APPLICATION OF IOT (AIOT HOME)
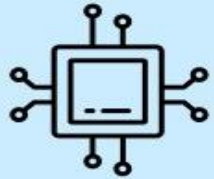
INTERNET OF THINGS(IOT)

The Internet Of Things (IoT) – or Internet of Things – represents the network of physical objects "Things" that are integrated with sensors, software and other technologies for the purpose of exchanging data with other devices and systems on the Internet.

How does the Internet of Things work?

Things   Insights   Actions

IOT ARCHITECTURE

Sensors and Actuators

→

IoT Gateway and Data Acquisition Systems

→

Edge IT: fog computing
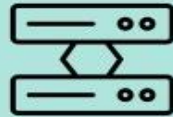
→

The cloud: in-depth analysis

Sensors are physical devices that collect information from the real-world environment, such as temperature, air quality, people flow, etc.

Actuators are devices that can take electrical input and turn it into physical action.

1

A **data acquisition system (DAS)** collects raw data from sensors, aggregates, and stores it before transferring to an IoT gateway

2

An **edge IT system** is a platform that filters and pre-processes incoming data from the IoT gateway to minimize the volume of information that will be transferred to the cloud.
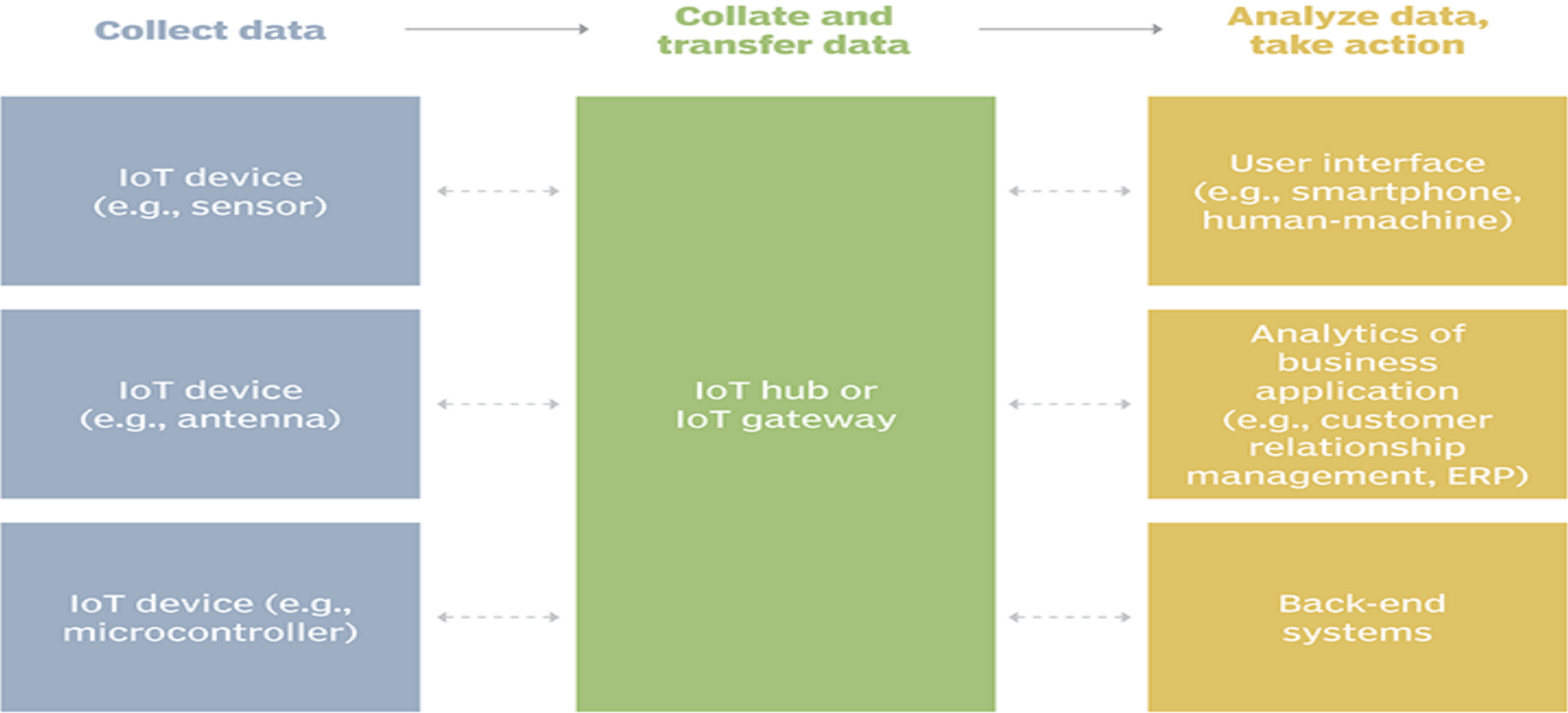
3

The cloud is a cloud-based system (less often - a corporate data center) that provides the processing power for the data that was transferred from an edge platform or an IoT gateway.

4

Example of an IoT system

Collect data → **Collate and transfer data** → **Analyze data, take action**

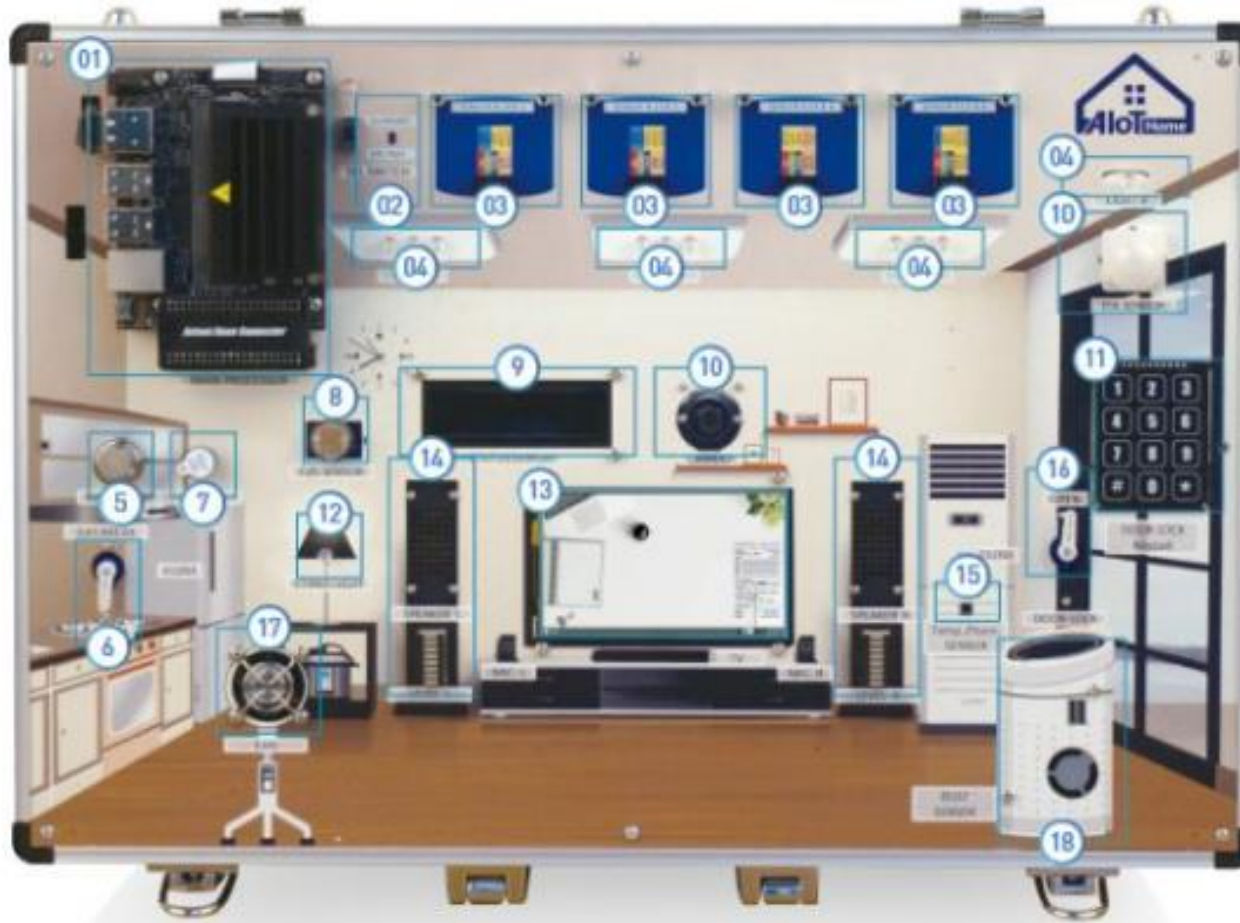| IoT device (e.g., sensor) | ⇠⇢ | IoT hub or IoT gateway | ⇠⇢ | User interface (e.g., smartphone, human-machine) |
| IoT device (e.g., antenna) | ⇠⇢ | | ⇠⇢ | Analytics of business application (e.g., customer relationship management, ERP) |
| IoT device (e.g., microcontroller) | ⇠⇢ | | ⇠⇢ | Back-end systems |

