Luminite de Craciun Tinkercad Arduino
Proiect Achiziții de Date

Gîrlea Anana Catalina 323CA

Universitatea Politehnica Bucuresti
Facultatea de Automatică si Calculatoare specializarea Calculatoare si tehnologia informatiei
anana.girlea@stud.isb.upb.ro

Abstract. Luminite de Craciun cu 5 jocuri de culori posibile care se aprind cand este intuneric afara folosind o placuta Arduino.

Keywords: Arduino, LCD, Breadboard, LED, photoresistor

1 Descrierea problemei

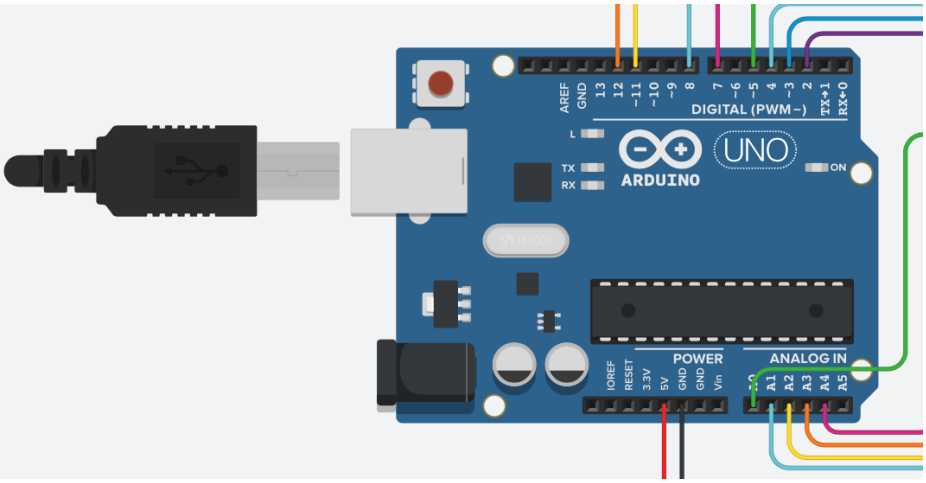
In cadrul acestui proiect am implementat luminite de craciun care se aprind in momentul in care este intuneric. Luminitele au mai multe jocuri de culori care sunt activate cu ajutorul unui DIP switch SPST x4, precum si un mod default.

Pentru implementare am folosit aplicatia Tinkercad.

2 Componentele Circuitului

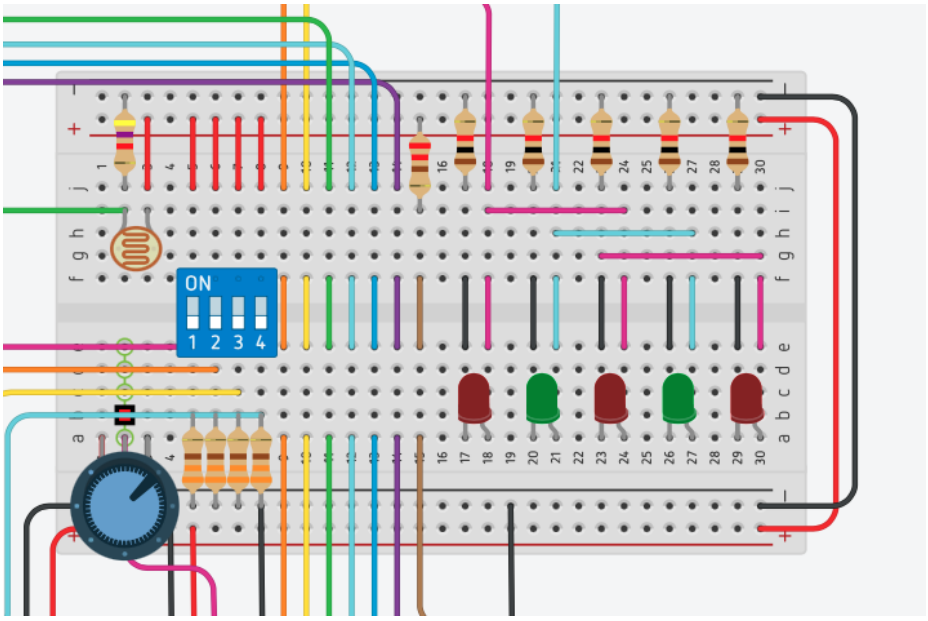
2.1 Placuta Arduino

Acesata este componenta care alimenteaza cu curent breadboad-ul si la care se conecteaza toate celelalte componente.



