Part 1 - Procedure

1) Wiring up Arduino Uno, ultrasonic sensor and servo motor with jumper wire as shown.

Schematic

2) Print the Case (Part 1 & Part 2), base plate (Part 3) and upper arms (Part 4) for IoT suite with 3D Printer.

3) Assemble the ultrasonic sensor with the 3D printed base plate (Part 3).
   It can be done by hot glue or cable tie.
4) Assemble the ultrasonic sensor base plate (Part 3) to the upper arm (Part 4) with screw.

5) Assemble the servo motor and Arduino to the 3D printed case (Part 1 & 2). Mount the IoT Suite to the bump bottle.

In this model, we choose a bump bottle with 31mm diameter. The ring diameter can be adjusted in 3D model according to different brands of sanitizer.

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**Part 2 - Source Code for Arduino IDE**

```cpp
#include <Servo.h>

//defines servo object
Servo myservo;

// defines pins numbers
const int trigPin = 5;
const int echoPin = 6;

// defines variables
int threshold = 20; //define threshold for the sensing distance
int distance;

void setup() {
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input
  Serial.begin(9600); // Starts the serial communication
}
myservo.attach(9, 500, 2400); // Refine the pulse width for MG996R
myservo.write(90); // Center to 90 degree first
delay(3000);
}

void loop() {
    long duration;
    distance = 0;
    // Clears the trigPin
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    // Sets the trigPin on HIGH state for 10 micro seconds
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    duration = pulseIn(echoPin, HIGH); // Reads the echoPin, returns the sound wave travel
time in microseconds
    distance = duration * 0.034 / 2; // Calculating the distance
    if (distance < threshold) pulling_servo(); //Press the sanitizer if their are object within the
threshold distance
    else release_servo(); //Release servo if the distance back to normal
}

void pulling_servo() {
    Serial.println(distance); // Prints the distance on the Serial Monitor when it is lower than
the threshold
    myservo.write(0);
    delay(2000);
}

void release_servo() {
    Serial.println(distance); // Prints the distance on the Serial Monitor when it is lower than
the threshold
    myservo.write(90);
    delay(1000);
}

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Part 3 - Reference
https://medium.com/asbavensky/d-i-y-automatic-alcohol-dispenser-a82bc3828de6
https://create.arduino.cc/projecthub/FANUEL_CONRAD/automatic-soap-dispenser-75abd6
https://www.viralsciencecreativity.com/post/arduino-automatic-soap-dispenser

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