THE BENEFITS OF IOT

The Internet of Things brings several benefits to businesses. Although the needs are different from one sector to another, the advantages provided remain quite similar:

- **A real-time view of all production processes.**

- **Optimization of time , and therefore of expenses.**

- **Improved productivity .**

- **Improved decision making .**

- **The possibility of generating more income .**

IOT APPLICATIONS

Creating better enterprise solutions

Integrating smarter homes

Innovating agriculture

Building smarter cities

Upgrading supply chain management

Transforming healthcare

AIOT HOME

AIoT Home : is compound world AI and IoT, which applying AI to IoT.hanback uses AIoT Home as an **edge device** to learn AIoT.

Edge Device : supports data collection and analysis at edge unlike cloud computing which aggregates and processing data across a network, edge computing is the concept of collecting and processing data on its own in a physically close area.

STRUCTURE OF AIOT HOME

01 Main Processor
02 Connection Select Switch
03 Sensor Block
04 LED Block
05 GAS Sensor
06 GAS Break(Servo Motor)
07 Buzzer
08 CdS Sensor
09 Text LCD
10 Camera
11 Touch Keypad(3 x 4 key)
12 RGB LED
13 TFT LCD
14 Audio Block
(Sound/Speaker/Mic/Level Bar)
15 Temperature/Humidity Sensor
16 Door Lock(Servo Motor)
17 FAN
18 Dust Sensor

SENSORS AND ACTUATORS

Sensors :is an electrical instrument that monitors and measures physical aspects of an environment and sends an electrical signal to a control center when certain pre-determined conditions are detected. Sensors turn physical inputs into electrical signals that are output to the control center.

EX: Pir sensor ,Temperature sensor ,gas sensor.

Actuators: Sensors turn a physical input into an electrical output, and actuators do the opposite. They take electrical signals from control modules and turn them into physical outputs.

Ex: Led ,Buzzer, DC Fan.

GPIO DEVICES OF AIOT HOME

LED BLOCKS

AIoT home has 4leds modules. Three modules uses 3 leds and module 4 uses 1 led.
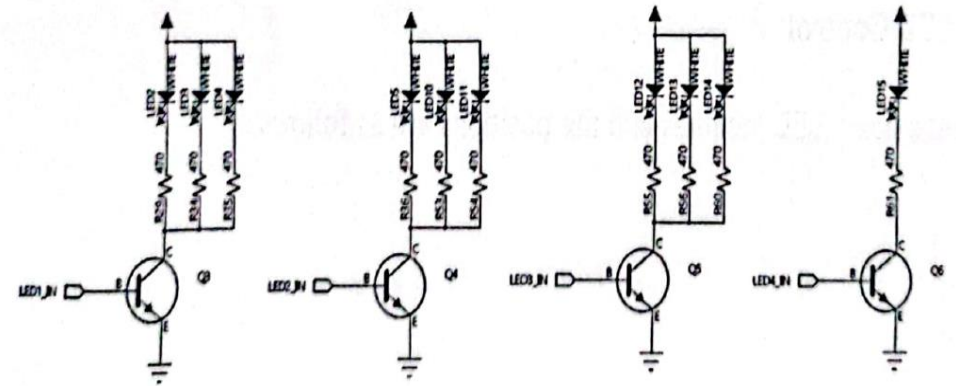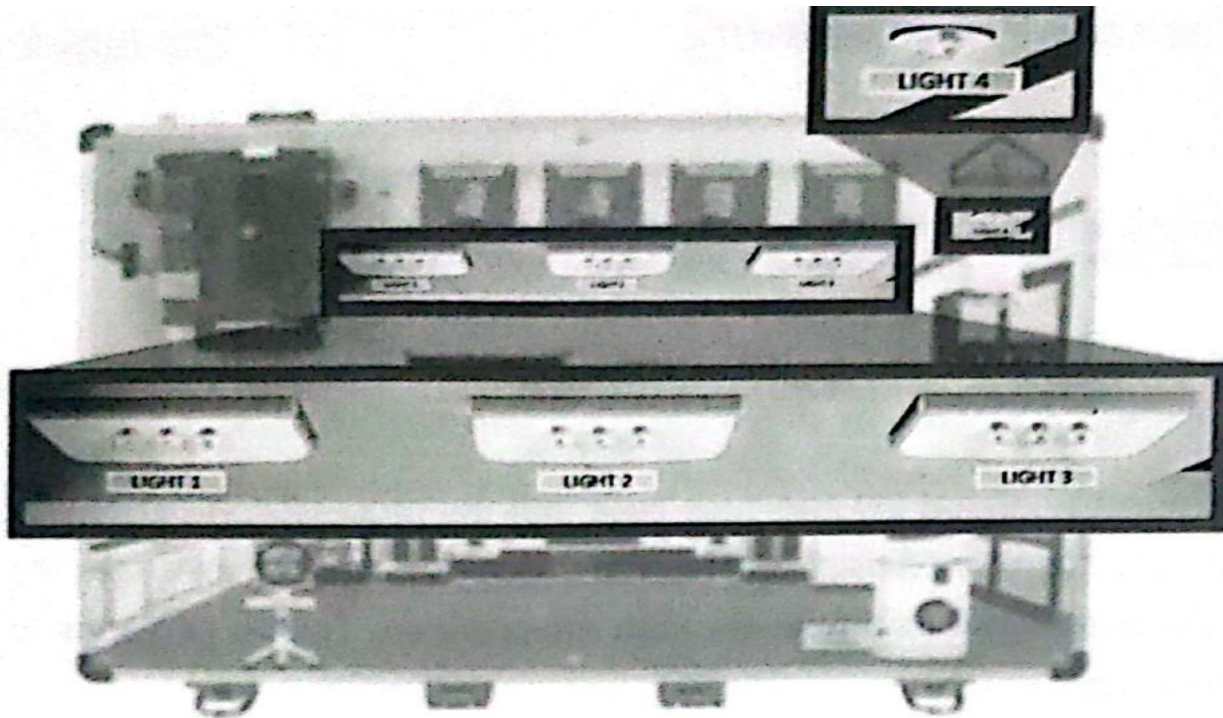
PIEZO BUZZER CONTROL

