup**() {

pinMode(trigger\_pin, OUTPUT);

pinMode(echo\_pin, INPUT);

Serial.begin(9600);

servo\_motor.attach(servo\_pin);

}

**void** **loop**() {

digitalWrite(trigger\_pin, LOW);

delayMicroseconds(2);

digitalWrite(trigger\_pin, HIGH);

delayMicroseconds(10);

digitalWrite(trigger\_pin, LOW);

**long** duration = pulseIn(echo\_pin, HIGH);

**double** distance = duration \* 0.034 / 2;

Serial.print(distance);

// If the distance read by the sensor is less than 10 cm and more than the minimum 3 cm, then it is assumed that there is a hand under the sanitizer

**if** ((distance > 3) && (distance < 10)) {

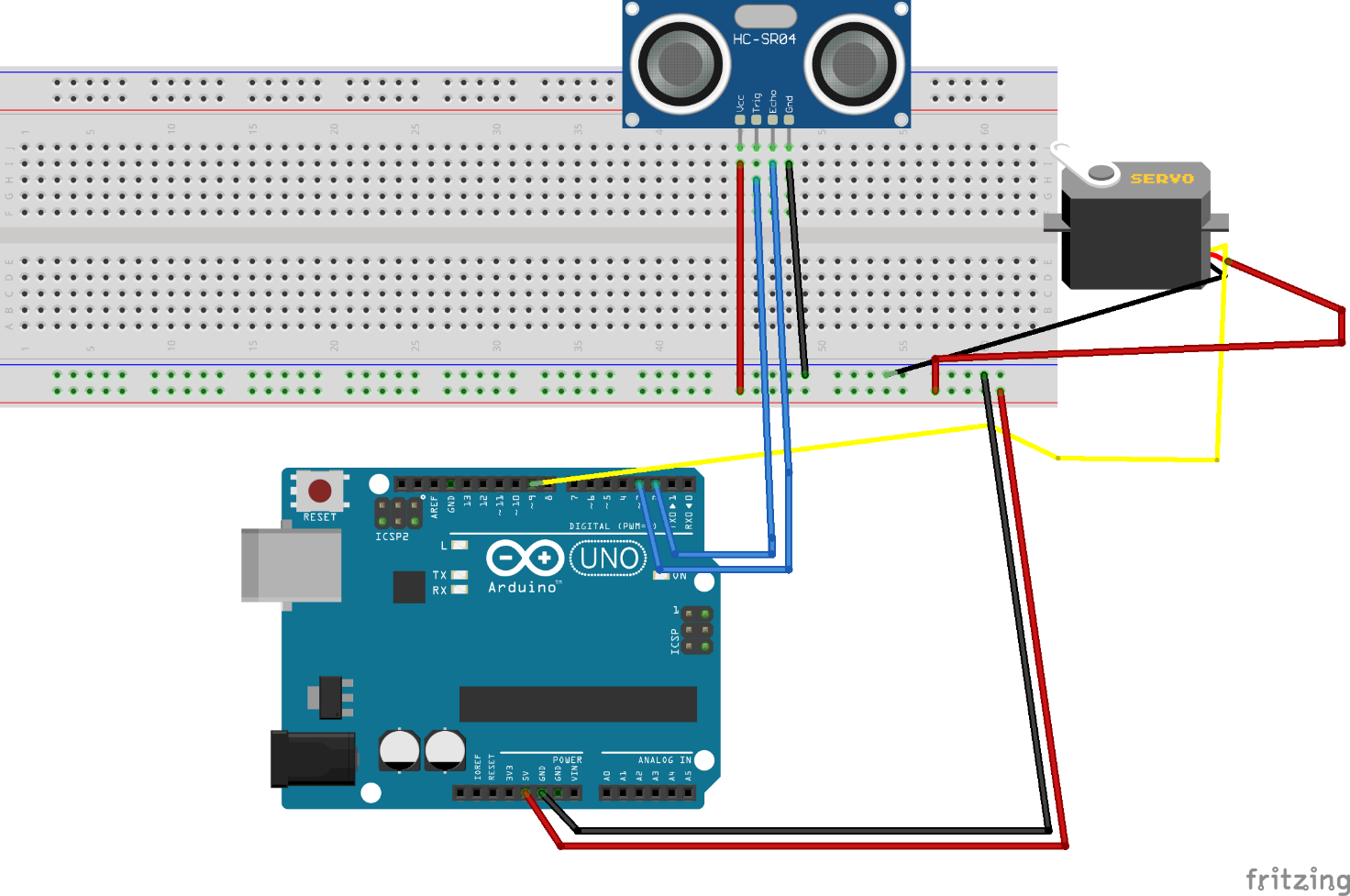
servo\_motor.write(90);

