

# Sat za šah

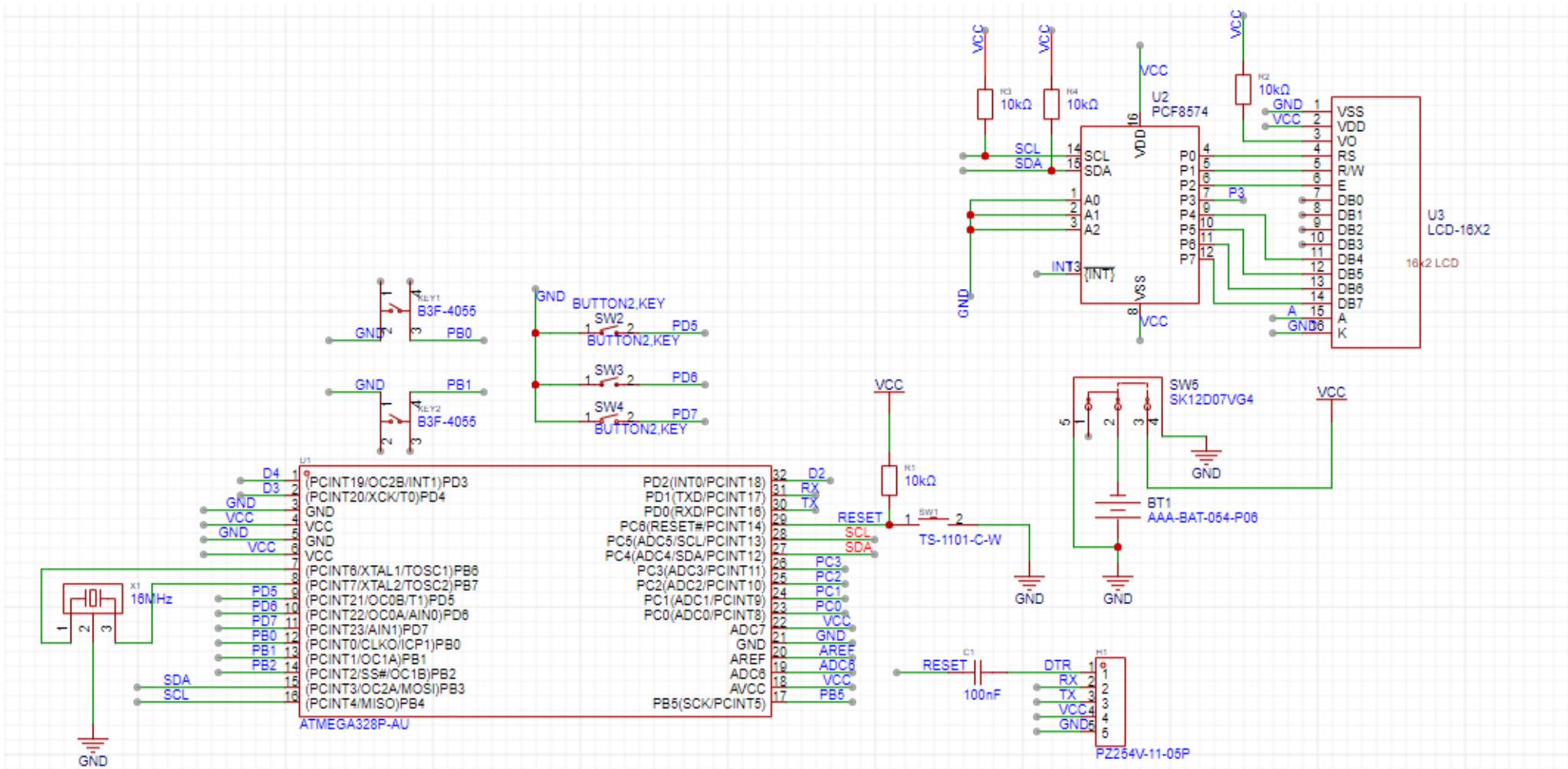
TRRS – projektni zadatak

Stefan Belić

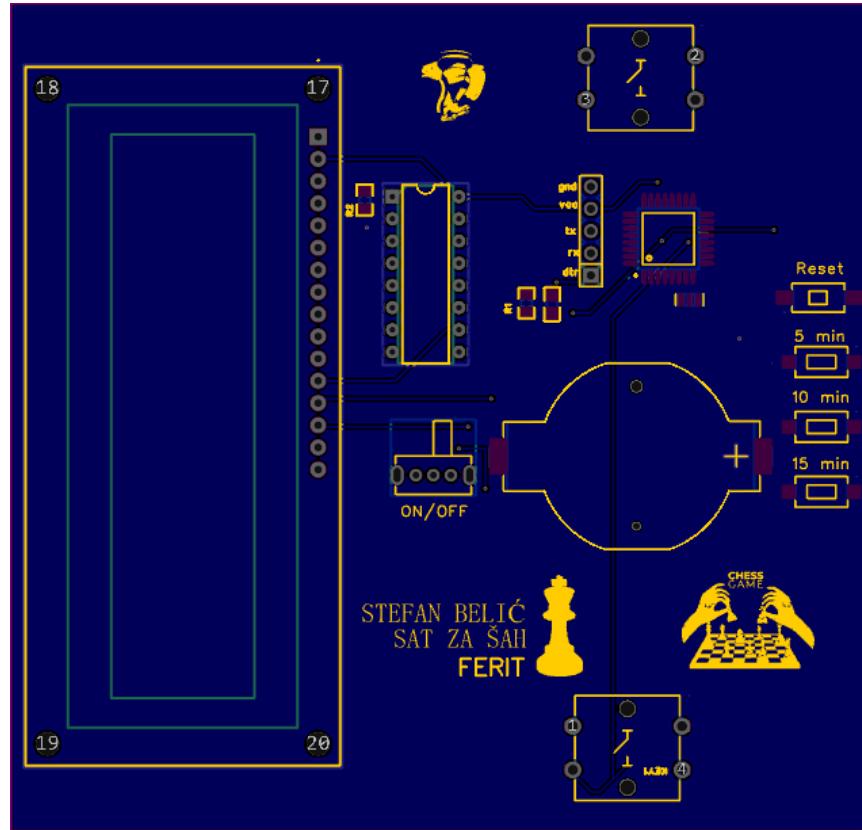