Sound output device
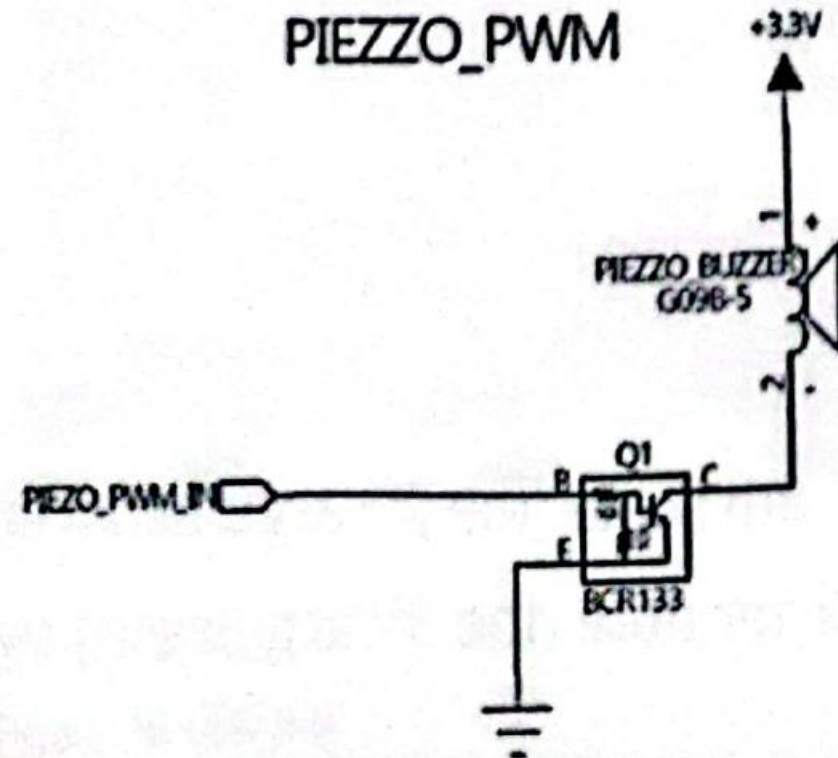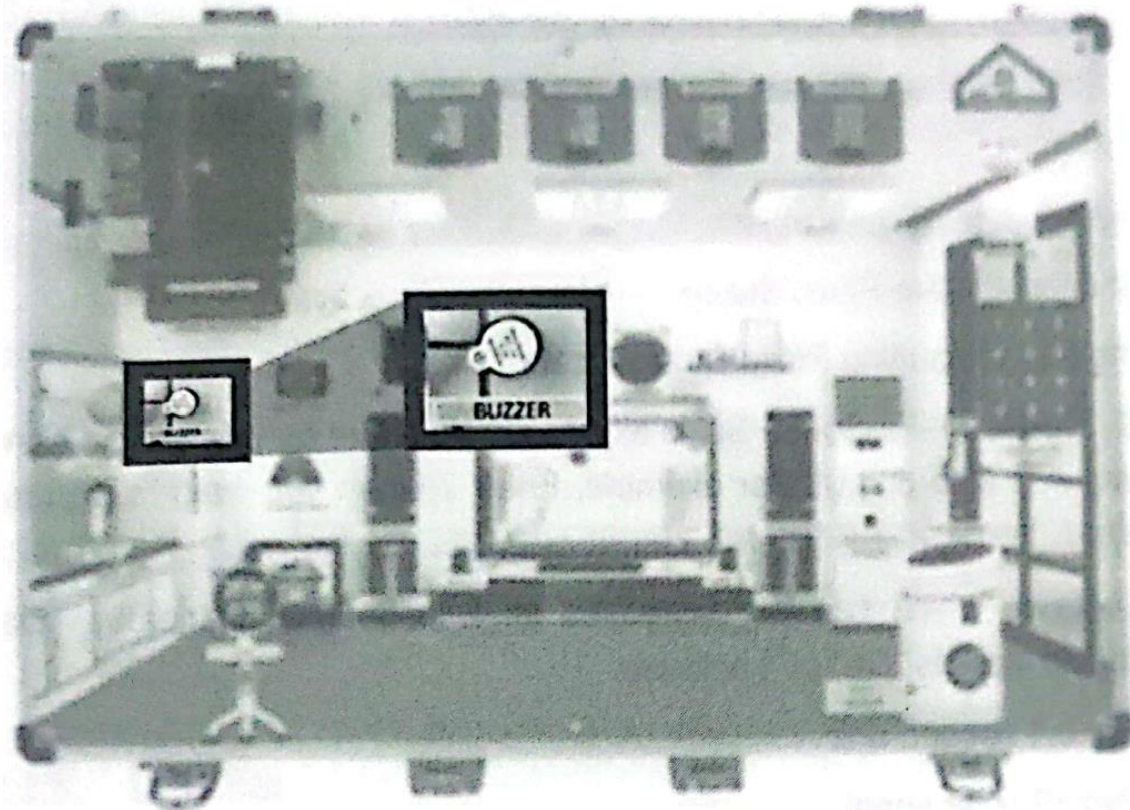
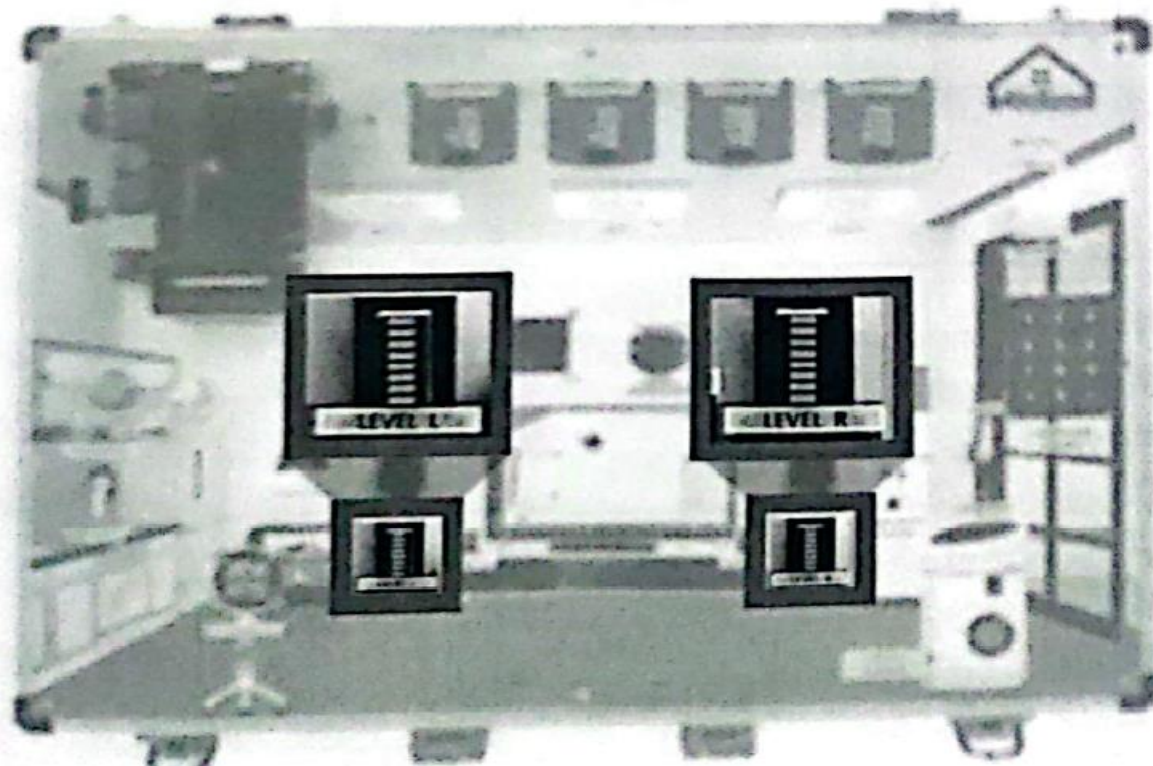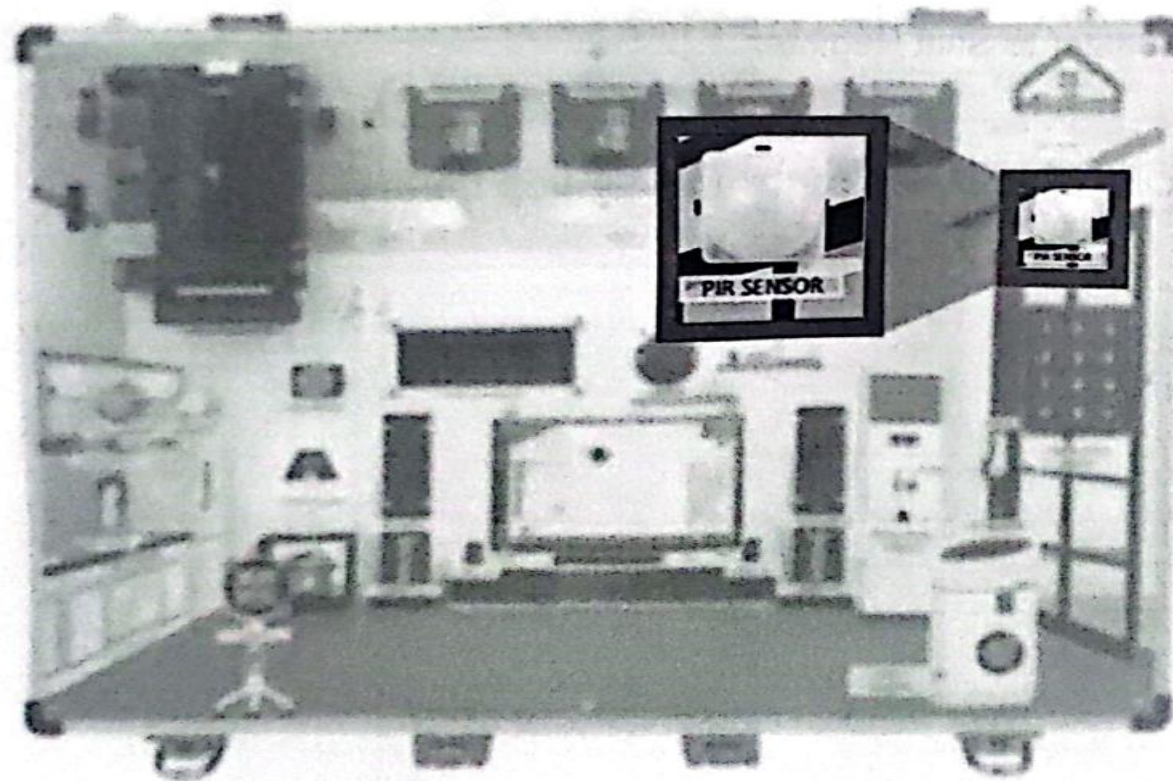# DC FAN CONTROL

