

## Phase 4 development

### SMART PUBLIC RESTROOM

#### INNOVATION:

- In this phase you need to put your design into innovation to solve the problem.
- Explain in detail the complete steps that will be taken by you to put your design that you thought of in previous phase into transformation.
- Create a document around it and share the same for assessment.

In the phase 3, we initiated to develop our idea of the problem statement and it ended up with the technologies to monitor the occupancy and automatic door opening system using IOT devices.

#### Technologies Used:

- 1.IOT (internet of things)
2. Smart Locks: Access control systems with QR codes or RFID cards can be used to manage entry and exit to maintain safety and security.
3. Occupancy Sensors: These sensors can monitor the restroom's occupancy and provide real-time data to help users find available facilities.

#### Implementation in IoT devices:

In wokwi platform, we have to develop the code for simulating

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

```
const int buttonPin = 7;
```

```
const int ledPin = 2;
```

```
const int servoPin = 9; // Digital pin for the servo
```

```
int buttonState = 0;
```

```
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
```

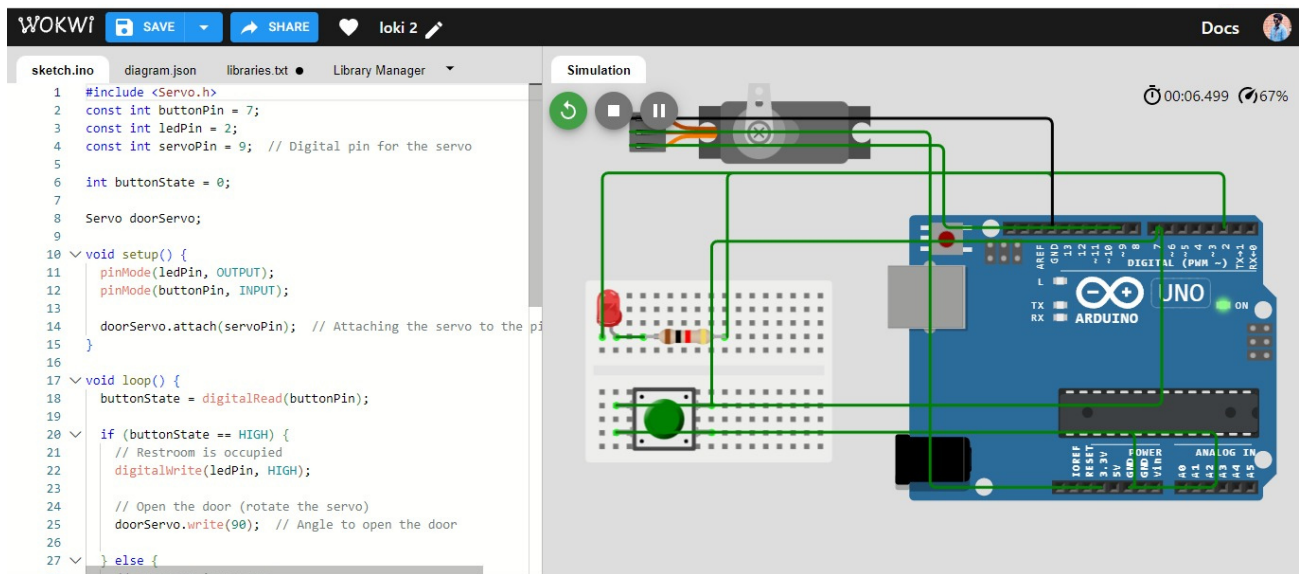
```
    digitalWrite(ledPin, LOW);
```

```
    // Close the door (return the servo to its initial position)
```

```
    doorServo.write(0); // Angle to close the door
```

```
  }
```

```
}
```



## Conclusion:

In conclusion, smart public restrooms driven by IoT have the potential to revolutionize public sanitation, making them more convenient, sustainable, and user-friendly. This innovation aligns with the broader trend of smart cities and contributes to a cleaner, more efficient urban environment. However, challenges related to privacy, security, and maintenance must be carefully addressed for successful implementation.