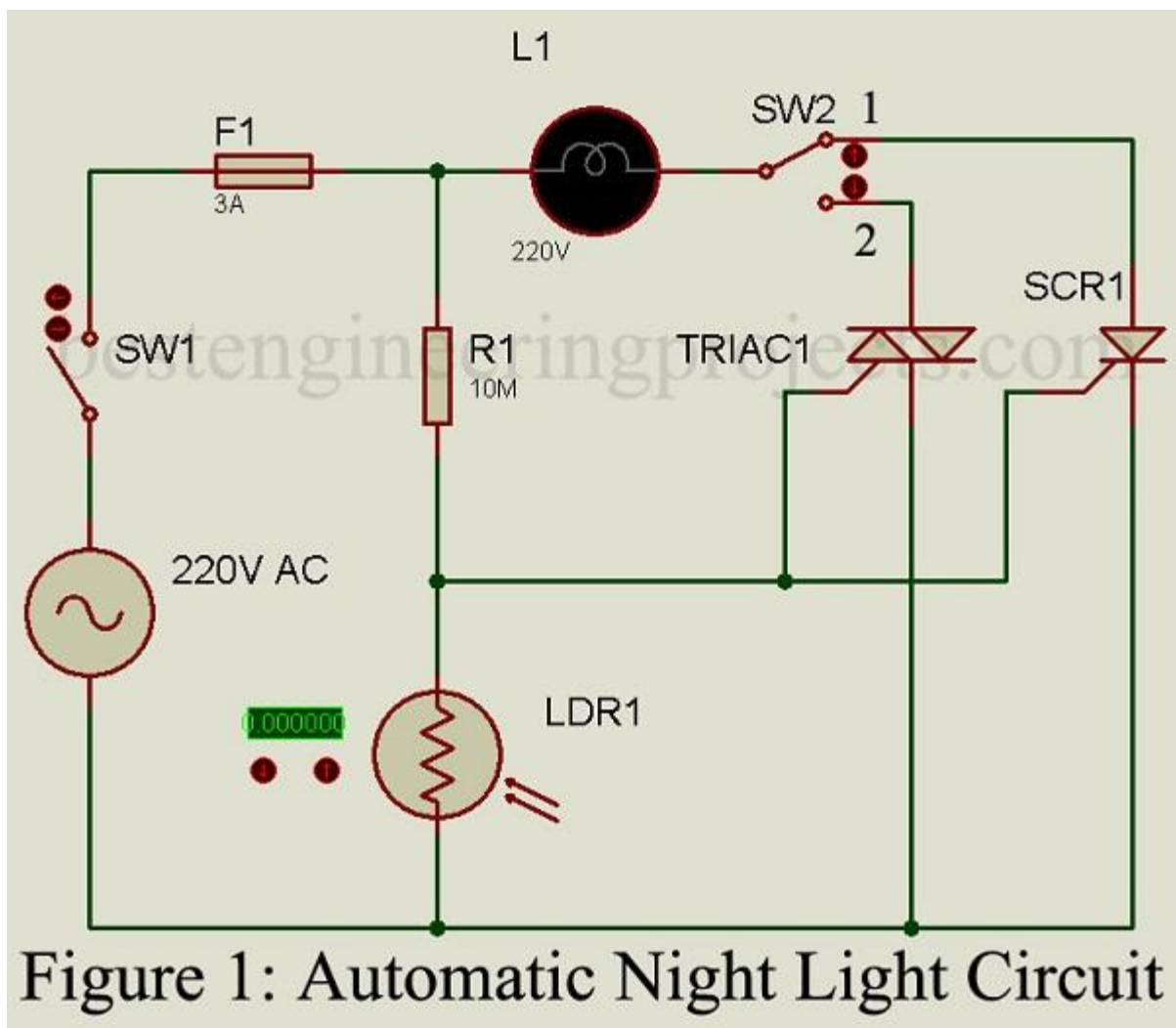# Circuit:

Figure 1: Automatic Night Light Circuit

Theory:

SCR (Silicon Controlled Rectifier) is a PNPN silicon device with end p-terminal forming the anode A, end n-terminal forming the cathode k and a gate, called the cathode gate Ge, at the p-layer next to the cathode. SCR has two stable state namely ON state and OFF states. No intermediate state is possible. Thus, with the suitable forward voltage and gate current, SCR switches to ON state and draws heavy current limited only by the resistor in the external circuit.It remains in the ON state indefinitely. Only the SCR fires i.e. comes in the ON state, gate loses all control. SCR can be turned OFF by reducing the supply voltage below the holding voltage V_H i.e. reducing the device current below the holding current I_H. This function of SCR is similar to that of a mechanical switch and hence SCR truly forms an electronic switch.

Observation:

At day time when an adequate amount of light fall on the LDR its resistance is very low. Let the switch SW_2 is in position 1 (i.e. connected to SCR) and switch SW_1 is closed. AC input voltage is rises to 330 volts. The voltage is divided into two voltages because resistor R_1 and LDR are connected in series. At day time, the peak voltage is less than breakdown voltage the SCR will remains off. When light on LDR become low the resistance of LDR become high as a result SCR gate is triggered and lap start to glow. We know that SCR is only operated in positive half cycle as a result the intensity of bulb will reduce but it will boost the lifespan of bulb.