Dc motor device
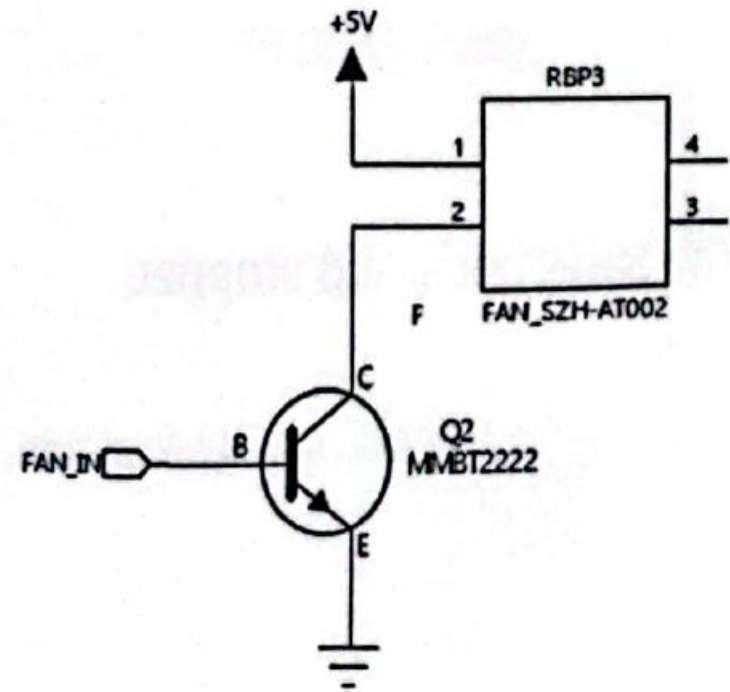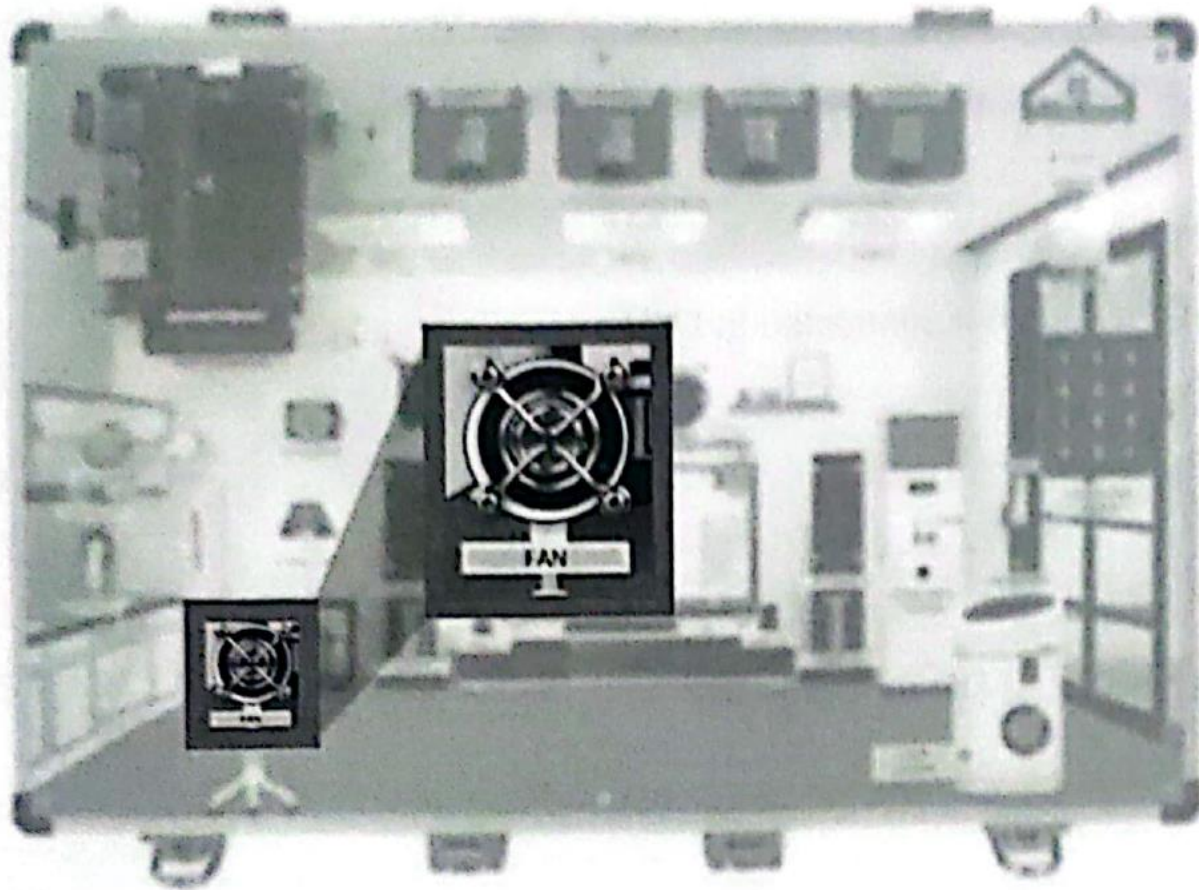
LED BAR

Led Bar is controlled using shift register ic.

