

Group – 11

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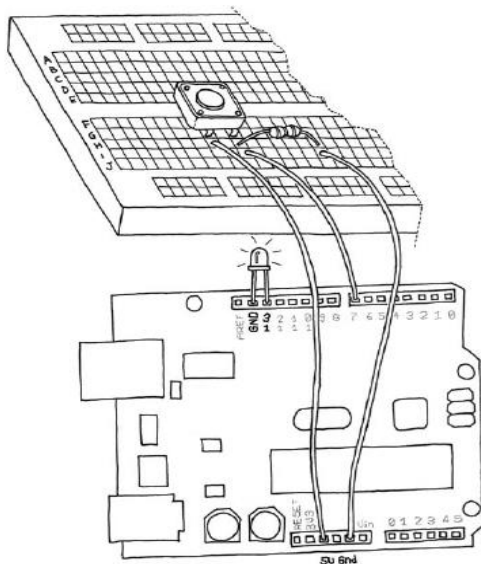
Experiment 2

Aim:

- Interfacing a push button switch
- Long Hold properties of switch using a capacitor
- Interfacing an LDR for Light Control
- Displaying light intensity on PC via serial monitor

Interfacing a Push Button Switch

Circuit Diagram and Code



```
PushButton

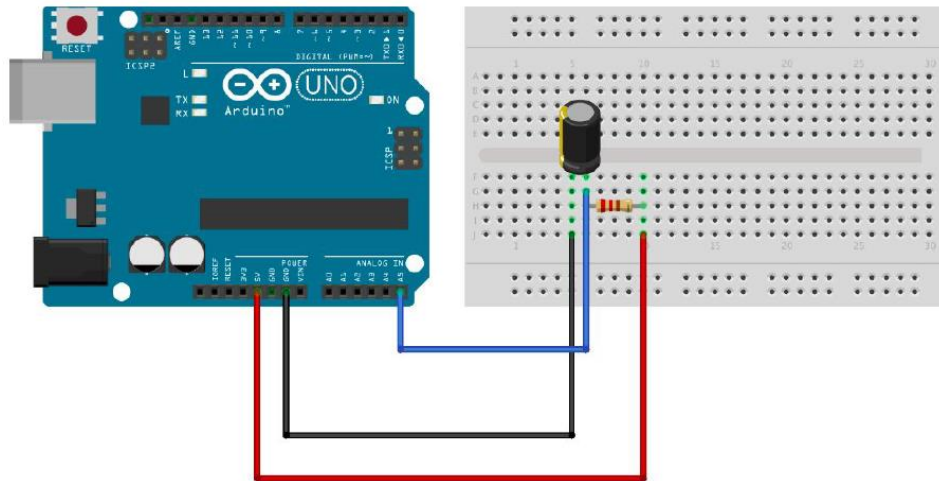
int ledPin = 13; // choose the pin for the LED
int inPin = 7;   // choose the input pin (for a pushbutton)
int val = 0;     // variable for reading the pin status

void setup() {
  pinMode(ledPin, OUTPUT); // declare LED as output
  pinMode(inPin, INPUT);   // declare pushbutton as input
}

void loop(){
  val = digitalRead(inPin); // read input value
  if (val == HIGH) {        // check if the input is HIGH (button released)
    digitalWrite(ledPin, HIGH); // turn LED OFF
  } else {
    digitalWrite(ledPin, LOW);  // turn LED ON
  }
}
```

Long Hold Properties of Switch using Capacitor

Circuit Diagram and Code



ResistorCapacitorSwitch

```
const int ledPin13 = 13;
float outputValue = 0.0;
const int analogInPin = A5;
int sensorValue = 0;

void setup() {

  pinMode(ledPin13, OUTPUT);
  Serial.begin(9600);

}
void loop(){

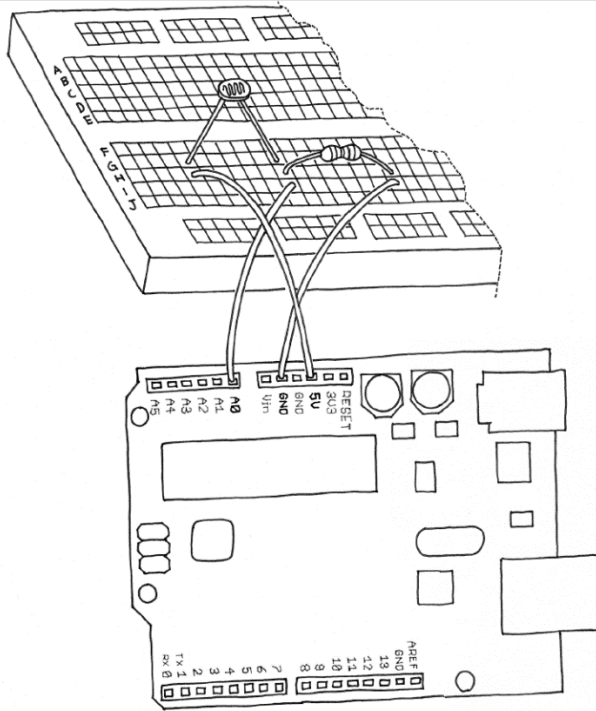
  sensorValue = analogRead(analogInPin);
  outputValue = sensorValue/1023.0;
  Serial.println(outputValue);
  if (outputValue >= 0.8) {

    digitalWrite(ledPin13, HIGH);
  }
  else{

    digitalWrite(ledPin13, LOW);
  }
  delay(100);
}
```

Interfacing an LDR for light control and displaying light intensity on Serial Monitor

Circuit Diagram and Code



LDR

```
const int LED = 9;
int val = 0;

void setup() {
  pinMode(LED, OUTPUT);
  // put your setup code here, to run once:
  Serial.begin(9600);
}

void loop() {
  val = analogRead(0);
  analogWrite(LED, val/2);
  Serial.println(val);
  delay(100);
  // put your main code here, to run repeatedly:
}
```

Discussions

1. In the capacitor switching circuit, how fast the capacitor voltage reaches the threshold voltage depends on the time constant (RC) of the RC circuit. Lower the time constant, faster the charging and discharging and faster will the bulb glow and go off. When the pushbutton is pressed, the charging path is complete and the capacitor builds up voltage. Once it goes above a certain threshold (here 80%), the led PIN receives a digital signal from the Arduino which turns it ON. When the push button is released, the capacitor discharges through R_2 . This discharge was quite fast and the LED was turned off as soon as the voltage fell below 80%. The capacitor voltage was displayed in the Serial Monitor after appropriate scaling of the analogue value.

2. In the LDR experiment, we observed that the voltage changed when we put light on it (cell phone flashlight) and when we removed the light source. The resistance of LDR increases in absence of light and decreases in presence of light. No light will increase its resistance value.