SMART PUBLIC RESTROOM

IOT_PHASE 4 PROJECT

Context:

- Introduction
- Software required
- Components required
- Program
- Output
- Advantages

INTRODUCTION

- Smart washrooms are among recent IoT solutions that are very soon to be implemented here and there. Such new generation restrooms are expected to significantly improve customer experience and employee well-being while also lower costs allocated to maintain equipment.
- Here in addition with development part 2 we are going to add automatic flush to maintain the hygienic surroundings with the help of temperature sensor.

Software required

- Wokwi software

Components

- Ardunio uno
- Breadboard
- LED
- Push button
- DS18B20
- Resistor
- Servo

Program:Occupancy indicater

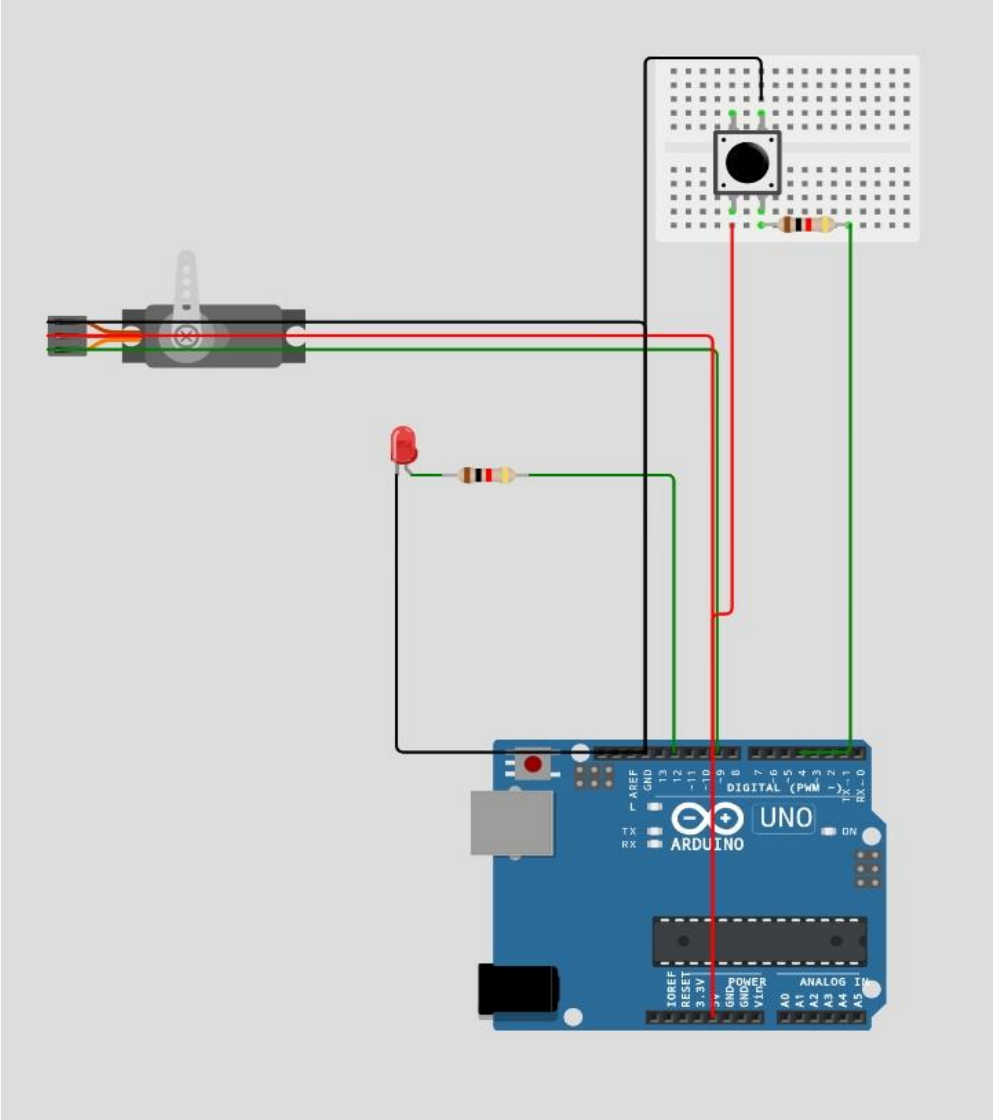
```
#include <Servo.h>

const int buttonPin = 4;
const int ledPin = 12;
const int servoPin = 9;  // Digital pin for the servo

int buttonState = 1;

Servo doorServo;

void setup() {
  pinMode(ledPin, OUTPUT);
  pinMode(buttonPin, INPUT);
doorServo.attach(servoPin);//Attaching the servo to the pin
}
void loop() {
  buttonState = digitalRead(buttonPin);

    if (buttonState == HIGH) {
   // Restroom is occupied
   digitalWrite(ledPin, HIGH);
```

```
    // Open the door (rotate the servo)
    doorServo.write(90);  // Angle to open the door

  } else {
    // Restroom is vacant
    digitalWrite(ledPin, LOW);

        // Close the door (return the servo to its initial position)
    doorServo.write(0);  // Angle to close the door
  }
}
```

