ПМГ „Акад. Боян Петканчин“ – гр. Хасково

НП “Обучение за ИТ кариера“

Модул 8

Миночистач / Minesweeper

Документация

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https://github.com/annie-prog

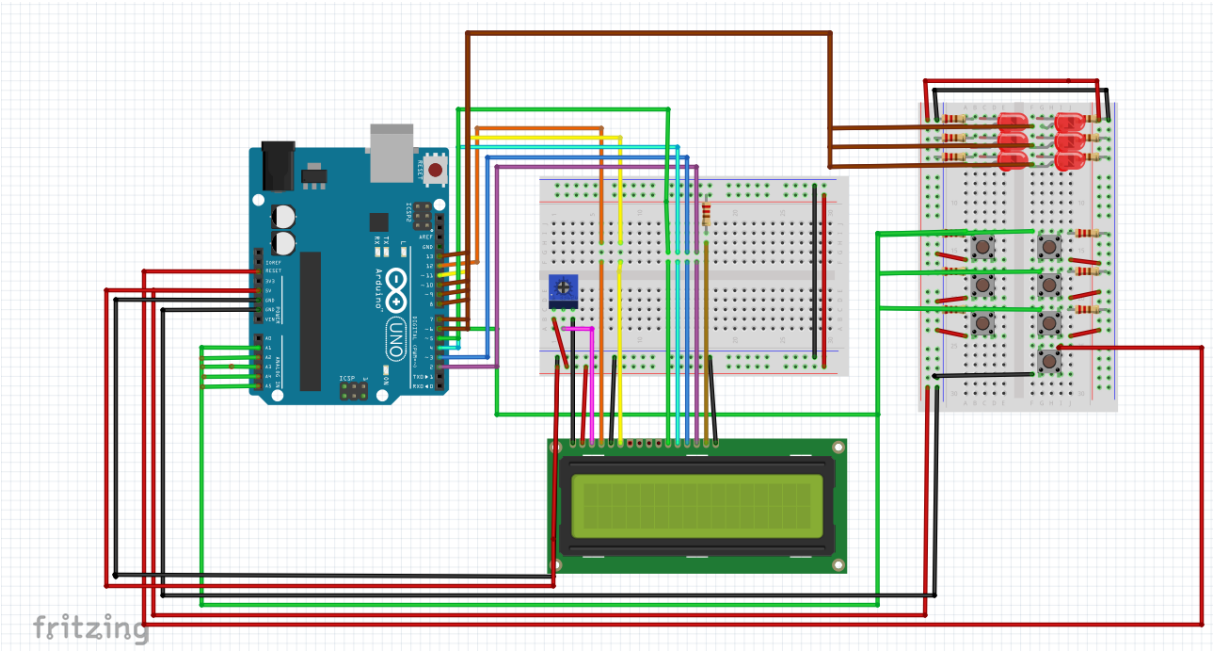
Съдържание

Кратко представяне

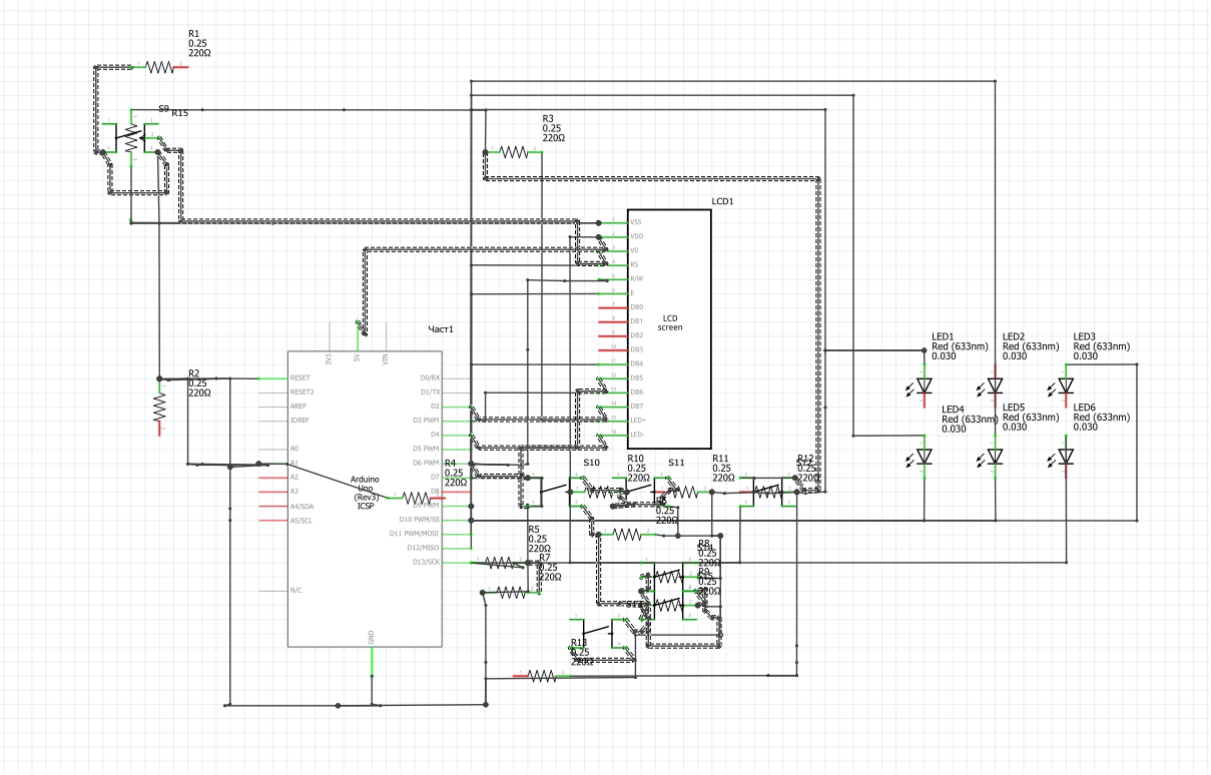
Проектът представлява вариация на играта "Миночистач"

