Glatik

INTERNET OF THINGS (IOT)

By Faris V. Zharfan

WHAT IS IOT?

Internet of Things (IoT) is a concept where certain physical objects or devices are equipped with sensors, software, and internet connections that enable them to communicate with each other and exchange data with other devices and computer systems independently.

IOT CONCEPT

IoT allows objects around us to connect and interact with digital infrastructure, enabling better monitoring, control, and automation in various aspects of everyday life, such as healthcare, transportation, smart homes, and industry.

COMPONENT

SENSOR

Collecting physical data from the environment

NETWORK CONNECTION

Enables communication between IoT devices

POWER

Resources such as batteries or electrical power sources

ACTUATOR

Act on instructions received

MICROCONTROLLER

Processing data from sensors

IOT APPLICATIONS

The end user interface that controls the IoT.

SMART HOME

A smart home is a home equipped with sensors that monitor activity and assist in its operation. Smart homes can provide several types of services, such as remote or automated operation of lights and appliances.

IOT IMPLEMENTATION

HEALTH

Real-Time Patient Health Monitoring, Drug Stock Monitoring and Management.

SMART HOME

Lighting Automation, Temperature Control, Home Security.

TRANSPORTATION

Traffic Monitoring System, Smart Parking Management, Autonomous Vehicles.

INDUSTRY

Smart Manufacturing, Machine Maintenance Prediction, Supply Chain Management.

MAIN COMPONENTS IN A SMART HOME

ESP32

Used as a microcontroller/main control.

LM2596

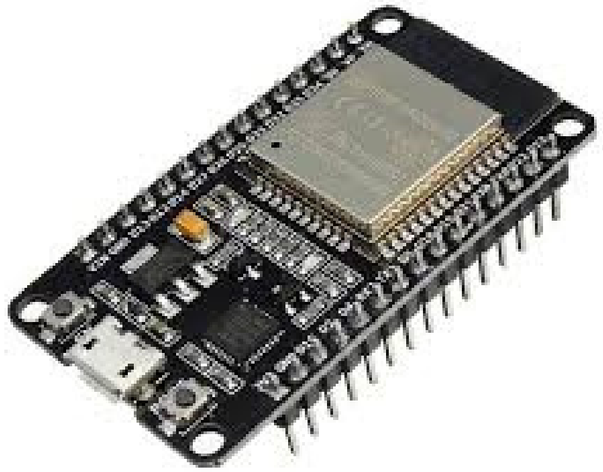
Used as a battery voltage reducer.

9v battery

Used as power for the microcontroller.

MAIN COMPONENTS IN A SMART HOME

ESP32



LM2596

9v battery

SMART HOME SUPPORTING COMPONENTS

WIRE/CABLE

To connect the components.

BATTERY BUTTON

To connect the battery with LM2596.

PCB

As a storage and connector for ESP32.

SWITCH

As turning on and off the ESP32.

RESISTOR

As a current limiter for LEDs.

LED

As lights in a smart home.