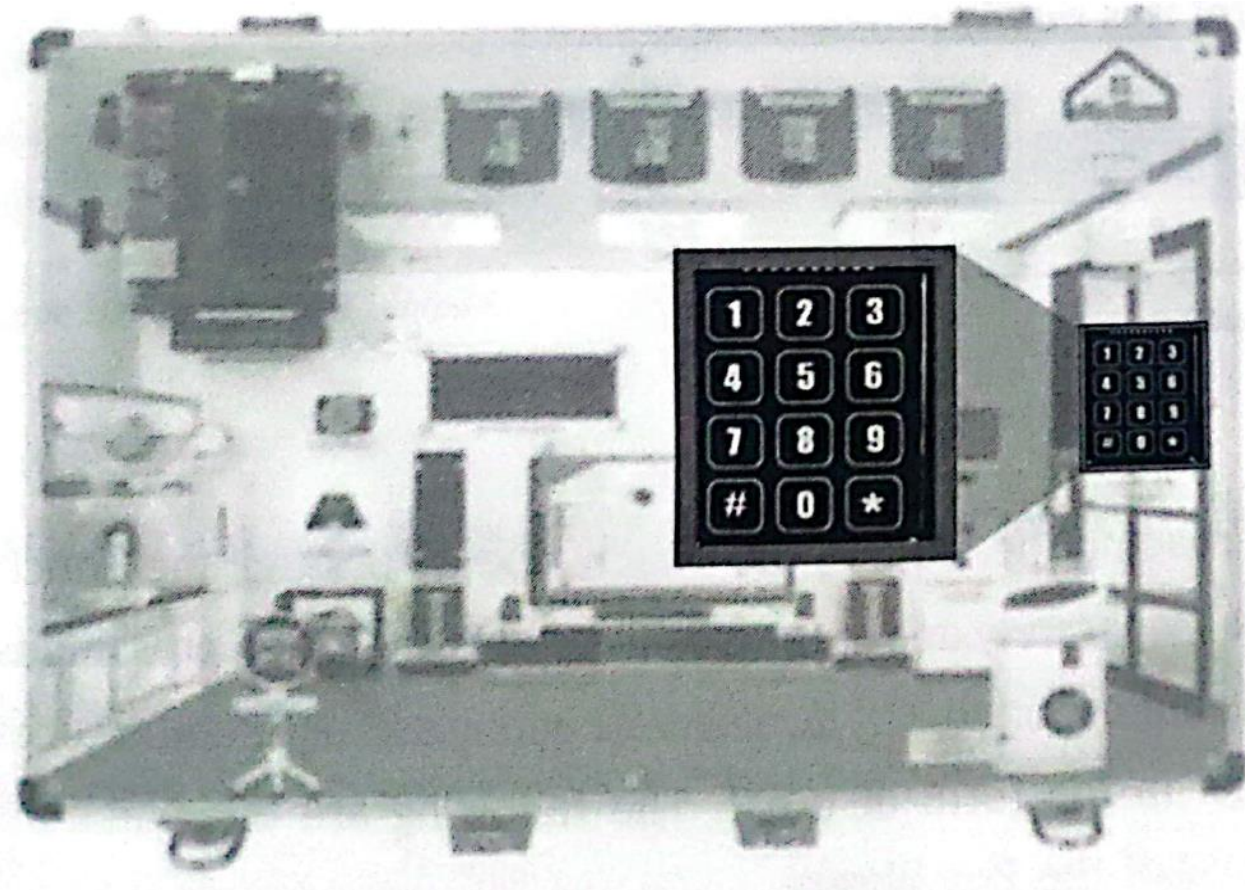# PIR SENSOR

Human body detection input device
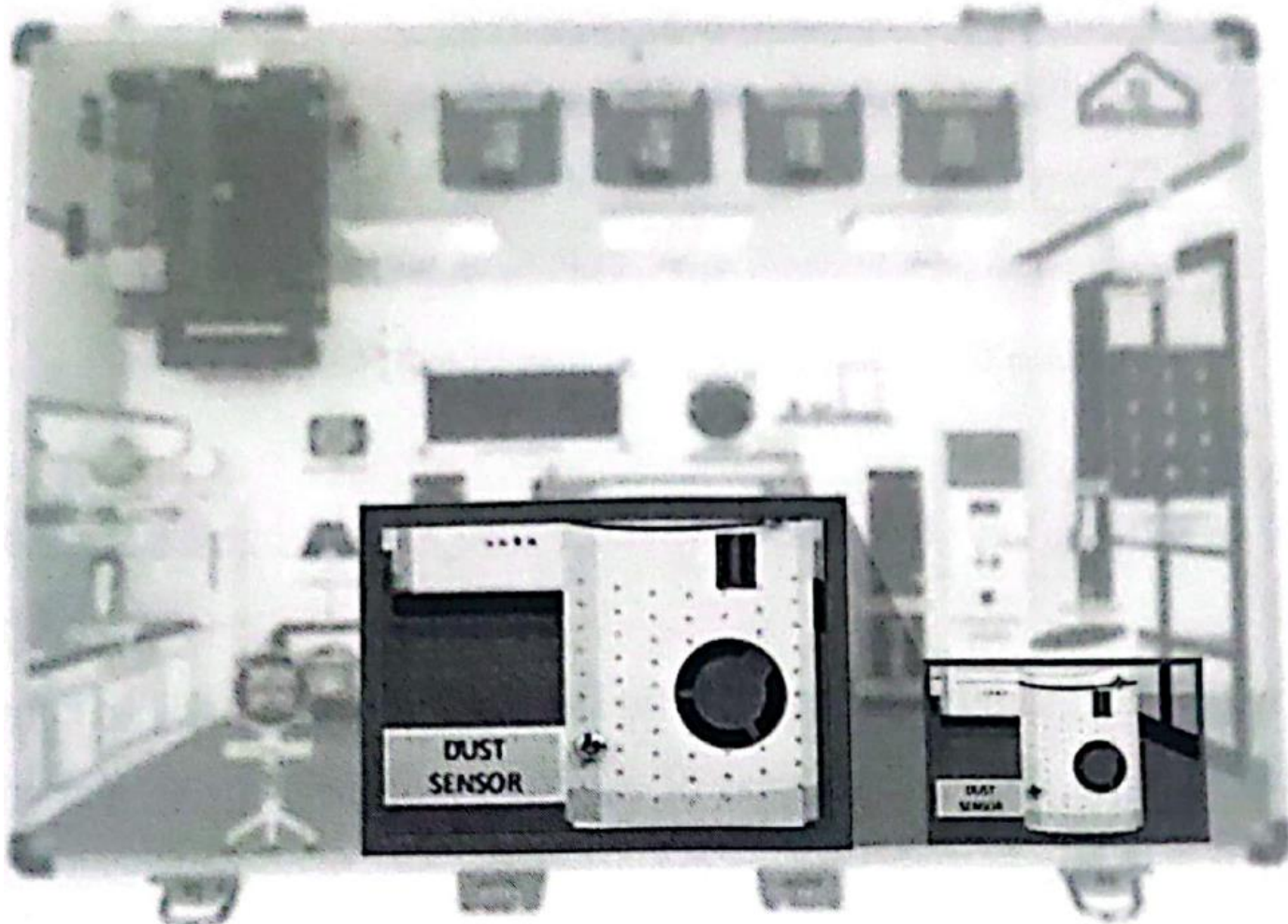
I2C DEVICES OF AIOT HOME