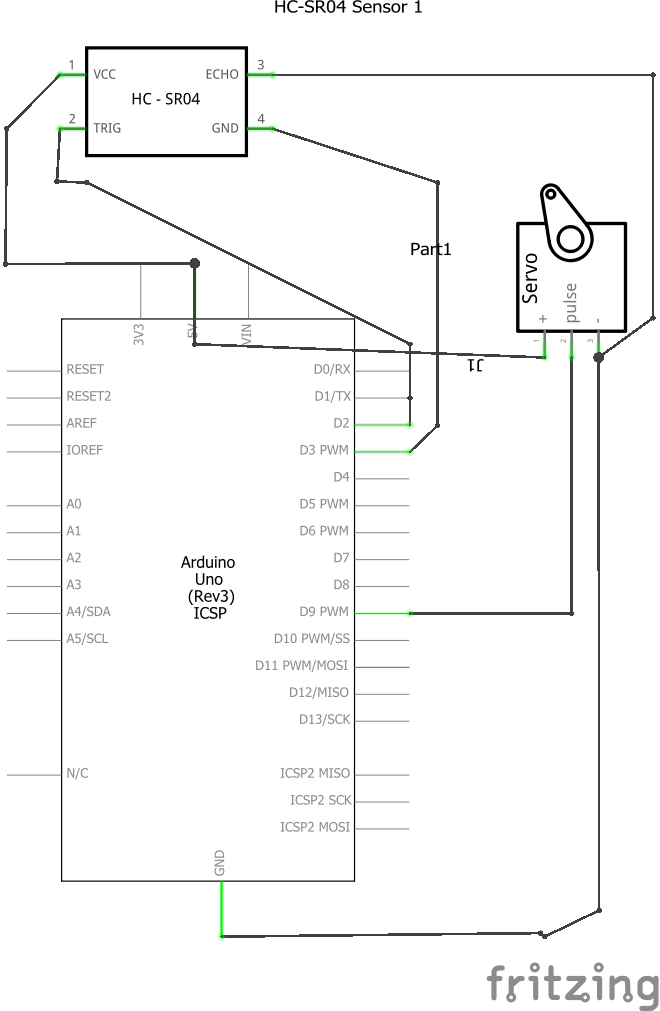
delay(100);

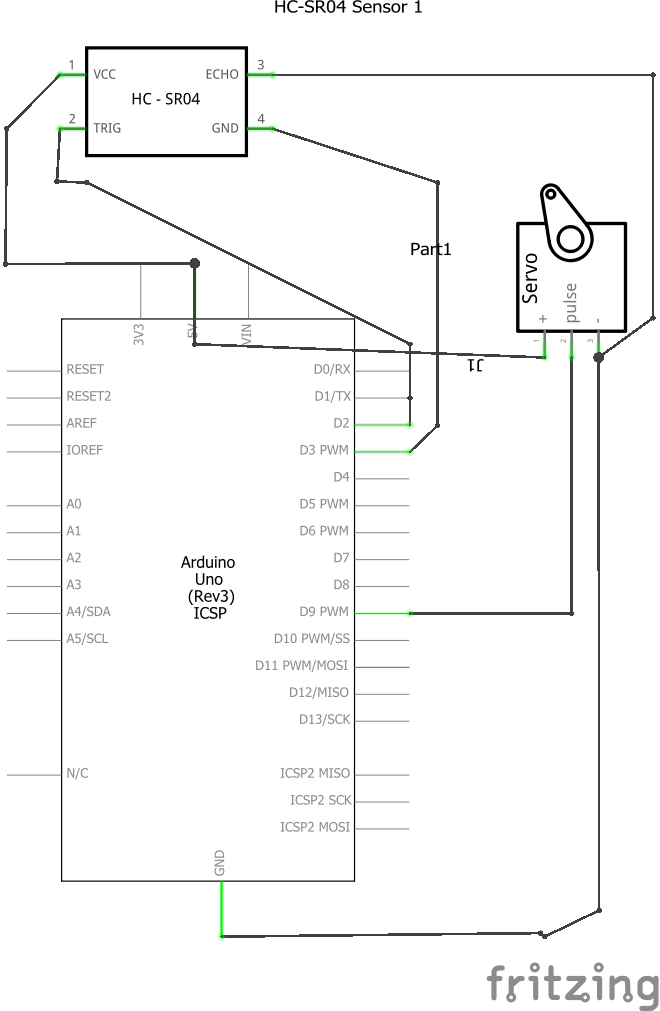
}

servo\_motor.write(0);

}

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