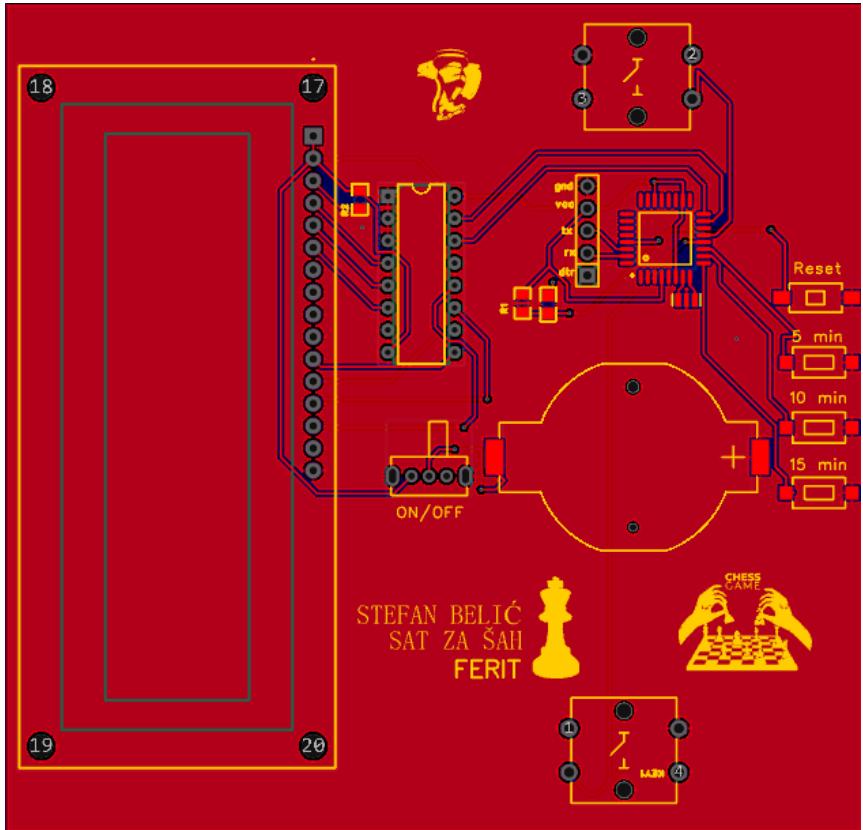
# Sadržaj

- Elektronička shema
- PCB layout
- 3D model
- Prazna pločica
- Gotov model
- Program
- Zaključak