TOUCH KEYPAD

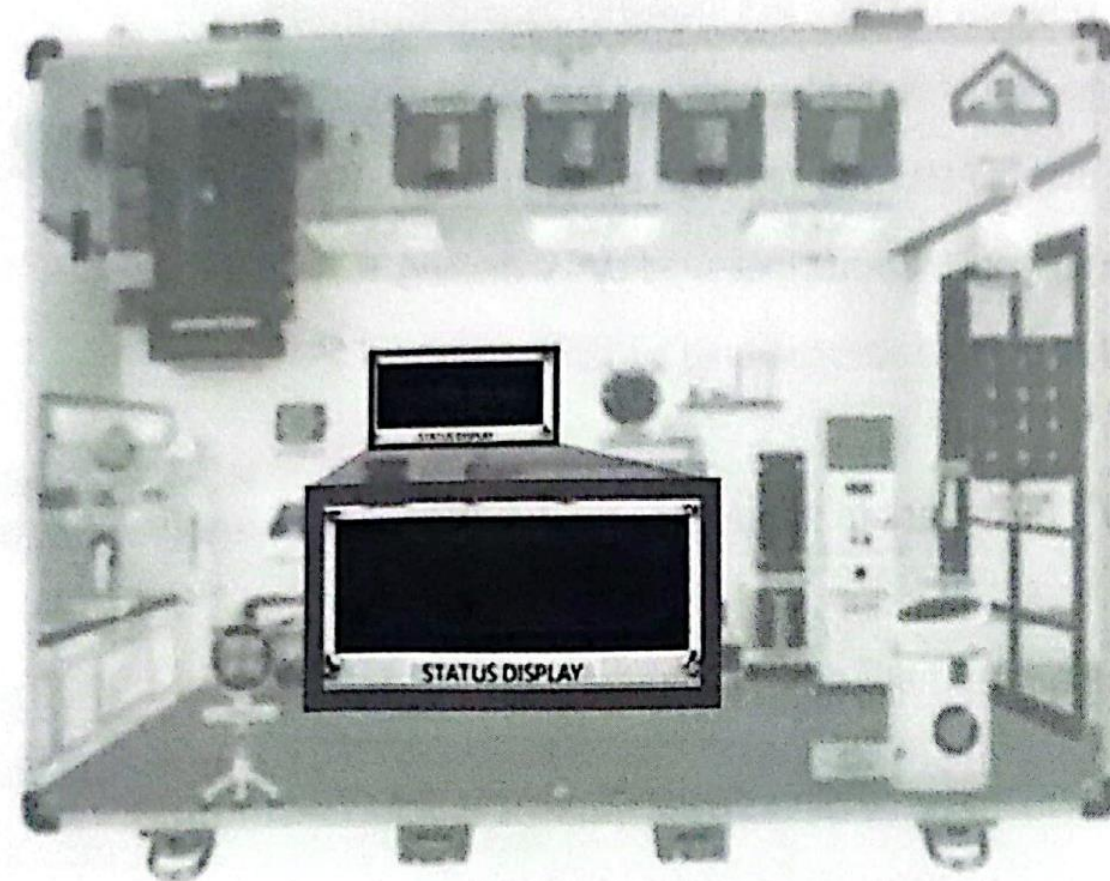**Detect touch on total 12 channels.**
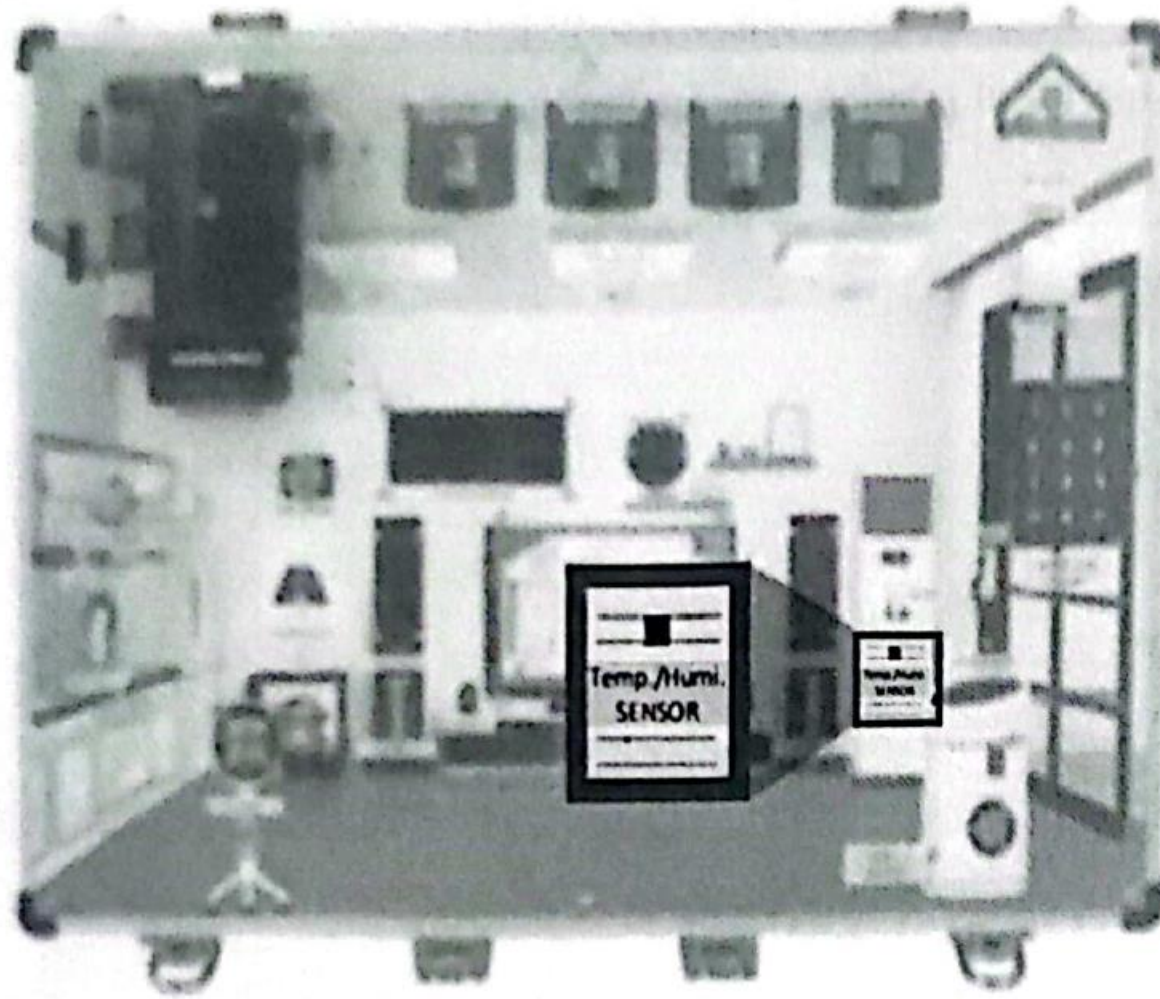
DUST

Measure fine dust around it.

TEXT LCD

Display characters of certain type on the lcd screen.

