Date:

EXPERIMENT: 9

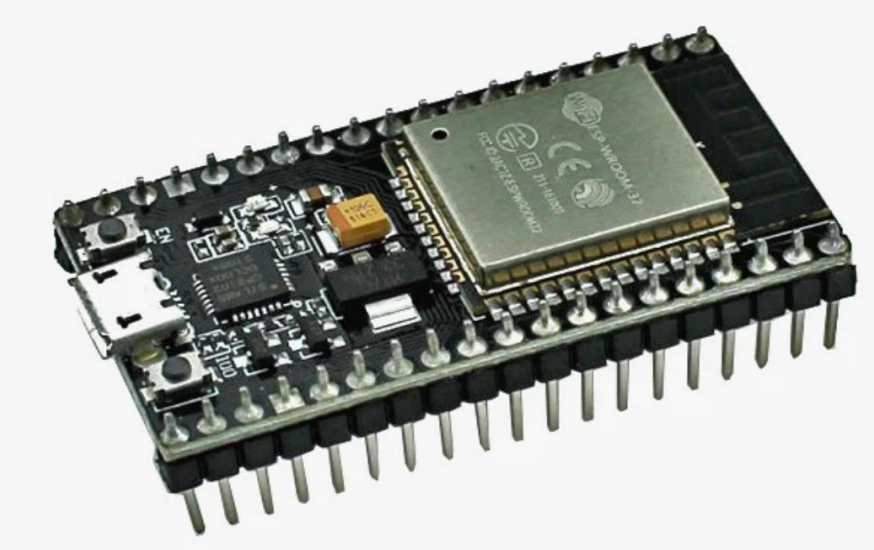
AIM: Introduction to Arduino/ESP32 & implement sample programs of i. Blink LED, ii. LED with timer and iii. LED control from Switch.

OBJECTIVES:

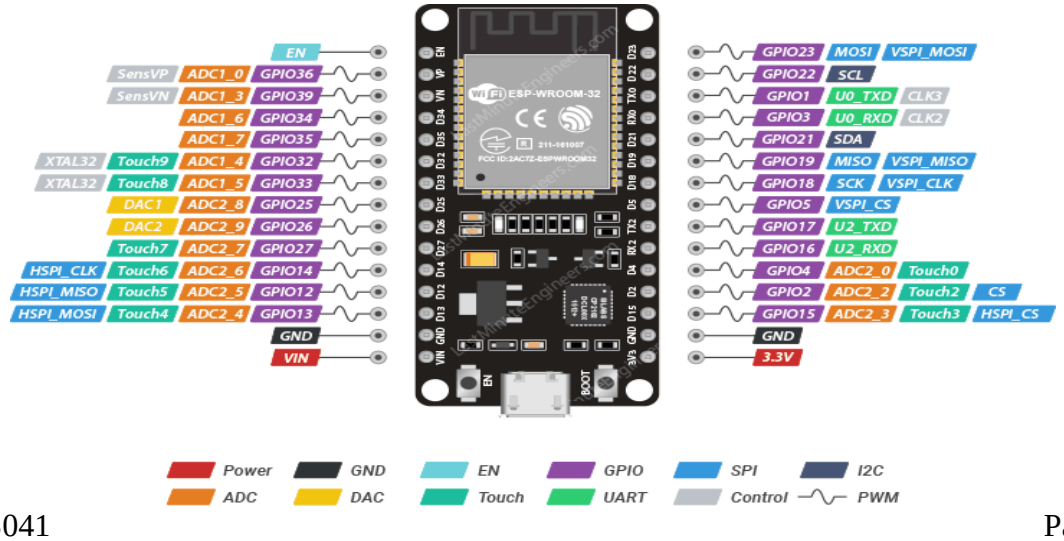
1. To study datasheet and Pin diagram of ESP32
2. Implement Blink LED program.
3. Implement program to control LED intensity with timer.
4. Implement program to control LED from switch

COMPONENTS:

1) ESP32:



ESP32 is a series of low-cost, low-power microcontrollers with integrated Wi-Fi and Bluetooth connectivity. It is suitable for a wide range of IoT applications and can be programmed using various languages and frameworks.



2) USB Cable:

USB cables are cables that can be used to connect, charge, and transfer data between various devices, such as computers, smartphones, cameras, and more.

3) LED:

LED stands for light-emitting diode, which is a semiconductor device that emits light when an electric current flows through it.

4) Button:

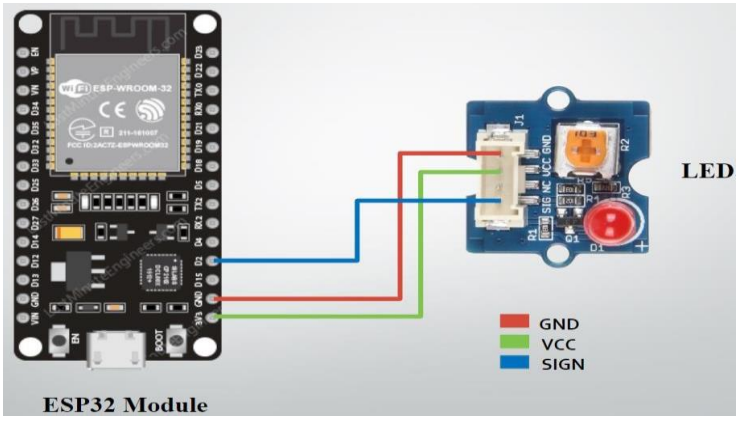
Grove button is a type of button that can be used with the Grove system, which is a modular and easy-to-use platform for connecting sensors, actuators, and displays.