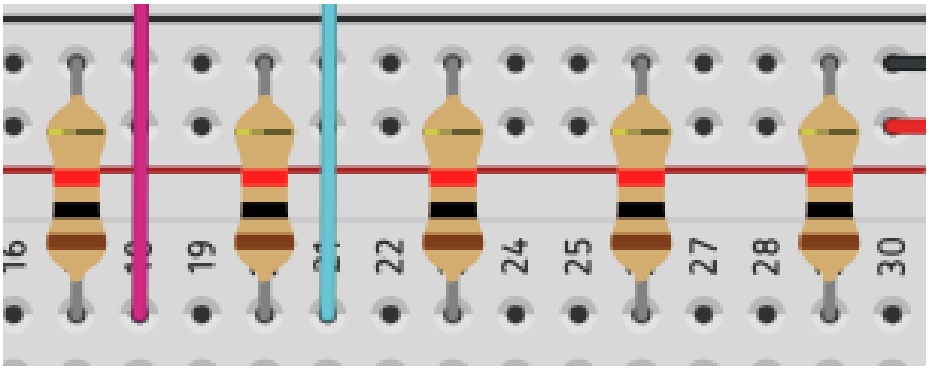
2.2 Breadboard

Placa usureaza conectarea componentelor circuitului si face ca legaturile sa fie mai usor vizibile la ochiul liber.



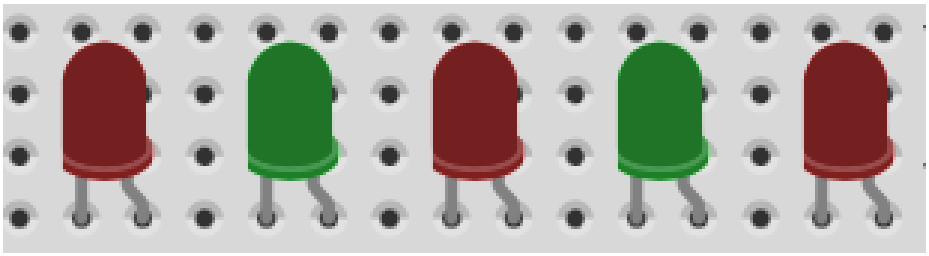
2.3 Rezistente

Rezistentele sunt folosite pentru a proteja componentele circuitului impotriva tensiunii ridicate.



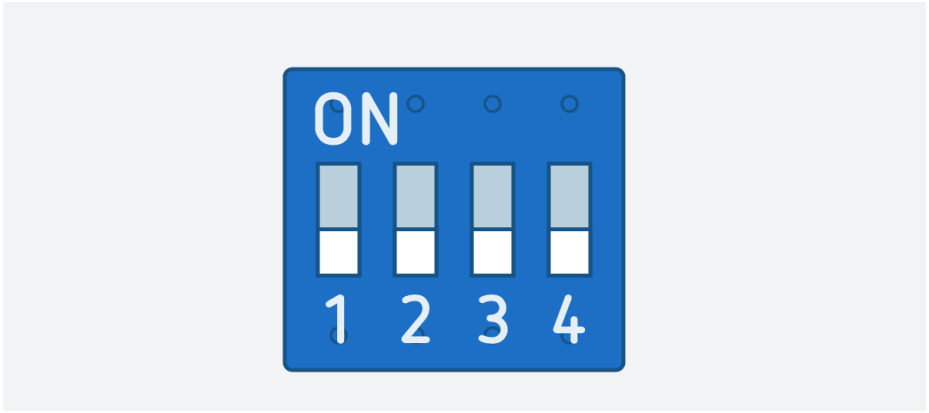
2.4 LED

Se aprind in functie de prezenta / lipsa luminii si de jocul selectat.



