1 Interfacing of LED

```
int LEDpin =4;
int buttonpin =7;
bool buttonsate =false;

void setup ()
{
  pinMode (LEDpin, OUTPUT);
  pinMode (buttonpin, INPUT);
}
 void loop ()
{
buttonsate =digitalRead (buttonpin);
if (buttonsate ==HIGH){
digitalWrite (LEDpin, HIGH);
}
else{
  digitalWrite (LEDpin,LOW);
 }
}
```

2.Analog Sensor Interfacing (Temp Sensor LMT35)

```
const int lm35_pin = A1;     /* LM35 O/P pin */


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


void loop() {
  int temp_adc_val;
  float temp_val;
  temp_adc_val = analogRead(lm35_pin);   /* Read Temperature
*/
  temp_val = (temp_adc_val * 4.88);   /* Convert adc value to
equivalent voltage */
  temp_val = (temp_val/10);    /* LM35 gives output of 10mv/°C
*/
  Serial.print("Temperature = ");
  Serial.print(temp_val);
  Serial.print(" Degree Celsius\n");
  delay(1000);
}
```

3.Interfacing Potentiometer for Position Control Simulation

```
#include <Servo.h>

Servo myServo;
int potpin = A0;
int potvalue = 0;
int angle = 0;
void setup() {
  myServo.attach(9);
  Serial.begin(9600);
}

void loop() {
  potvalue = analogRead(potpin);
  angle = map(potvalue, 0, 1023, 0, 180);
  myServo.write(angle);
  Serial.print("Potentiometer = ");
  Serial.print(potvalue);
  Serial.print(" | Servo angle = ");
  Serial.println(angle);

  delay(500);
}
```

4.Interfacing IR or Ultrasonic Sensor For Distance Measurement

```
int triggerpin = 3;
int echopin = 5;
long duration;
int distancecm;

void setup() {
  pinMode(triggerpin, OUTPUT);
  pinMode(echopin, INPUT);
  Serial.begin(9600);
}

void loop() {
  digitalWrite(triggerpin, LOW);
  delayMicroseconds(2);

  digitalWrite(triggerpin, HIGH);
  delayMicroseconds(10);
  digitalWrite(triggerpin, LOW);

  duration = pulseIn(echopin, HIGH);
  distancecm = duration * 0.034 / 2;
```

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

  delay(500);
}
```

5.Controlling DC Motor Using Transistor Driver Circuit

```
int motorpin = 6;
void setup() {
  pinMode(motorpin, OUTPUT);
}

void loop() {
  // Gradually increase motor speed
  for (int speed = 0; speed <= 255; speed++) {
    analogWrite(motorpin, speed);
    delay(50);
  }

  delay(1000);

  for (int speed = 255; speed >= 0; speed--) {
    analogWrite(motorpin, speed);
    delay(50);
  }

  delay(1000);
}
```

6.Data Logging Using Arduino And Excel (Serial Communication)

```
void setup(){
Serial.begin(9600);
Serial.println("CLEARDATA");
Serial.println("LABEL,Acolumn,Bcolumn,...");
Serial.println("RESETTIMER");
}
void loop(){
int sensorValue = analogRead(A0);
Serial.print("DATA,TIME,TIMER,");
Serial.println(sensorValue);
delay(1000);
}
```