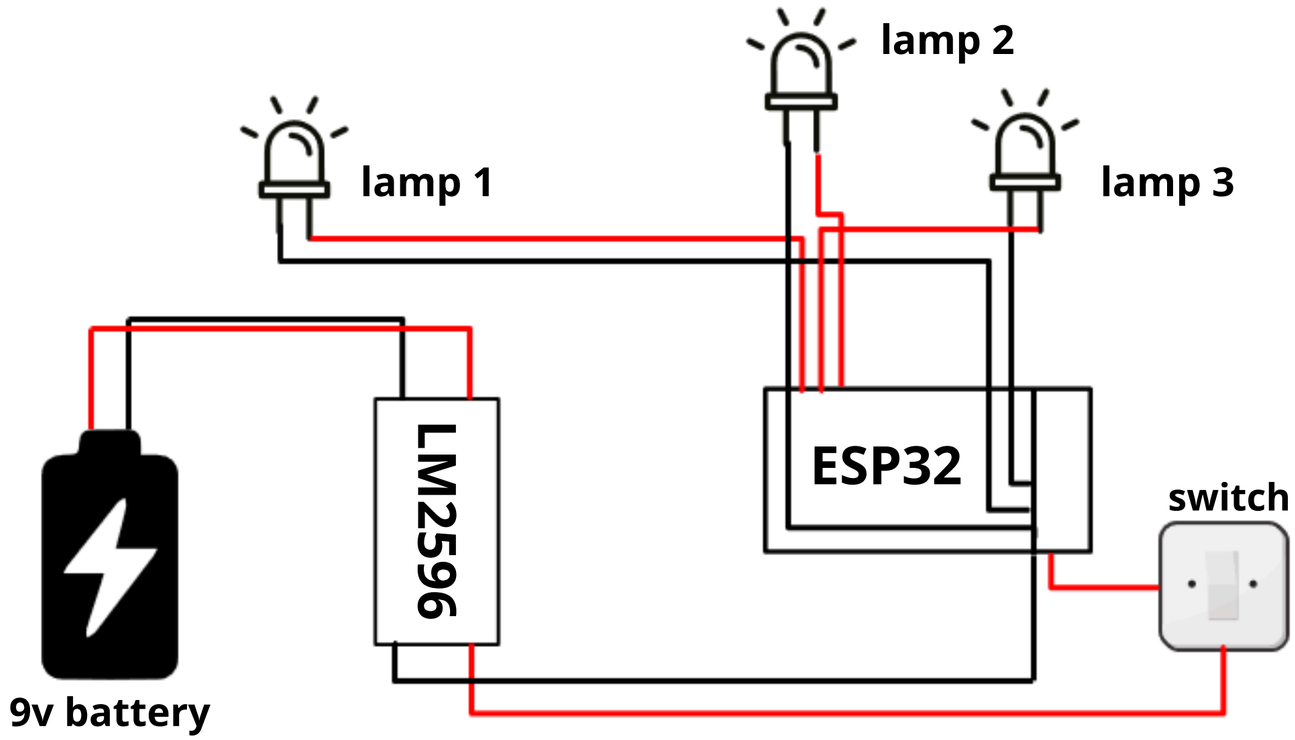
ESP32

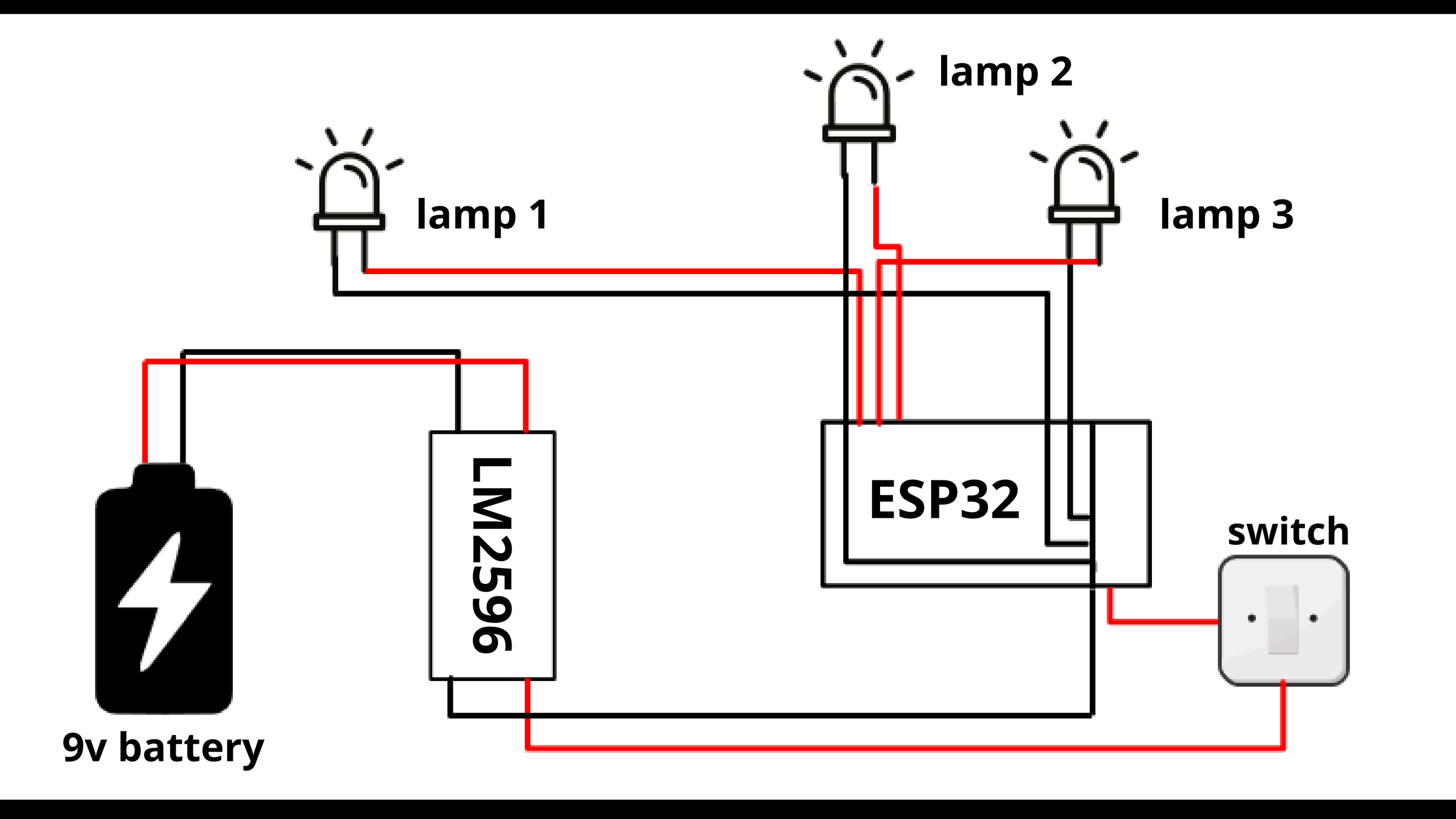
ESP32 is a microcontroller or a chip that can be controlled by a C++ code uploaded to it. ESP32 is equipped with a Bluetooth and WiFi module, allowing this microcontroller to connect to the internet and be used as an IoT tool.