TEMPERATURE /HUMIDITY SENSOR
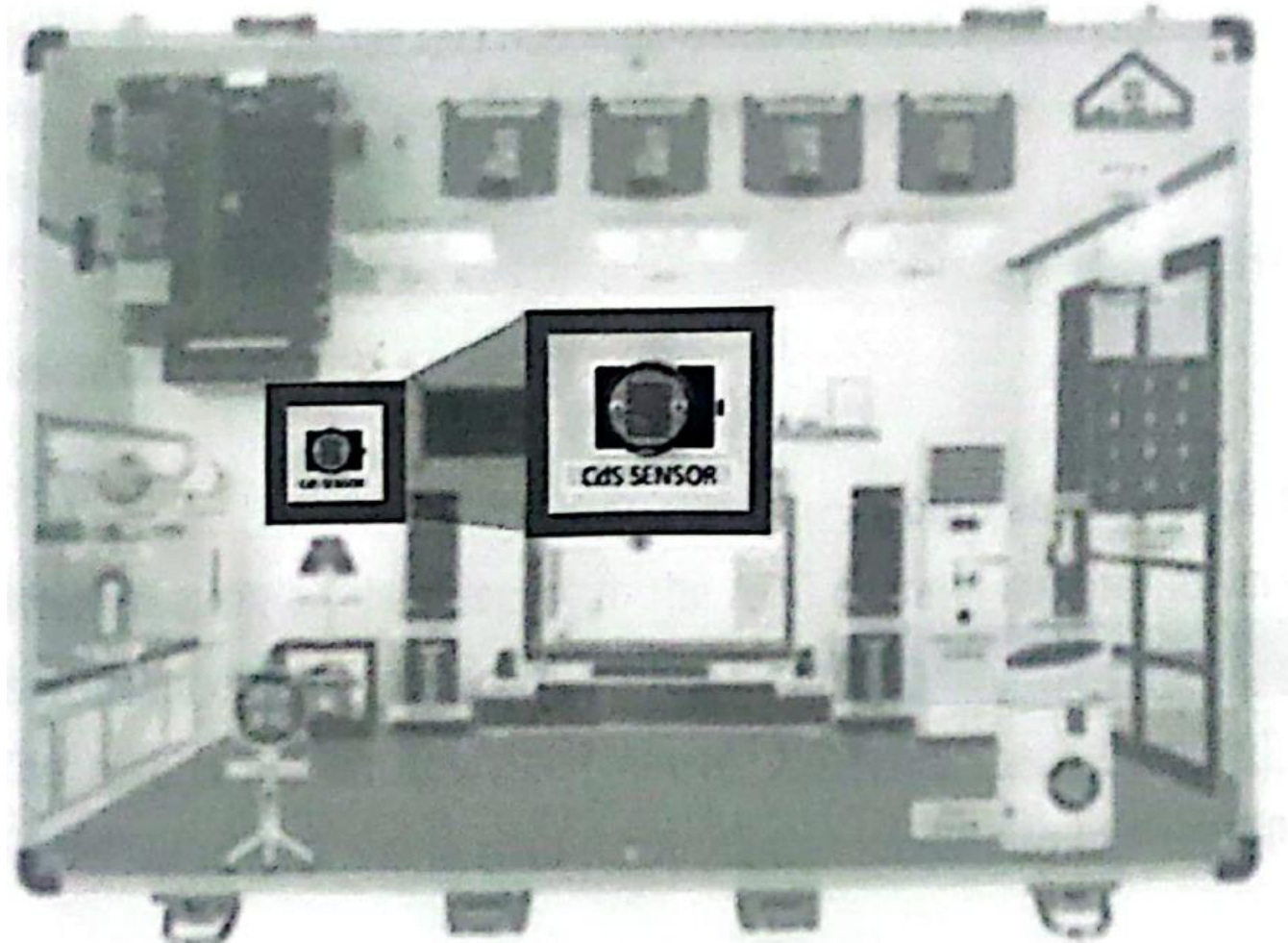
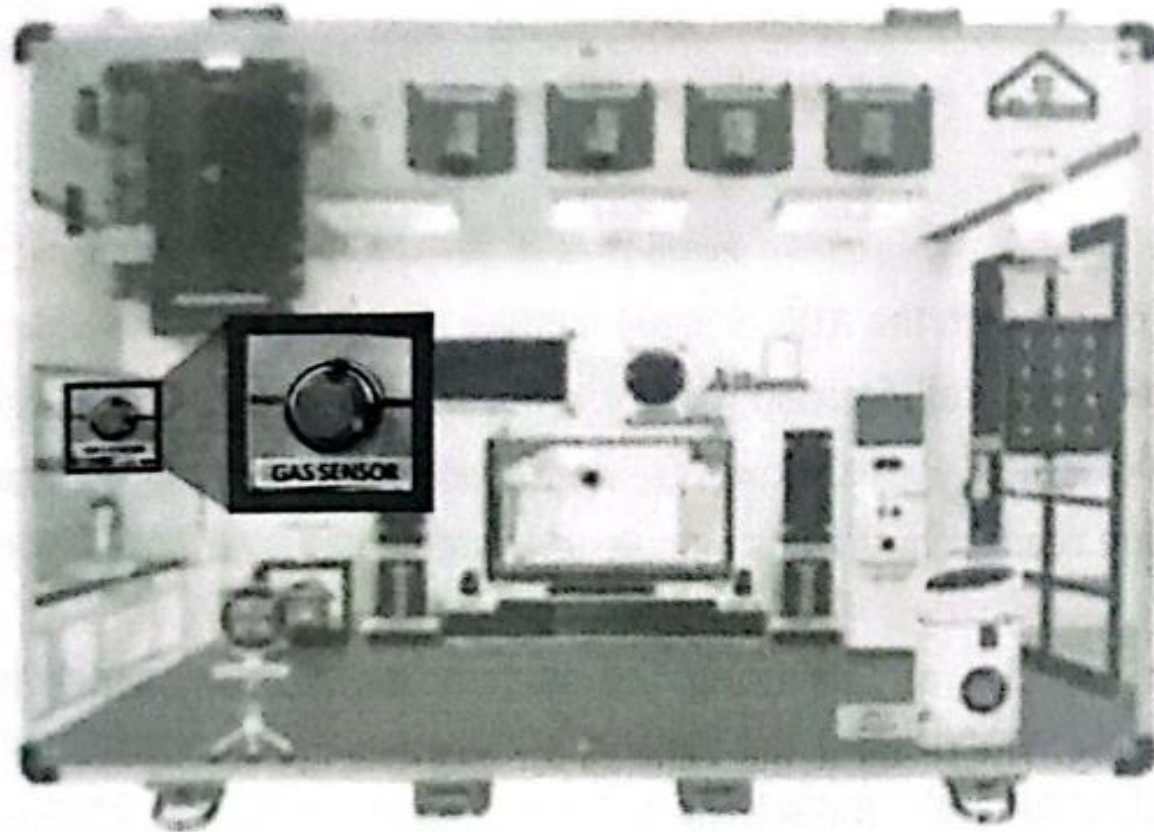**Measure temperature and humidity simultaneously.**