Output Link:

https://wokwi.com/projects/378898578284772353

Output:

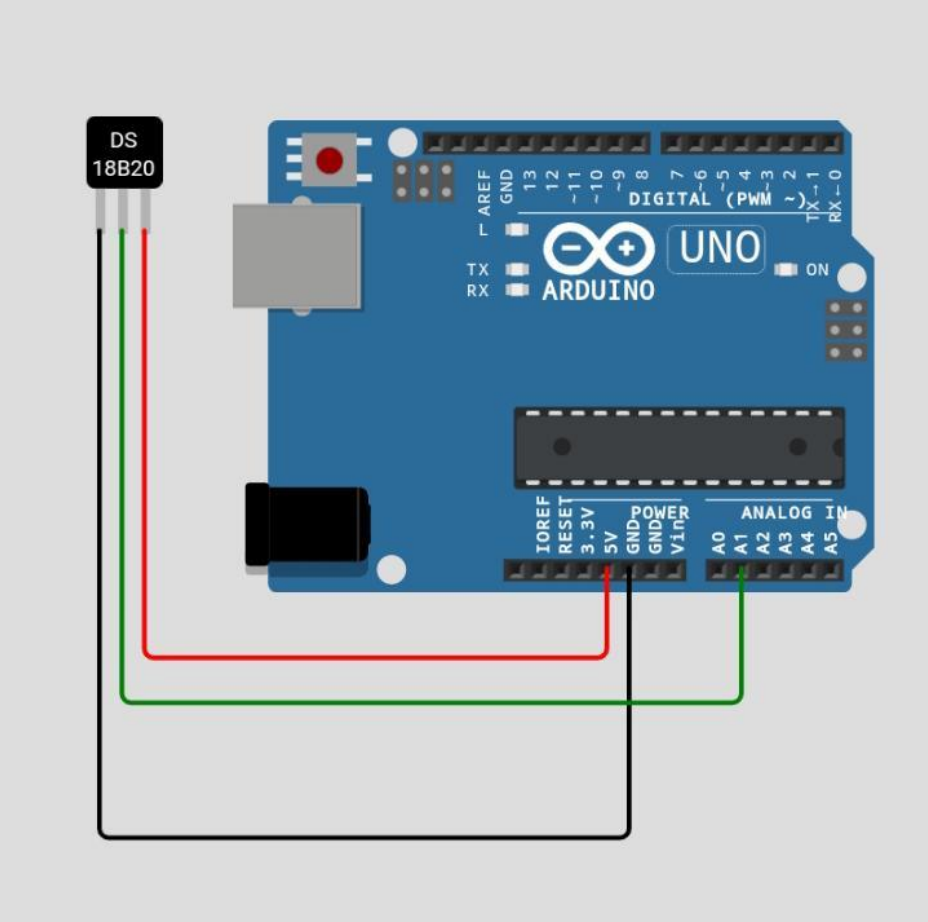


Program:Temperature sensor

```
const int DS18B20_pin = A1; /* DS18B20 O/P pin */

    void setup() {
  Serial.begin(9600);
}

    void loop() {
  int temp_adc_val;
  float temp_val;
  temp_adc_val = analogRead(DS18B20_pin); /* Read Temperature */
  temp_val = (temp_adc_val * 4.88); /* Convert adc value to equivalent voltage */
  temp_val = (temp_val/10); /* DS18B20 gives output of 10mv/°C */
  Serial.print("Temperature = ");
  Serial.print(temp_val);
  Serial.print(" Degree Celsius\n");
  delay(1000);
}
```

Output link: https://wokwi.com/projects/379628162270992385

Output:



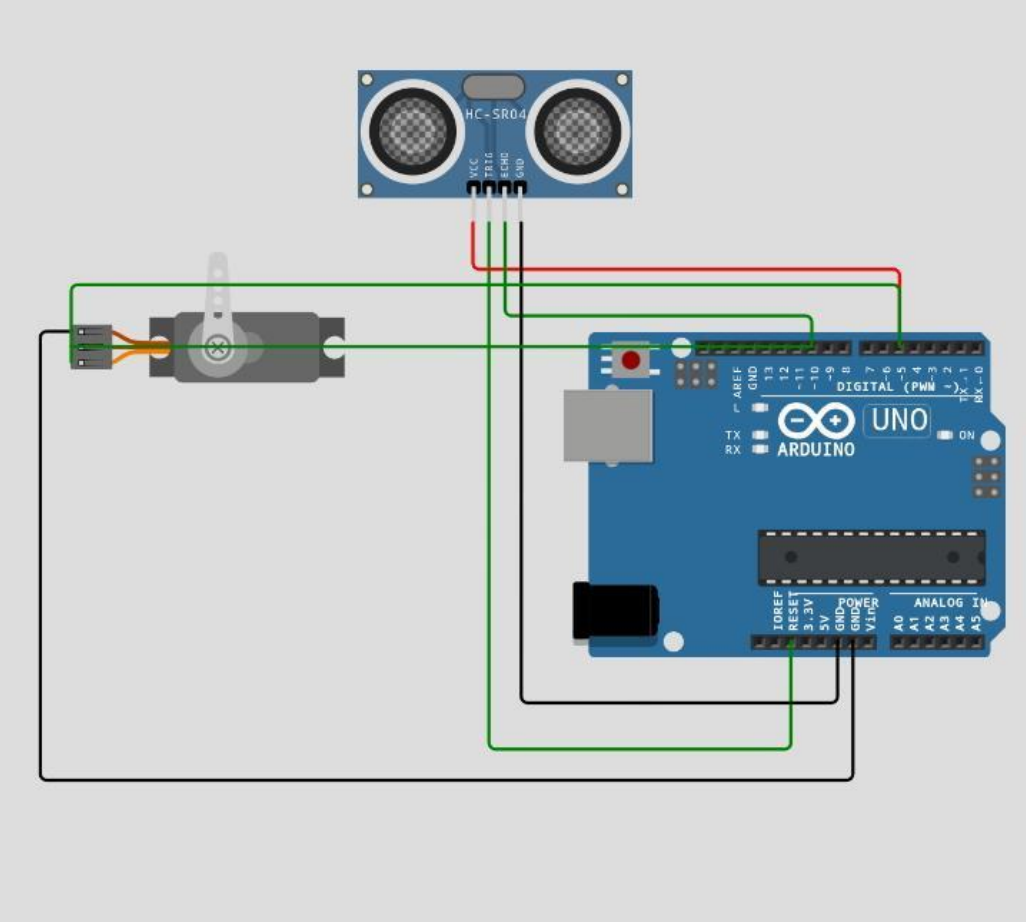
Program:Automatic Flush

```
#include <Servo.h>
 Servo servo1;

      int sensor=0;
int sensorPin=5; //distance sensor on analog pin 5

      int PreparingToFlush=0;

      void setup() {
  Serial.begin(9600);
  servo1.attach(10); //servo data line on pin 10
  servo1.write(3);
}


      void loop() {
sensor=analogRead(sensorPin);
if (sensor > 100){  //if distance sensor detects someone
  delay(2000);   // wait
  sensor=analogRead(sensorPin);
```

```
  if (sensor > 100){ // check again to make sure someone is actually there
  PreparingToFlush=1;
  }
}

      if (PreparingToFlush==1){ //if a person has been detected
  if (sensor < 100){ // if the person has now left

  servo1.write(175); //FLUSH
  delay(5000);
  servo1.write(3);
  delay(1000);

  PreparingToFlush=0;  //reset the trigger
}
}

  delay(10);
}
```

Output link:https://wokwi.com/projects/379630700498494465

Output:


HC-SR04
VCC
TRIG
ECHO
GND
DIGITAL (PWM ~)
UNO
ARDUINO
TX
RX
ON
POWER
ANALOG IN

Advantages:

- Improvement of hand hygiene: each is encouraged to wash hands when leaving the washroom.
- Hand disinfection by sanitizer usage in hospitals to track hand hygiene compliance to help prevent hospital-acquired infections.
- Anonymity: separate individuals are not tracked, the system only counts the number of people entering and washing hands.
- Availability of statistics on the number of employees who skip hand washing when leaving a restroom, which is crucial for any business, healthcare organization, and food industry.

THANK YOU

Presented by:

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