- пъзел за един играч. Целта ѝ
е да се изчисти правоъгълна дъска, съдържаща скрити мини, без да детонира нито една от тях,
с помощта на улики за броя на съседните мини във всяко поле.

Блокова схема



Електрическа схема



Списък от съставни части

- Arduino Uno R3 – 1
- LED – 6
- Pushbutton – 7
- LCD 16X2 – 1
- Breadbord small – 2
- 1 kΩ Resistor – 12
- 220 Ω Resistor – 1
- 250 kΩ Potentiometer - 1

Сорс код

#include <LiquidCrystal.h> //include the library code:

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);// initializes the library with the numbers of the interface pins

```
int count; //initializes the count of mines around a button

// mines
int mine1;
int mine2;

//current buttons
int cbutton1;
int cbutton2;
int cbutton3;
int cbutton4;
int cbutton5;
int cbutton6;

// previous buttons
int pbutton1;
int pbutton2;
int pbutton3;
int pbutton4;
int pbutton5;
int pbutton6;

void setup()
{
  lcd.begin(16, 2); // set up the LCD's number of columns and rows:
  Serial.begin(9600);// set up the project.
```

```
randomSeed(analogRead(A0));
while(mine1 == mine2)
{
  // making sure the mines are different
  mine1 = random(6, 11);
  mine2 = random(6, 11);
}
 //Comment in the debugging
Serial.println(mine1);
Serial.println(mine2);

lcd.setCursor(0,0);
lcd.print("Starting game...");
for(int i=6; i<=10; i++) // set up the led lamps
{
  pinMode(i, OUTPUT);
}
pinMode(13, OUTPUT);

for(int i = 1; i<=3; i++)// the  game starts in 3..2..1
{
digitalWrite(6, HIGH);
digitalWrite(7, HIGH);
digitalWrite(8, HIGH);
digitalWrite(9, HIGH);
```

```
  digitalWrite(10, HIGH);
  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(6, LOW);
  digitalWrite(7, LOW);
  digitalWrite(8, LOW);
  digitalWrite(9, LOW);
  digitalWrite(10, LOW);
  digitalWrite(13, LOW);
  delay(500);
  }
}

void blink(int pin, int mine) //led lamps have to blink when there is a mine near the button
{
  for(int i = 1; i <= mine; i++)
  {
    digitalWrite(pin, HIGH);
    delay(200);
    digitalWrite(pin, LOW);
    delay(200);
  }
}

void lose(int button)//when we choose a mine, the game is over
{
```

```
  if(button == mine1 || button == mine2)
  {
    lcd.clear();
    lcd.setCursor(0,0); // set the cursor to column 0, line 0
    lcd.print("Game over!"); //print 'game over'
    for(int i=6; i<=10; i++)
    {
      //all lamps are shining
      digitalWrite(i, HIGH);
      digitalWrite(13, HIGH);
      delay(100);
      //all lamps are not shining
      digitalWrite(i, LOW);
      digitalWrite(13, LOW);
    }
    delay(1000);
    //the mines are shining
    digitalWrite(mine1, HIGH);
    digitalWrite(mine2, HIGH);
    delay(1000);
    //the mines are not shining anymore
    digitalWrite(mine1, LOW);
    digitalWrite(mine2, LOW);
  }
}
```

```
void loop()
{
  lcd.setCursor(0, 1); // set the cursor to column 0, line 1
  //initialize all buttons
  cbutton1 = digitalRead(6);
  cbutton2 = digitalRead(A1);
  cbutton3 = digitalRead(A2);
  cbutton4 = digitalRead(A3);
  cbutton5 = digitalRead(A4);
  cbutton6 = digitalRead(A5);

  if(cbutton1 == HIGH && 6 != mine1 && 6 != mine2)
  {
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("It's not a mine");
  }
  if(cbutton2 == HIGH && 7 != mine1 && 7 != mine2)
  {
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("It's not a mine");