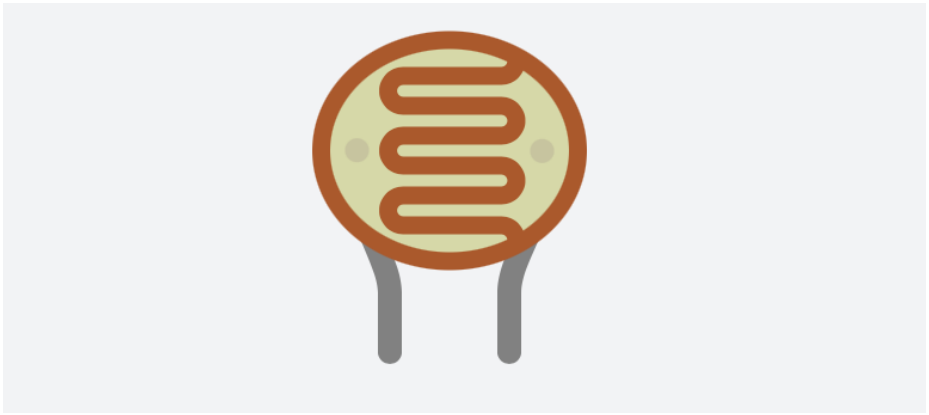
2.5 DIP switch SPST x4

Face selectia jocului de lumini.



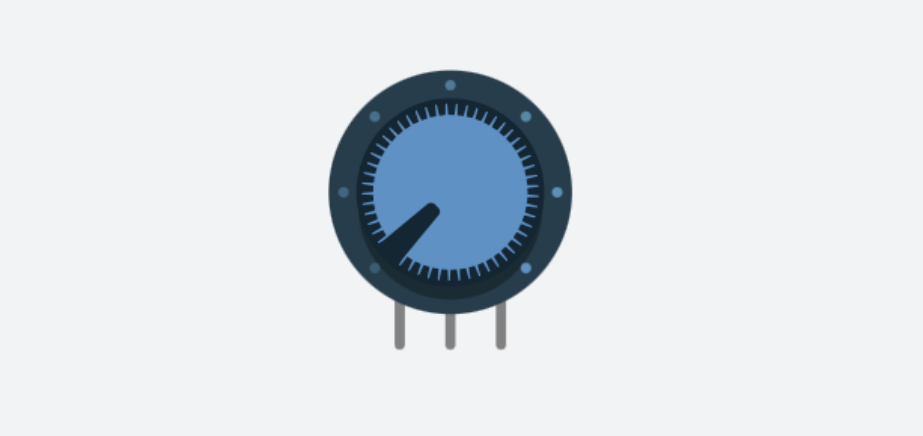
2.6 Photoresistor

Senzorul este folosit pentru detectarea nivelului de luminozitate.



