

**Aim:** Interfacing of LED's & DC motor with 8051 microcontroller.

### **Blinking the LED**

ASM ORG 3000H

```
3000 : MOV 90H, #0FFH // instruction to turn ON the LED
      : LCALL 3030H    //Delay to keep LED ON
      : MOV 90H, #00   // instruction to turn OFF the LED
      : LCALL 3030H    //Delay to keep LED OFF
      : LJMP 3000H     //To repeat the program.
```

ASM ORG 3030H

```
3030 : MOV R0, #0FFH // Load register R0
3032 : MOV R1, #0FFH // Load register R1
3034 : DJNZ R1, 3034H //Decrement
3036 : DJNZ R0, 3032H
      : RET
```

### **Driving DC motor**

ASM ORG 3000H

```
3000 : MOV 90, #01    // instruction to turn ON the motor in clockwise
      : LCALL 3030    //Delay to keep motor running in clockwise
      : MOV 90, #00   // instruction to turn STOP the Motor
      : LCALL 3030    //Delay to keep Motor in STOP Position
      : MOV 90, #02   // instruction to turn ON the motor in anticlockwise
      : LCALL 3030    //Delay to keep motor running in anticlockwise
      : MOV 90, #00   // instruction to turn STOP the Motor
      : LCALL 3030    //Delay to keep Motor in STOP Position
      : LJMP 3000     //To repeat the program.
```

ASM ORG 3030

```
3030 : MOV R0, #0FF // Load register R0
3032 : MOV R1, #0FF // Load register R1
3034 : MOV R2, #0FF // Load register R2
3036 : DJNZ R2, 3036 //Decrement
3038 : DJNZ R1, 3034
303A : DJNZ R0, 3032
303C : RET
```

**Aim:** To develop a circuit for Blinking LED & Pulse Width Modulation (PWM) using Arduino.

### **Blinking LED**

```
void setup() {  
  pinMode(7,OUTPUT);  
  
}  
  
void loop() {  
  digitalWrite(7,HIGH);  
  delay(1000);  
  digitalWrite(7,LOW);  
  delay(1000);  
  
}
```

### **PWM**

```
void setup() {  
  pinMode(7,OUTPUT);  
  
}  
  
void loop() {  
  analogWrite(6,255);  
  delay(1000);  
  analogWrite(6,191);  
  delay(1000);  
  analogWrite(6,127);  
  delay(1000);  
  analogWrite(6,64);  
  delay(1000);  
  analogWrite(6,0);  
  delay(1000);  
}
```

**Aim:** Develop a circuit to interface Arduino with Temperature Sensor

## DHT11

```
#include <DHT.h>
DHT dht(2,DHT11);
int temp;
int hum;

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

void loop() {
  delay(2000);
  temp = dht.readTemperature();
  hum = dht.readHumidity();
  Serial.print("Temperature:");
  Serial.print(temp);
  Serial.println("oC"); //press Alt 167 for degree symbol
  Serial.print("Humidity:");
  Serial.print(hum);
  Serial.println("%");
}
```

**Aim:** Develop a circuit to interface Arduino with Ultrasonic Sensor

## **Ultrasonic Sensor**

```
const int trigPin = 10;
const int echoPin = 11;
int travelTime;
int distance;

void setup() {
  pinMode(trigPin,OUTPUT);
  pinMode(echoPin,INPUT);
  Serial.begin(9600);
}

void loop() {
  digitalWrite(trigPin,LOW);
  delay(100);
  digitalWrite(trigPin,HIGH);
  delay(500);
  digitalWrite(trigPin,LOW);
  travelTime = pulseIn(echoPin,HIGH);
  distance = 0.034*travelTime/2;
  Serial.println(distance);
}
```

**Aim:** Develop a circuit to interface Arduino with PIR Sensor

## PIR

```
int pirsensor = 2;
int readValue;

void setup() {
  pinMode(pirsensor,INPUT);
  pinMode(13,OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int readValue = digitalRead(pirsensor);
  if(readValue == 1)
  {
    digitalWrite(13,HIGH);
  }
  else
  {
    digitalWrite(13,LOW);
  }
  Serial.println(readValue);
}
```

**Aim:** Develop a circuit to interface Arduino with Actuator(12 V Solenoid Valve OR 12 V DC Motor).

### **Actuator**

```
int IRPin = 2;
int valvePin = 13;

void setup() {
  pinMode(IRPin, INPUT);
  pinMode(valvePin, OUTPUT);
}

void loop() {
  if(digitalRead(IRPin)== LOW)
  {
    digitalWrite(valvePin,HIGH);
  }
  else{
    digitalWrite(valvePin,LOW);
  }
}
```