  }
  if(cbutton3 == HIGH && 8 != mine1 && 8 != mine2)
  {
    lcd.clear();
```

```
  lcd.setCursor(0,0);
  lcd.print("It's not a mine");
}
if(cbutton4 == HIGH && 9 != mine1 && 9 != mine2)
{
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("It's not a mine");
}
if(cbutton5 == HIGH && 10 != mine1 && 10 != mine2)
{
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("It's not a mine");
}
if(cbutton6 == HIGH && 13 != mine1 && 13 != mine2)
{
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("It's not a mine");
}

// count the number of mines around a button
count = 0;
if(cbutton1 == HIGH && cbutton1 != pbutton1)
{
```

```
  lose(6);

  if(7 == mine1 || 7 == mine2)
  {
    count += 1;
  }
  if(8 == mine1 || 8 == mine2)
  {
    count += 1;
  }
  if(9 == mine1 || 9 == mine2)
  {
    count += 1;
  }

  if(6 != mine1 && 6 != mine2)
  {
    lcd.setCursor(0,1);
    lcd.print(count);
    blink(6, count);
  }
}
else if(cbutton2 == HIGH && cbutton2 != pbutton2)
{
  lose(7);
```

```
  if(6 == mine1 || 6 == mine2)
  {
    count += 1;
  }
   if(8 == mine1 || 8 == mine2)
  {
    count += 1;
  }
   if(9 == mine1 || 9 == mine2)
  {
    count += 1;
  }
  if(7 != mine1 && 7 != mine2)
  {
    lcd.setCursor(0,1);
    lcd.print(count);
    blink(7, count);
  }
}
else if(cbutton3 == HIGH && cbutton3 != pbutton3)
{
  lose(8);

  if(6 == mine1 || 6 == mine2)
  {
    count += 1;
```

```
  }
  if(7 == mine1 || 7 == mine2)
  {
    count += 1;
  }
  if(9 == mine1 || 9 == mine2)
  {
    count += 1;
  }
  if(10 == mine1 || 10 == mine2)
  {
    count += 1;
  }
  if(13 == mine1 || 13 == mine2)
  {
    count += 1;
  }

  if(8 != mine1 && 8 != mine2)
  {
    lcd.setCursor(0,1);
    lcd.print(count);
    blink(8, count);
  }
}
else if(cbutton4 == HIGH && cbutton4 != pbutton4)
```

```
{
  lose(9);

  if(6 == mine1 || 6 == mine2)
  {
    count += 1;
  }
  if(7 == mine1 || 7 == mine2)
  {
    count += 1;
  }
  if(8 == mine1 || 8 == mine2)
  {
    count += 1;
  }
  if(10 == mine1 || 10 == mine2)
  {
    count += 1;
  }
  if(13 == mine1 || 13 == mine2)
  {
    count += 1;
  }
  if(9 != mine1 && 9 != mine2)
  {
    lcd.setCursor(0,1);
```

```
    lcd.print(count);
    blink(9, count);
  }
}
else if(cbutton5 == HIGH && cbutton5 != pbutton5)
{
  lose(10);

  if(8 == mine1 || 8 == mine2)
  {
    count += 1;
  }
  if(9 == mine1 || 9 == mine2)
  {
    count += 1;
  }
  if(13 == mine1 || 13 == mine2)
  {
    count += 1;
  }
  if(10 != mine1 && 10 != mine2)
  {
    lcd.setCursor(0,1);
    lcd.print(count);
    blink(10, count);
  }
```

```
}
else if(cbutton6 == HIGH && cbutton6 != pbutton6)
{
  lose(13);

  if(8 == mine1 || 8 == mine2)
  {
    count += 1;
  }
  if(9 == mine1 || 9 == mine2)
  {
    count += 1;
  }
  if(10 == mine1 || 10 == mine2)
  {
    count += 1;
  }
  if(13 != mine1 && 13 != mine2)
  {
    lcd.setCursor(0,1);
    lcd.print(count);
    blink(13, count);
  }
}
//replace new buttons with the old ones, so that the lamps won't light forever
pbutton1 = cbutton1;
```

```
  pbutton2 = cbutton2;
  pbutton3 = cbutton3;
  pbutton4 = cbutton4;
  pbutton5 = cbutton5;
  pbutton6 = cbutton6;
}
```

Заключение

Играта Миночистач се използва основно за забавление, като тя развива логическото мислене на хората.