ADC DEVICES OF AIOT HOME

CDS

Measure ambient brightness.
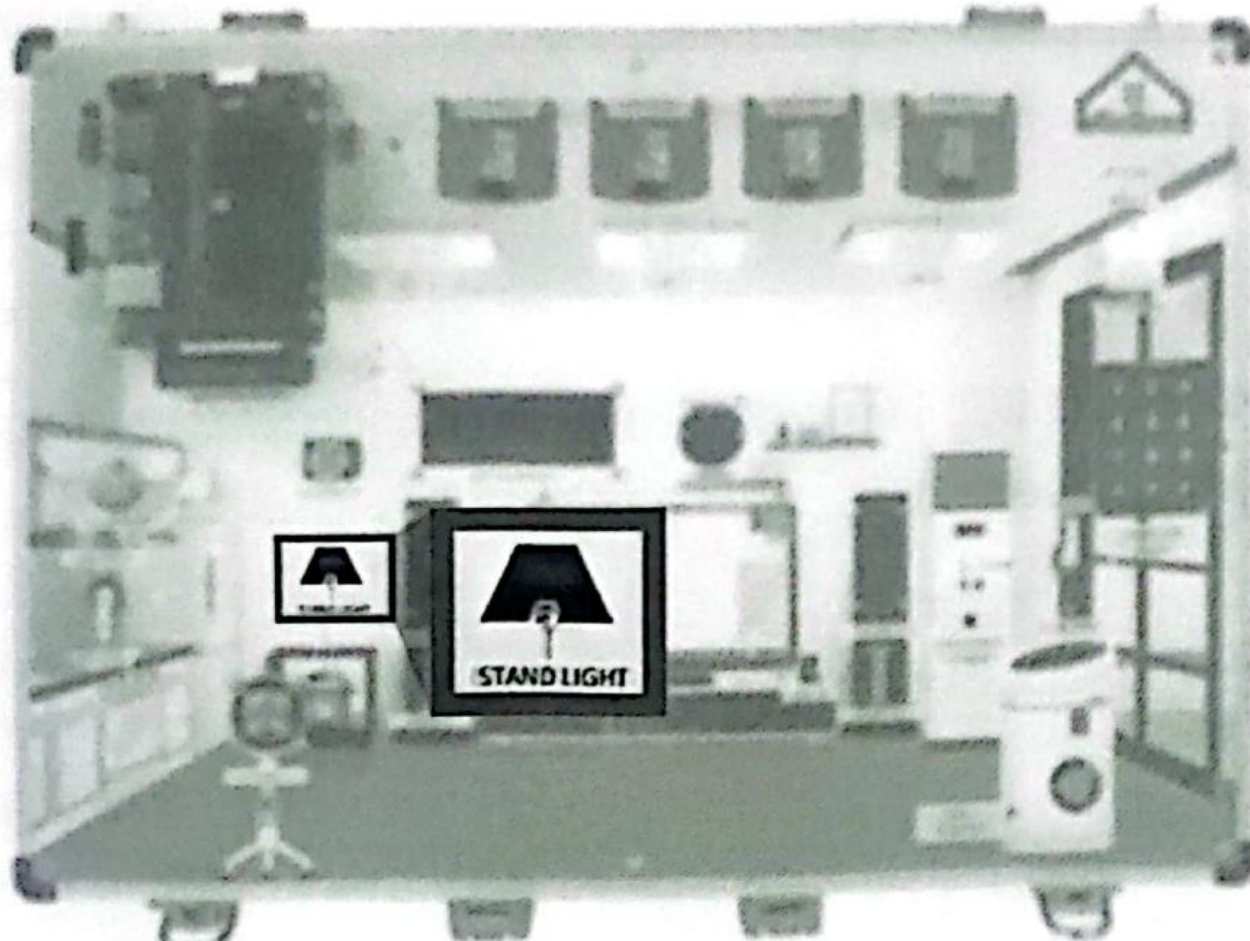
GAS

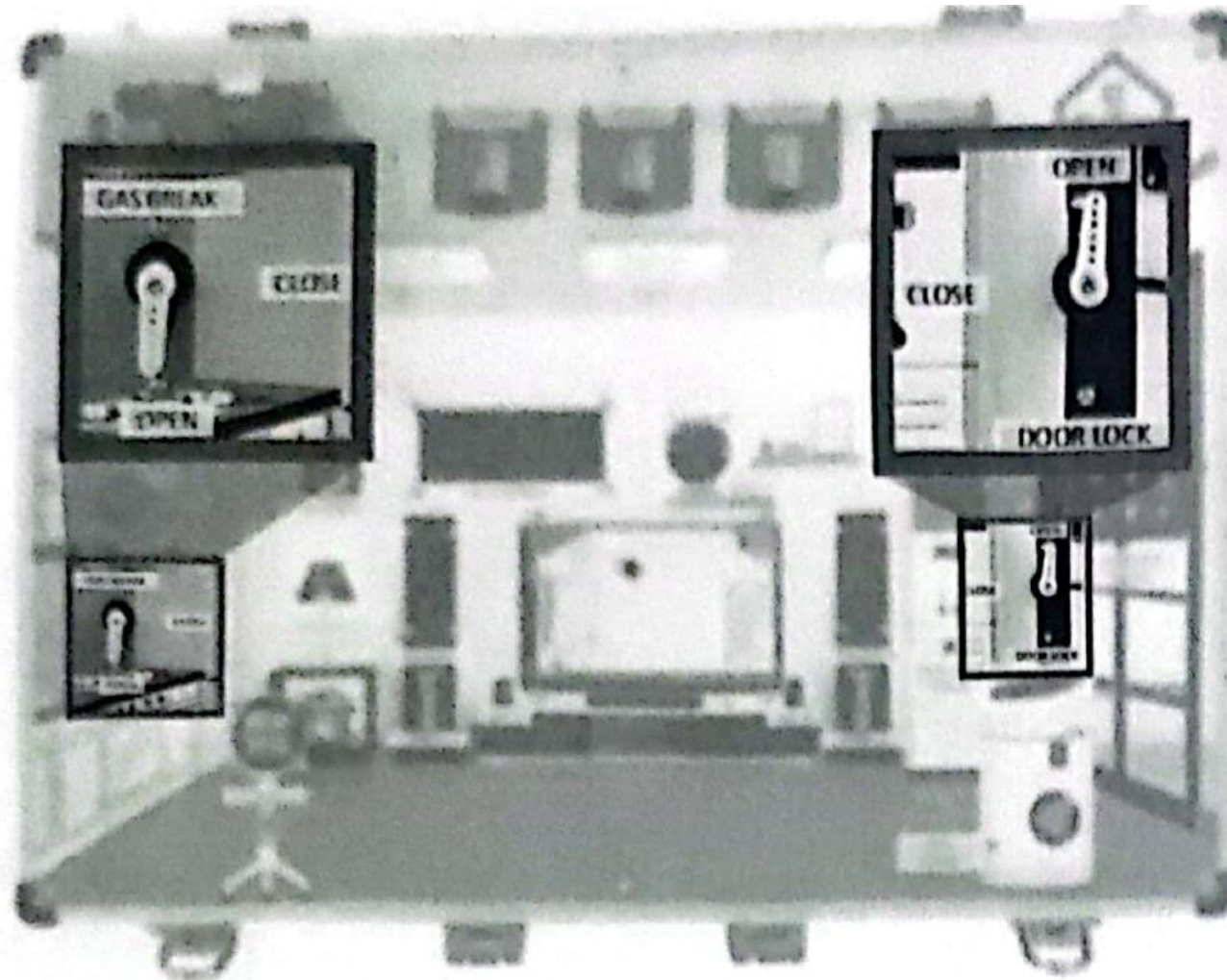**Measure gas such as butane.**

PWM DEVICES OF AIOT HOME

RGB LED

Instead of using only one color led , RGB led uses Combination leds of red, green and blue is used.

SERVO MOTOR

Used in gas break and door lock.

LAB 01
TURN ON LIGHT AND FAN WHEN HUMAN DETECTION

TURN ON LIGHT AND FAN WHEN HUMAN DETECTION

Hardware components :

- Pir sensor.

- leds.

- DC fan.

TURN ON LIGHT AND FAN WHEN HUMAN DETECTION

```python
# lab01:open light and fan when human detection
from pop import Pir,fan,led
import time
# create Pir object and connect to GPIO 22
pir = Pir(22)
# create Led object and connect in GPIO 23
leds=led(23)
#create Dc fan object and connect in GPIO 17
dcfan=fan(17)
while True:
#return value read from cuttrnt input device
    ret = pir.read()
    if (ret == True):
        print("detect...")
# turn on led
        leds.on()
# turn on fan
        dcfan.on()
        time.sleep(2)
    else:
 # turn off leds
        leds.off()
# turn off fan
        dcfan.off()
        time.sleep(0.1)
```