5) jumper wire:

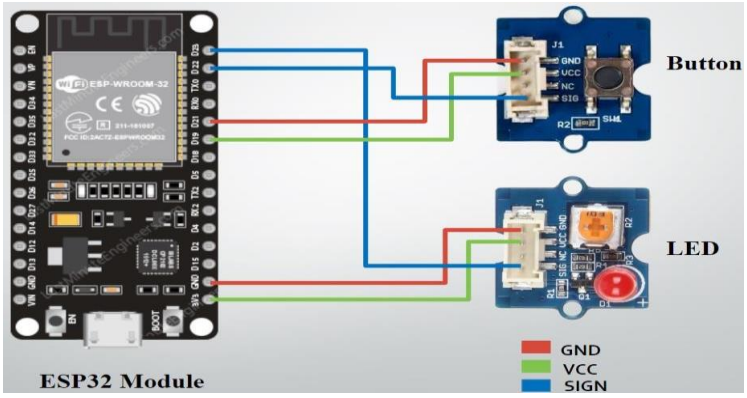
Jumper wires are wires that have connectors or pins at each end, which can be used to connect two points in a circuit without soldering.

CONNECTION DIAGRAM:

a) 9.1 and 9.2



b) 9.3:



CODES:

1.

9.1:

```
const int ledpin=2;
 void setup()
{
pinMode(ledpin,OUTPUT);
}
void loop()
{
digitalWrite(ledpin,HIGH);
delay(1000) digitalWrite(ledpin,LOW);
delay(1000);
}
```

9.2:

```
int led = 23;
int brightness = 0;
int fadeAmount = 5;
void setup()
{
pinMode(led,OUTPUT);
}
void loop()
{
analogWrite(led,brightness);
brightness=brightness + fadeAmount;
if (brightness <=0 || brightness >= 255)
{
fadeAmount = -fadeAmount;
}

delay(30);
}
```

9.3:

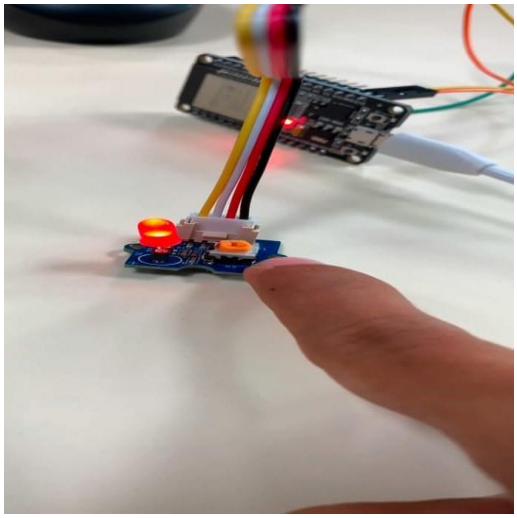
```
const int buttonPin = 22;
const int ledPin = 23;
const int suppl = 19;
const int groun = 21;
int buttonState = 0;
void setup()
{
pinMode(ledPin, OUTPUT);
pinMode(buttonPin, INPUT); pinMode(suppl, OUTPUT);
pinMode(groun, OUTPUT);
digitalWrite(suppl, HIGH);
```

```
digitalWrite(groun, LOW);
}
void loop()
{
buttonState = digitalRead(buttonPin);
if (buttonState == HIGH)
{
digitalWrite(ledPin, HIGH);
}
else
{
digitalWrite(ledPin, LOW);
}
}
```

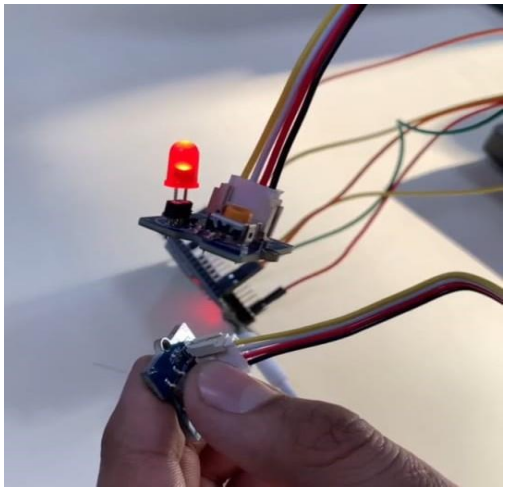
OUTPUTS:

9.1:

9.2:



9.3:



OBSERVATIONS:

CONCLUSION:

DRIVE LINK OF VIDEO:

9.1: **https://drive.google.com/file/d/1bHL3bfXyaidL2OhV-fBAS9NkO7wah1p-/view?usp=drivesdk**

9.2: https://drive.google.com/file/d/1TanKtVY7TQ2s4jOED6_SgpJugeTpdEca/view?usp=drivesdk

9.3:https://drive.google.com/file/d/1csVqUcZhEGe4QWQBSREbga7n5atPJFqZ/view?usp=drivesdk

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