

1)

```
const int button = 4;
```

```
const int ledPin = 13;
```

```
int button_State = 0;
```

```
void setup() {
```

```
    Serial.print(9600);
```

```
    pinMode(ledPin, OUTPUT);
```

```
    pinMode(button, INPUT);
```

```
}
```

```
void loop() {
```

```
    button_State = digitalRead(button);
```

```
    if (button_State == LOW) {
```

```
        digitalWrite(ledPin, HIGH);
```

```
    }
```

```
    else {
```

```
        // turn LED off:
```

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

```
    }
```

```
}
```

2)

```
const int carRed = 25;
```

```
const int carYellow = 26;
```

```
const int carGreen = 27;
```

```
const int pedRed = 14;
```

```
const int pedGreen = 12;
```

```
void setup() {
```

```
    pinMode(carRed, OUTPUT);
```

```
    pinMode(carYellow, OUTPUT);
```

```
    pinMode(carGreen, OUTPUT);
```

```
    pinMode(pedRed, OUTPUT);
```

```
    pinMode(pedGreen, OUTPUT);
```

```
    digitalWrite(carGreen, HIGH);
```

```
    digitalWrite(pedRed, HIGH);
```

```
}
```

```
void loop() {
```

```
    digitalWrite(carGreen, HIGH);
```

```
    digitalWrite(carYellow, LOW);
```

```
    digitalWrite(carRed, LOW);
```

```
    digitalWrite(pedGreen, LOW);
```

```
    digitalWrite(pedRed, HIGH);
```

```
    delay(5000);
```

```
    digitalWrite(carGreen, LOW);
```

```
    digitalWrite(carYellow, HIGH);
```

```
    delay(2000);
```

```
    digitalWrite(carYellow, LOW);
```

```
digitalWrite(carRed, HIGH);  
digitalWrite(pedRed, LOW);  
digitalWrite(pedGreen, HIGH);  
delay(5000);  
digitalWrite(pedGreen, LOW);  
digitalWrite(pedRed, HIGH);  
for (int i = 0; i < 3; i++) {  
    digitalWrite(carYellow, HIGH);  
    delay(500);  
    digitalWrite(carYellow, LOW);  
    delay(500);  
}  
}
```

3)

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

```
delay(30);  
}
```

4)

```
#define led1 12  
#define led3 13  
#define led5 14  
#define led2 25  
#define led4 26  
#define led6 27  
  
void setup() {  
  
  pinMode(led1, OUTPUT);  
  pinMode(led2, OUTPUT);  
  pinMode(led3, OUTPUT);  
  pinMode(led4, OUTPUT);  
  pinMode(led5, OUTPUT);  
  pinMode(led6, OUTPUT);  
}  
  
void loop() {  
  
  digitalWrite(led1, HIGH);  
  digitalWrite(led3, HIGH);  
  digitalWrite(led5, HIGH);  
  
  digitalWrite(led2, LOW);  
  digitalWrite(led4, LOW);  
  digitalWrite(led6, LOW);
```

```
delay(5000);  
digitalWrite(led1, LOW);  
digitalWrite(led3, LOW);  
digitalWrite(led5, LOW);  
  
digitalWrite(led2, HIGH);  
digitalWrite(led4, HIGH);  
digitalWrite(led6, HIGH);  
delay(5000);  
}
```

```
5)  
#include <ESP32Servo.h>  
  
Servo myServo;  
  
int pos = 0;  
  
void setup() {  
  myServo.attach(4);  
}  
  
void loop() {  
  
  for (pos = 0; pos <= 180; pos += 1) {  
    myServo.write(pos);  
    delay(15);  
  }  
  
  for (pos = 180; pos >= 0; pos -= 1) {  
    myServo.write(pos);  
    delay(15);  
  }  
}
```

```
}
```

6)

```
#define ldrPin 15
```

```
#define ledPin 4
```

```
int ldrValue = 0;
```

```
int ledBrightness = 0;
```

```
void setup() {
```

```
  pinMode(ledPin, OUTPUT);
```

```
  Serial.begin(9600);
```

```
}
```

```
void loop() {
```

```
  ldrValue = analogRead(ldrPin);
```

```
  ledBrightness = map(ldrValue, 0, 1023, 0, 255);
```

```
  analogWrite(ledPin, ledBrightness);
```

```
  Serial.print("LDR Value: ");
```

```
  Serial.print(ldrValue);
```

```
  Serial.print(" LED Brightness: ");
```

```
  Serial.println(ledBrightness);
```

```
  delay(100);
```

```
}
```

7)

```
#define potPin 15
```

```
#define ledPin 4
```

```
int potValue = 0;
int ledBrightness = 0;
void setup() {
  pinMode(ledPin, OUTPUT);
  Serial.begin(9600);
}
void loop() {

  potValue = analogRead(potPin);

  ledBrightness = map(potValue, 0, 1023, 0, 255);

  analogWrite(ledPin, ledBrightness);

  Serial.print("Pot Value: ");
  Serial.print(potValue);
  Serial.print(" LED Brightness: ");
  Serial.println(ledBrightness);
  delay(100);
}
```