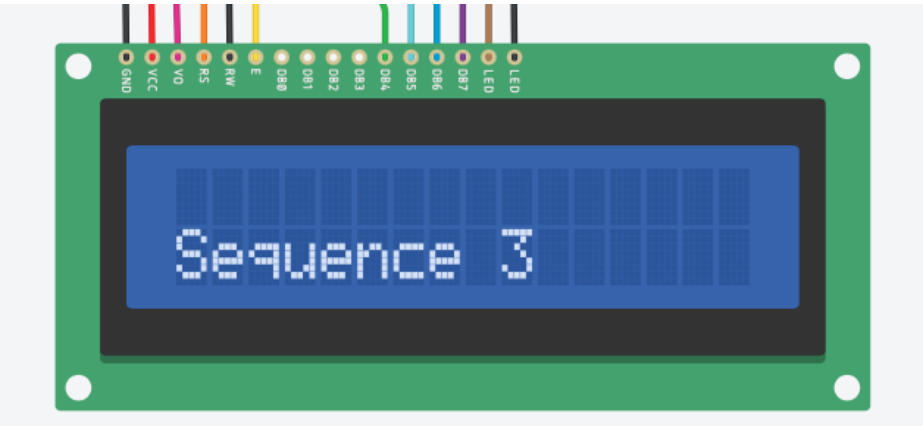
2.7 Potentiometru

Regleaza tensiunea pentru ecranul LCD.



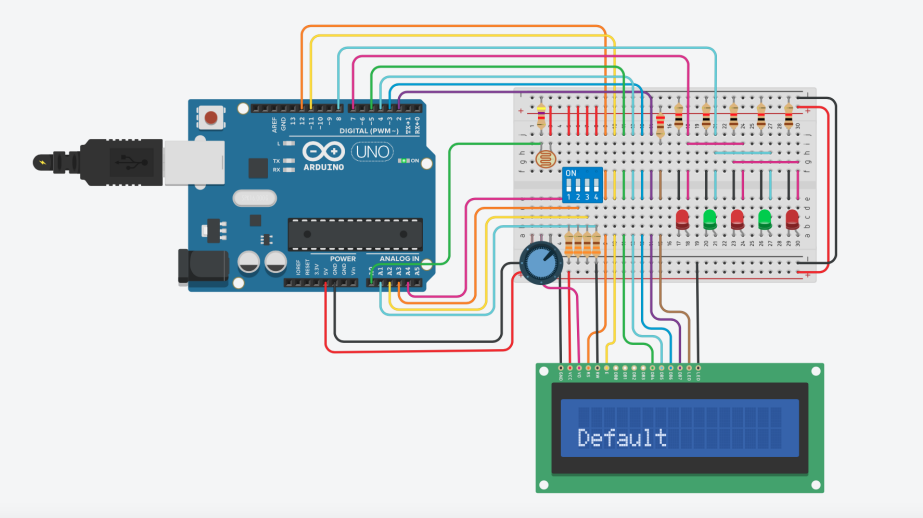
2.8 Display LCD

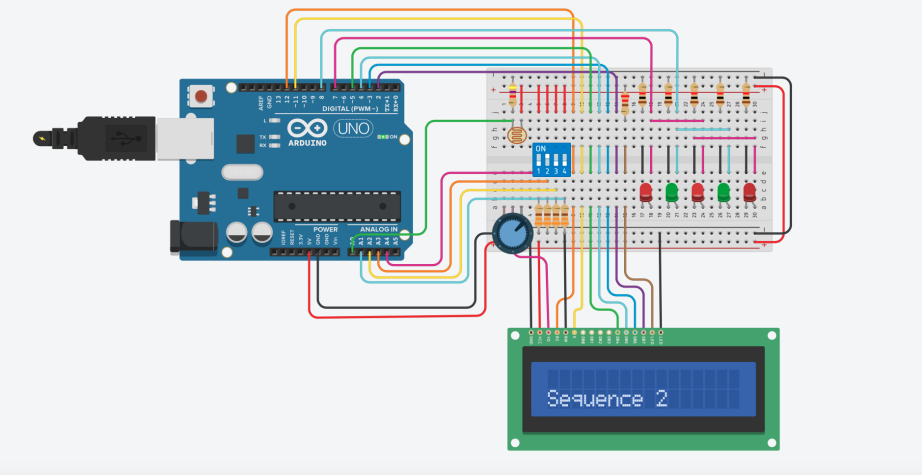
Ecranul este folosit pentru a afisa pe care dintre cele 5 jocuri de culori ne aflam.



3 Cum functioneaza

Senzorul primeste date de intrate. Daca se afla la lumina, sistemul de lumini este inactiv. Daca se afla la intuneric, jocul de lumini la incepe. Sistemul are 5 jocuri posibile: "Default", "Sequence 1", "Sequence 2", "Sequence 3" si "Sequence 4". Pe ecran va fi afisata optinua selectata si jocul de lunimi respectiv va porni. Codul a fost scris in C++.





