## Automatic soap dispenser

## Automatic soap dispenser is a device which dispense a controlled amount of [soap](https://en.wikipedia.org/wiki/Soap) solution (or a similar liquid such as a [hand sanitizer](https://en.wikipedia.org/wiki/Hand_sanitizer)). They are often used in conjunction with [automatic faucets](https://en.wikipedia.org/wiki/Automatic_faucet) in public restrooms. They function to conserve the amount of soap used and stem [infectious disease](https://en.wikipedia.org/wiki/Infectious_disease) transmission.

## Mechanisms[

When washing hands, the user’s hands are placed under the nozzle and before the sensor. The activated sensor will further activate a [pump](https://en.wikipedia.org/wiki/Pump) that dispenses a premeasured amount of soap from the nozzle.

### Passive infrared sensor

[Infrared](https://en.wikipedia.org/wiki/Infrared) sensors detect infrared energy that is emitted by one’s body heat. When hands are placed in the proximity of the sensor, the infrared energy quickly fluctuates. This fluctuation triggers the pump to activate and dispense the designated amount of soap.

**Hand wash** also known as **hand hygiene**, is the act of cleaning hands for the purpose of removing soil, dirt, grease, and [microorganisms](https://en.wikipedia.org/wiki/Microorganism).

**Arduino Uno** is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button.

Code

//defines pin number

const int servo = 9;

const int trigpin = 10;

const int echopin = 11;

//defines variables

long duration;

int distance;

#include<servo.h>

Servo myservo; //creates servo object to control servo

//twelve servo objects can be created on most boards

int pos =0 ; //variable to store the servo position

void setup( )

{ pinMode ( trigPin , OUTPUT );//sets the trigpin as output

pinMode ( echoPin , INPUT );//sets the echopin as input

myservo.attach( 9 );//attaches the servo on pin 9 to servo object

myservo.write( 0 );

Serial.begin( 9600 //starts the serial communication

}

void loop( )

{ digitalWrite( trigPin ,LOW );

delayMicroseconds( 2 ); //sets the trigpin on low for 2 microseconds

digitalWrite ( trigPin , HIGH );

delayMicroseconds( 10 ); //sets the trigpin on high state for 10 microseconds

digitaWrite( trigPin , LOW );

duration = pulseIn(echoPin,HIGH); //reads the echopin and returns the sound wave travel time in microseconds

distance = duration \* 0.034/2 ; // calculates the distance

Serial.print( “Distance : “);

Serial.print( distance ); //print the distance on serial monitor

//servo

If ( distance < 10 ) // checks the distance id less than 10 or not

{

myservo.write (45 );

delay (100 );

myservo.write (90 );

delay (100 );

myservo.write (135 );

delay (100 );

myservo.write (180 ); //adjust how far you want servo to go

delay (1000);

myservo.write (0 ); //tells servo to go to position in variable ‘pos’

delay (3000 );

}

}