8)

```
#include "Arduino.h"
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_ST7735.h>
#include <SPI.h>
#include "DHT.h"
#define DHTPIN 4
```

```
#define DHTTYPE DHT11

DHT dht(DHTPIN, DHTTYPE);


#define TFT_CS 14
#define TFT_RST 12
#define TFT_DC 13
#define TFT_SCLK SCL
#define TFT_MOSI SDA

Adafruit_ST7735 tft = Adafruit_ST7735(TFT_CS, TFT_DC, TFT_MOSI,
TFT_SCLK, TFT_RST);

float t;

float h;

void setup() {

  Serial.begin(9600);

  Serial.println("DHTxx test!");

  dht.begin();


  tft.initR(INITR_BLACKTAB);
  tft.setTextWrap(false);
  tft.fillScreen(ST7735_BLACK);
}

void loop() {

  Dhtread();

  Display();

  delay(100);

}

void Dhtread(void)

{
```



```
delay(2000);
```

```
h = dht.readHumidity();
```

```
t = dht.readTemperature();
```

```
if (isnan(h) || isnan(t)) {
```

```
Serial.println("Failed to read from DHT sensor!");
```

```
return;
```

```
}
```

```
Serial.print("Humidity: ");
```

```
Serial.print(h);
```

```
Serial.print("% Temperature: ");
```

```
Serial.print(t);
```

```
}
```

```
void Display(void) {
```

```
tft.fillScreen(0x0000);
```

```
tft.setRotation(1);
```

```
tft.setCursor(0, 30);
```

```
tft.setTextColor(ST7735_YELLOW);
```

```
tft.setTextSize(2);
```

```
tft.println("Temp C: ");
```

```
tft.setCursor(60, 30);
```

```
tft.setTextColor(ST7735_YELLOW);
```

```
tft.setTextSize(1);
```

```
tft.println(t);
```

```
tft.setCursor(0, 90);
```

```
tft.setTextColor(ST7735_YELLOW);
```

```
tft.setTextSize(1);  
tft.println("Hum %: ");  
tft.setCursor(60, 90);  
tft.setTextColor(ST7735_YELLOW);  
tft.setTextSize(1);  
tft.println(h);  
delay(3000);  
}
```

9)

```
const int ledPins[] = {12, 13, 14, 25, 26, 27}; // Define LED pins
```

```
const int numLeds = 6;
```

```
void setup() {
```

```
  for (int i = 0; i < numLeds; i++) {
```

```
    pinMode(ledPins[i], OUTPUT);
```

```
  }
```

```
}
```

```
void loop() {
```

```
  for (int i = 0; i < numLeds; i++) {
```

```
    digitalWrite(ledPins[i], HIGH);
```

```
    delay(1000);
```

```
    digitalWrite(ledPins[i], LOW);
```

```
  }
```

```
  for (int i = numLeds - 1; i >= 0; i--) {
```

```
    digitalWrite(ledPins[i], HIGH);
```

```
    delay(1000);
```

```
digitalWrite(ledPins[i], LOW);  
}
```

10)

```
#define TRIG 14
```

```
#define ECHO 12
```

```
#define SOUND_SPEED 0.0343
```

```
#define C_M_TO_INCH 0.393701
```

```
long duration;
```

```
float distanceCm;
```

```
float distanceInch;
```

```
void setup() {
```

```
  Serial.begin(9600);
```

```
  pinMode(TRIG, OUTPUT);
```

```
  pinMode(ECHO, INPUT);
```

```
}
```

```
void loop() {
```

```
  digitalWrite(TRIG, LOW);
```

```
  delayMicroseconds(2);
```

```
  digitalWrite(TRIG, HIGH);
```

```
  delayMicroseconds(10);
```

```
  digitalWrite(TRIG, LOW);
```

```
  duration = pulseIn(ECHO, HIGH);
```

```
  distanceCm = duration * SOUND_SPEED/2;
```

```
distanceInch = distanceCm * CM_TO_INCH;
```

```
Serial.print("Distance (cm): ");
```

```
Serial.println(distanceCm);
```

```
Serial.print("Distance (inch): ");
```

```
Serial.println(distanceInch);
```

```
delay(1000);
```

```
}
```

```
11)
```

```
#define IR 15
```

```
void setup() {
```

```
pinMode(IR,INPUT);
```

```
Serial.begin(9600);
```

```
}
```

```
void loop() {
```

```
int ir = digitalRead(IR);
```

```
if(ir == 1)
```

```
Serial.println("Object Not Detected");
```

```
else
```

```
Serial.println("Object Detected");
```

```
delay(1000);
```

```
}
```

12)

```
#include "DHT.h"

#define DHT11PIN 15

DHT dht(DHT11PIN, DHT11);

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

void loop()
{
  float humi = dht.readHumidity();
  float temp = dht.readTemperature();
  Serial.print("Temperature: ");
  Serial.print(temp);
  Serial.println(" C ");
  Serial.print("Humidity: ");
  Serial.println(humi);
  delay(1000);
}
```