COMPONENT DIAGRAM

= Ground/(-)

= Positive/(+)

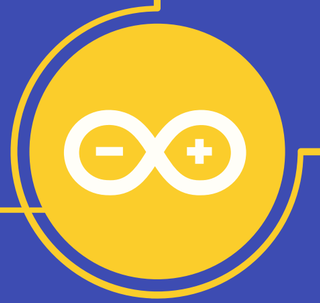


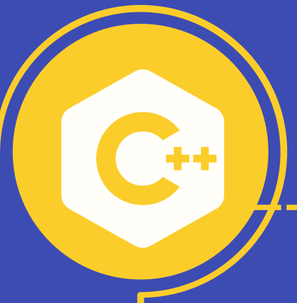

lamp 2
lamp 1
lamp 3
LM2596
ESP32
switch
9v battery

How Smart Homes Work

ESP32 tries to connect to the internet

After connecting the ESP32 will be connected to the Arduino cloud.





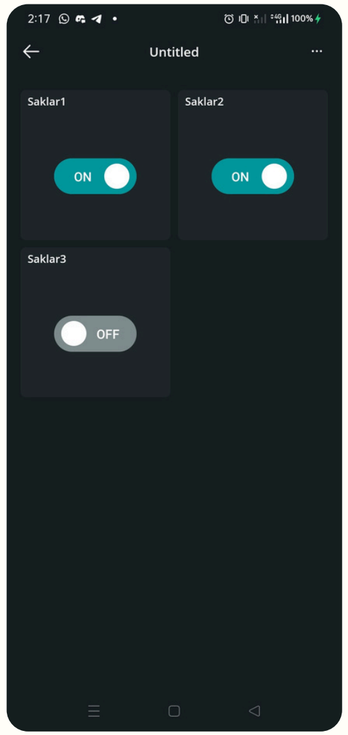
Cloud arduino will read and manage code on ESP32 via internet

Cloud arduino then connects with google home

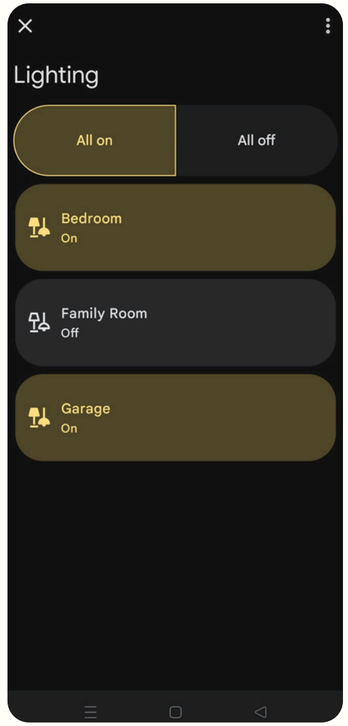
Google home will use google assistant as a switch

SWITCH VIEW ON THE APPLICATION

Switch View On Arduino IoT remote



Switch View On Google Home



CONCLUSION

The implementation of the Internet of Things (IoT) offers significant potential for increasing efficiency, innovation, and connectivity across various sectors. Despite challenges such as security, interoperability, and power constraints, IoT offers significant opportunities for improving operational efficiency, enabling product and service innovation, providing broader connectivity, and enabling predictive analytics.


THANK
YOU