

# Clean Paws Timer™



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### Technical Description:

As CDC recommends, wash frequently for at least 25 seconds. This timer can help to ensure users washing their hands for at least 25 seconds. When the user waves his hand near an ultrasonic distant sensor, which is included in the device, the device will begin a count down of approximately 25 seconds. While counting, a green LED will be flashing once every second until 25 seconds is up. When a 25 second countdown has completed, a buzzer will play a tone to inform the user that 25 seconds is up, and the user may rinse his hands. If the timer is not activated, a red LED will remain lit to indicate that the timer is ON and is ready to begin countdown when activated. If an object is placed near the ultrasonic sensor and not removed later, the timer will light the green LED and flash the red LED to indicate there is an error to the sensor.

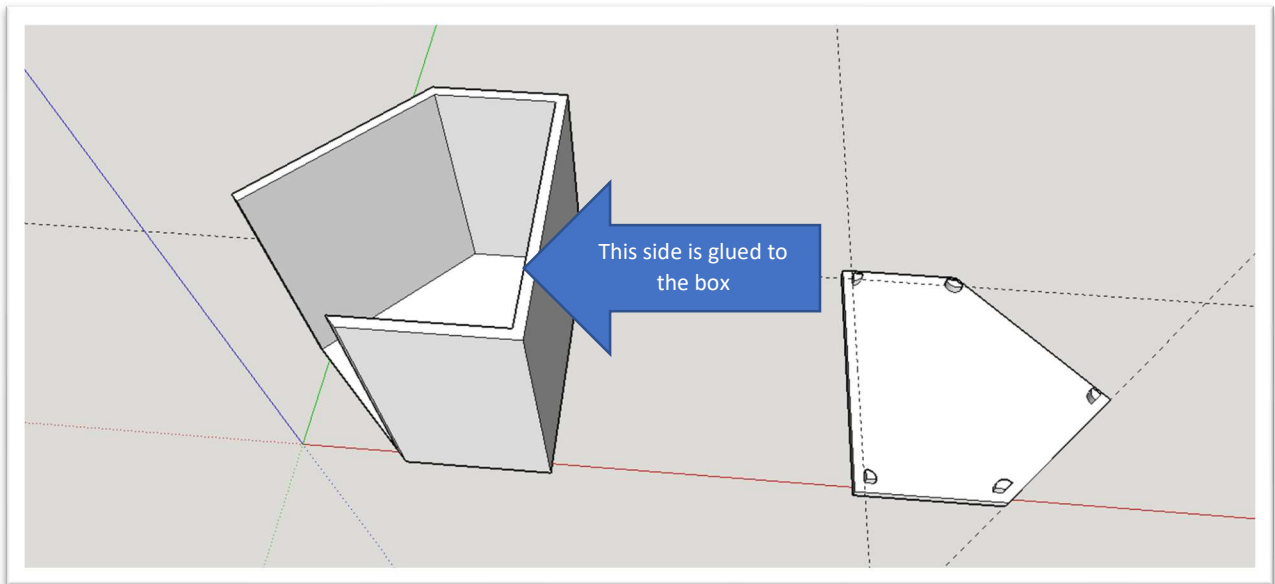
### Applications:

This device can be used particularly for industrial purposes. Places for this device can include restaurants, hospitals, child day care centers, senior residence homes, any facilities that provide public services.

Images:



3D printed part:

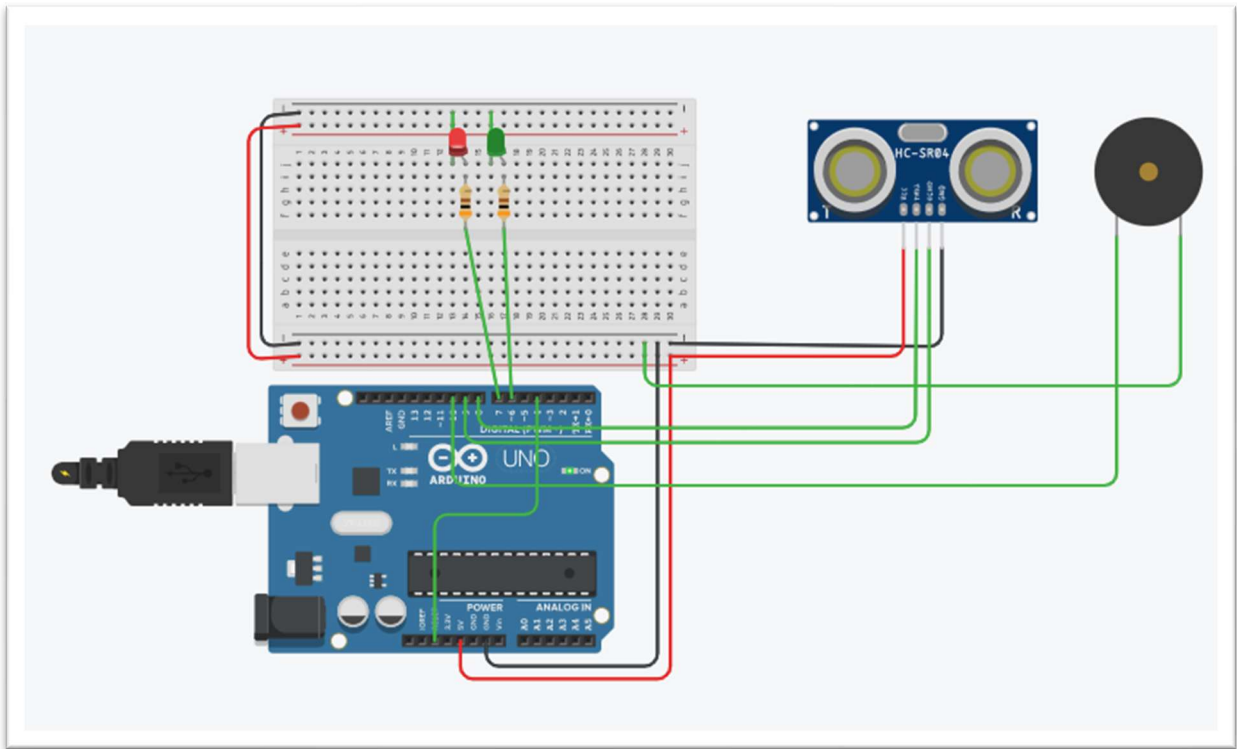


Project Timer Record			
Tasks	Time spent (minutes)	Task Leader	Participants
Conceptualizing the Product	15	Brett Towery	Jakob Okon, William Wright
Arduino Programming	180	William	Brett, Jakob
Designing Printed Parts and gathering supplies	30	Brett, Jakob, William	
Assembling the device	120	Brett	Jakob, William
Creating Product's Webpage and Media	60	Jakob	Brett, William

### Supplies and Cost(\$)

Item Name	Quantities	Cost in \$	Source
Arduino Uno Kit*	1	35.00	WCU College of Engineering and Tech.
3D printed part	1	0.70	WCU College of Engineering and Tech.
Plastic Container	1	1.70	Home
Paint		6.00	Home

\*Not all supplies are used for this project



## Arduino Program:

/\*Hand Washing Timer

\* this is a program that will enable an Arduino to do count downs of 20 seconds (as CDC recommended the time needed to wash hands).

\* To trigger the timer, an ultrasonic distant sensor will be used. When user swipes his or her hand near the sensor, the timer will begin countdown.

\* while counting, the timer will also flash a green led. When 20 seconds is up, the device will play a tone which informs the user that 20 seconds has passed.

\*

\* William Wright 10/5/2020

\* \*/

```
int trigpin = 8; //the pin which will provide power to the sonic energy producer
int echopin = 9; //the pin which will receive the ultrasonic sound
int t = 0; //int t for the time counting process

int indicateled = 6; //the green led will be powered by this pin
int errorled = 7; //the red led will be powered by this pin

float duration, d; //two variables to carry the duration value and distance value

const int buzzer = 10;// the buzzer will be powered by this pin

void setup() {
    //digitalWrite(Reset, HIGH);
    //delay(100);
    //pinMode(Reset, OUTPUT);
    //Serial.begin(9600);
    //Serial.println("How to Reset Arduino Programmatically");
    //Serial.println("www.TheEngineeringProjects.com");
    //delay(100);

    pinMode( errorled, OUTPUT); //red led pin set to output
    pinMode( indicateled, OUTPUT); //green led pin set to output
```

```
pinMode( trigpin, OUTPUT ); //pin 9 is designated as a power output for the distance sensor
pinMode( echopin, INPUT ); //pin 10 is designated as the receiver pin of the sound signal
```

```
}
```

```
void dfunction(){ //name a function that will calculate distant with the distant sensor
    digitalWrite(trigpin, LOW); //reset the ultrasonic sound producer to OFF
    delayMicroseconds(2); //wait for 2 microseconds
    digitalWrite(trigpin, HIGH); //create a steady high frequency sound
    delayMicroseconds(10); //the high frequency sound remains for 10 microseconds
    digitalWrite(trigpin, LOW); //turn off the ultrasonic sound producer

    duration = pulseIn(echopin, HIGH); //assign float duration the value the sound receiver
    produces in the unit of time

    d = (duration*.0342)/2; //converting the time duration of sound to distance with a
    mathematical relationship
}
```

```
#define NOTE_G4 400 //notes the buzzer will play after 20 seconds countdown.
```

```
#define NOTE_F4 352
```

```
#define NOTE_C4 260
```

```
#define NOTE_E4 332
```

```
void loop() {
    dfunction(); //using dfunction() to measure distance.
```



```

if( d < 5 && d > 0){      //if measured distance is less than certain cm, the following happens
    digitalWrite( errorled, LOW); //turn off red LED

    for (t = 25; t > 0; t--){ //counting code from 25 seconds to 0 seconds.

        digitalWrite(indicateled, HIGH); //turn on green LED
        delay(500);
        digitalWrite(indicateled, LOW); //turn off green LED
        delay(500);

    } //now 25 seconds has passed, the following will happen

    digitalWrite(indicateled, HIGH); //the green led will remain on to indicate that 25 seconds has
passed to the user

    tone(buzzer, 392); // playing the 1st note of a tone
    delay(600);
    tone(buzzer, 349); //playing the 2nd note
    delay(400);
    tone(buzzer, 261); //playing the 3rd note
    delay(400);
    tone(buzzer, 329); //playing the final note
    delay(600);
    noTone(buzzer); //turn off buzzer
    digitalWrite(indicateled, LOW); //turn off the green led

    while(d < 5){ //from here in the {} bracket, the program will recalculate distance
continually until d is

```

```
digitalWrite(indicateled, HIGH); //greater than certain amount(preventing the timer to  
recount before the hand is pulled away and placed back near the sensor)
```

```
digitalWrite(errorled, HIGH); //the following will cause the red led to flash which inform  
the users to remove the object near the sensor.
```

```
delay(250);
```

```
digitalWrite(errorled, LOW);
```

```
dfunction();
```

```
delay(100);
```

```
}
```

```
}
```

```
else{
```

```
digitalWrite(indicateled, LOW);//the following will light the red led which informs the user that the  
timer is ready to start count down.
```

```
digitalWrite(errorled, HIGH);
```

```
delay(100);
```

```
}
```

```
}
```