Precaution:

In order to reduce this limitation a TRIAC is used for this switch SW_2 is move to position 2. The brightness of lamp will distinct increases.

Code:

#define r1 0

#define g1 1

#define b1 2

#define r2 3

#define g2 4

#define b2 5

#define r3 6

#define g3 7

#define b3 8

#define r4 9

```
#define g4 10

#define b4 11


void red()

{

 digitalWrite(r1,HIGH);

 digitalWrite(r2,HIGH);

 digitalWrite(r3,HIGH);

 digitalWrite(r4,HIGH);


 digitalWrite(g1,LOW);

 digitalWrite(g2,LOW);

 digitalWrite(g3,LOW);

 digitalWrite(g4,LOW);


 digitalWrite(b1,LOW);

 digitalWrite(b2,LOW);

 digitalWrite(b3,LOW);

 digitalWrite(b4,LOW);

}


void green()

{

 digitalWrite(r1,LOW);

 digitalWrite(r2,LOW);
```

```
      digitalWrite(r3,LOW);

      digitalWrite(r4,LOW);


      digitalWrite(g1,HIGH);

      digitalWrite(g2,HIGH);

      digitalWrite(g3,HIGH);

      digitalWrite(g4,HIGH);


      digitalWrite(b1,LOW);

      digitalWrite(b2,LOW);

      digitalWrite(b3,LOW);

      digitalWrite(b4,LOW);
}

void blue()
{
   digitalWrite(r1,LOW);

   digitalWrite(r2,LOW);

   digitalWrite(r3,LOW);

   digitalWrite(r4,LOW);


   digitalWrite(g1,LOW);

   digitalWrite(g2,LOW);

   digitalWrite(g3,LOW);

   digitalWrite(g4,LOW);
```

```
  digitalWrite(b1,HIGH);

  digitalWrite(b2,HIGH);

  digitalWrite(b3,HIGH);

  digitalWrite(b4,HIGH);

}


void yellow()

{

  digitalWrite(r1,HIGH);

  digitalWrite(r2,HIGH);

  digitalWrite(r3,HIGH);

  digitalWrite(r4,HIGH);


  digitalWrite(g1,HIGH);

  digitalWrite(g2,HIGH);

  digitalWrite(g3,HIGH);

  digitalWrite(g4,HIGH);


  digitalWrite(b1,LOW);

  digitalWrite(b2,LOW);

  digitalWrite(b3,LOW);

  digitalWrite(b4,LOW);

}
```

```
void cyan()
{
  digitalWrite(r1,LOW);

  digitalWrite(r2,LOW);

  digitalWrite(r3,LOW);

  digitalWrite(r4,LOW);


  digitalWrite(g1,HIGH);

  digitalWrite(g2,HIGH);

  digitalWrite(g3,HIGH);

  digitalWrite(g4,HIGH);


  digitalWrite(b1,HIGH);

  digitalWrite(b2,HIGH);

  digitalWrite(b3,HIGH);

  digitalWrite(b4,HIGH);
}

void magnetica()
{
  digitalWrite(r1,HIGH);

  digitalWrite(r2,HIGH);

  digitalWrite(r3,HIGH);

  digitalWrite(r4,HIGH);
```

```
  digitalWrite(g1,LOW);

  digitalWrite(g2,LOW);

  digitalWrite(g3,LOW);

  digitalWrite(g4,LOW);


  digitalWrite(b1,HIGH);

  digitalWrite(b2,HIGH);

  digitalWrite(b3,HIGH);

  digitalWrite(b4,HIGH);
}

void white()
{
  digitalWrite(r1,HIGH);

  digitalWrite(r2,HIGH);

  digitalWrite(r3,HIGH);

  digitalWrite(r4,HIGH);


  digitalWrite(g1,HIGH);

  digitalWrite(g2,HIGH);

  digitalWrite(g3,HIGH);

  digitalWrite(g4,HIGH);


  digitalWrite(b1,HIGH);

  digitalWrite(b2,HIGH);
```

```arduino
  digitalWrite(b3,HIGH);

  digitalWrite(b4,HIGH);

}


void setup() {

  // put your setup code here, to run once:

 pinMode(0,OUTPUT);

 pinMode(1,OUTPUT);

 pinMode(2,OUTPUT);

 pinMode(3,OUTPUT);

 pinMode(4,OUTPUT);

 pinMode(5,OUTPUT);

 pinMode(6,OUTPUT);

 pinMode(7,OUTPUT);

 pinMode(8,OUTPUT);

 pinMode(9,OUTPUT);

 pinMode(10,OUTPUT);

 pinMode(11,OUTPUT);

 pinMode(12,OUTPUT);


}


void loop() {

 red();

 delay(1000);
```

```
green();

delay(1000);

blue();

delay(1000);

yellow();

delay(1000);

cyan();

delay(1000);

magnetica();

delay(1000);

white();

delay(1000);

}
```