4 Codul in C++:

```
#include <LiquidCrystal.h>

LiquidCrystal lcd_1(12, 11, 5, 4, 3, 2);

int sensorValue = 0;

void setup()
{
  lcd_1.begin(10, 10);
```

```
  pinMode(A0, INPUT);
  pinMode(A1, INPUT);
  pinMode(A2, INPUT);
  pinMode(A3, INPUT);
  pinMode(A4, INPUT);
  Serial.begin(9600);

  pinMode(7, OUTPUT);
  pinMode(8, OUTPUT);
}

void loop()
{
  sensorValue = 923 - analogRead(A0);
  Serial.println(sensorValue);

  lcd_1.setCursor(0, 1);

    if(digitalRead(A4) == HIGH) {
       lcd_1.setCursor(0, 1);
       lcd_1.print("Sequence 1");

       analogWrite(8, map(sensorValue, 0, 1023, 0, 255));
       digitalWrite(7, LOW);
       delay(1000);
       digitalWrite(8, LOW);
       digitalWrite(7, LOW);
       delay(1000);
       analogWrite(8, map(sensorValue, 0, 1023, 0, 255));
       digitalWrite(7, LOW);
       delay(1000);

       digitalWrite(8, LOW);
       analogWrite(7, map(sensorValue, 0, 1023, 0, 255));
       delay(1000);
       digitalWrite(8, LOW);
       digitalWrite(7, LOW);
       delay(1000);
       digitalWrite(8, LOW);
       analogWrite(7, map(sensorValue, 0, 1023, 0, 255));
       delay(1000);
    }

    if(digitalRead(A3) == HIGH){
```

```
      lcd_1.setCursor(0, 1);
      lcd_1.print("Sequence 2");

       analogWrite(8, map(sensorValue, 0, 1023, 0, 255));
           digitalWrite(7, LOW);
           delay(1000);
           digitalWrite(8, LOW);
           analogWrite(7, map(sensorValue, 0, 1023, 0, 255));
           delay(1000);
     }

    if(digitalRead(A2) == HIGH){
      lcd_1.setCursor(0, 1);
      lcd_1.print("Sequence 3");

      analogWrite(8, map(sensorValue, 0, 1023, 0, 255));
      digitalWrite(7, LOW);
      delay(300);
      digitalWrite(8, LOW);
      analogWrite(7, map(sensorValue, 0, 1023, 0, 255));
      delay(300);
    }

    if(digitalRead(A1) == HIGH){
      lcd_1.setCursor(0, 1);
      lcd_1.print("Sequence 4");

      analogWrite(8, map(sensorValue, 0, 1023, 0, 255));
      analogWrite(7, map(sensorValue, 0, 1023, 0, 255));
      delay(300);
      digitalWrite(8, LOW);
      digitalWrite(7, LOW);
      delay(300);
      analogWrite(8, map(sensorValue, 0, 1023, 0, 255));
      analogWrite(7, map(sensorValue, 0, 1023, 0, 255));
      delay(300);
  }
     else {
      lcd_1.setCursor(0, 1);
      lcd_1.print("Default    ");

      analogWrite(8, map(sensorValue, 0, 1023, 0, 255));
      analogWrite(7, map(sensorValue, 0, 1023, 0, 255));
  }
}
```

Linkul catre proiect este:
https://www.tinkercad.com/things/8jSPkWktQHN?sharecode=DFwjnFRbhz4lOsz4EOwKYYEYDGDfuSoYl

5 References

How To Use Lcd In Tinkercad, https://www.tutocad.com/tinkercad/how-to-use-lcd-in-tinkercad/
Light Sensor (Photoresistor) With Arduino in Tinkercad, https://www.instructables.com/Light-Sensor-Photoresistor-Arduino-Tinkercad/