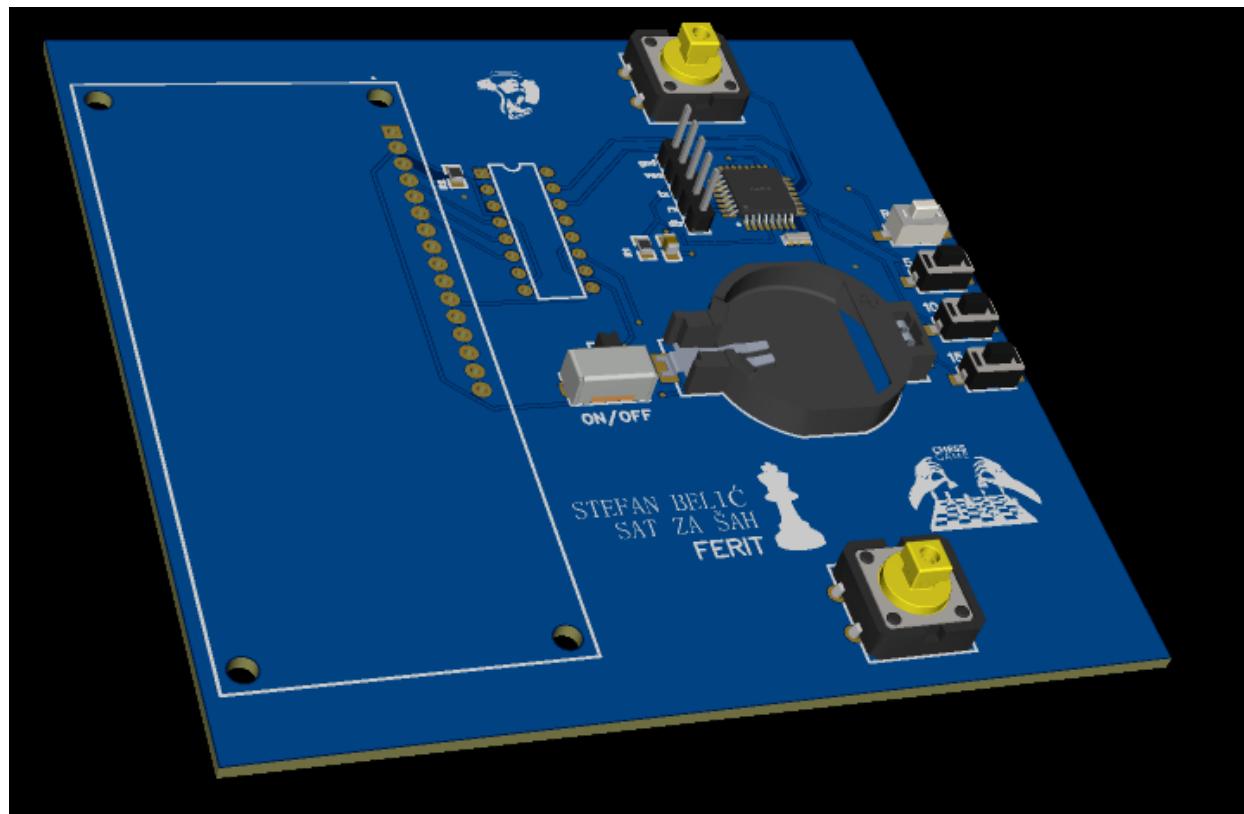
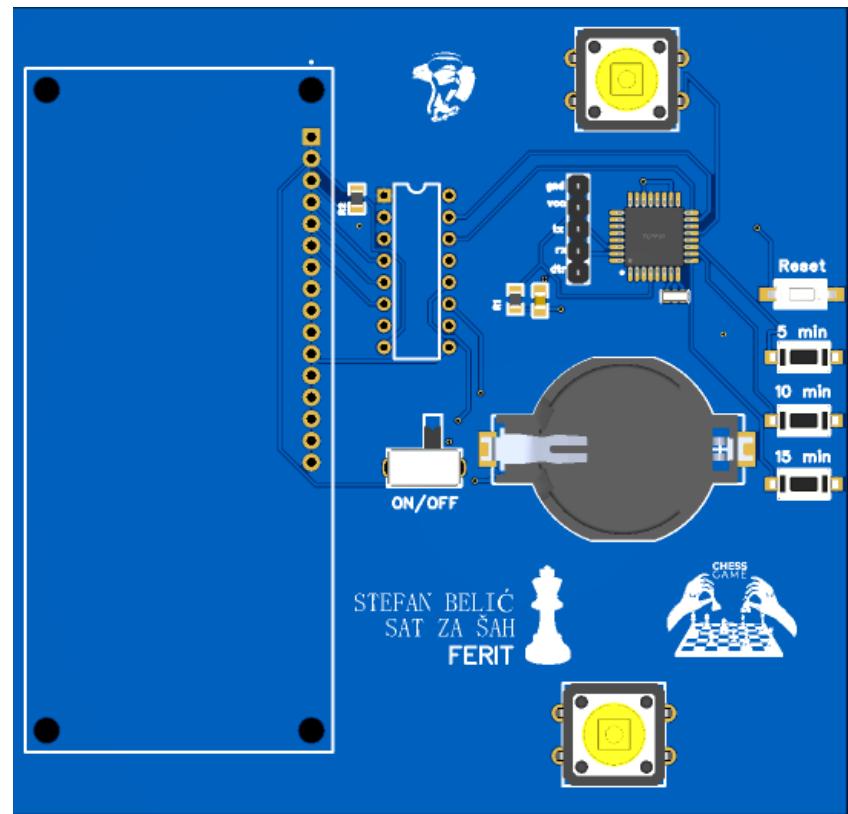
# Elektronická shema



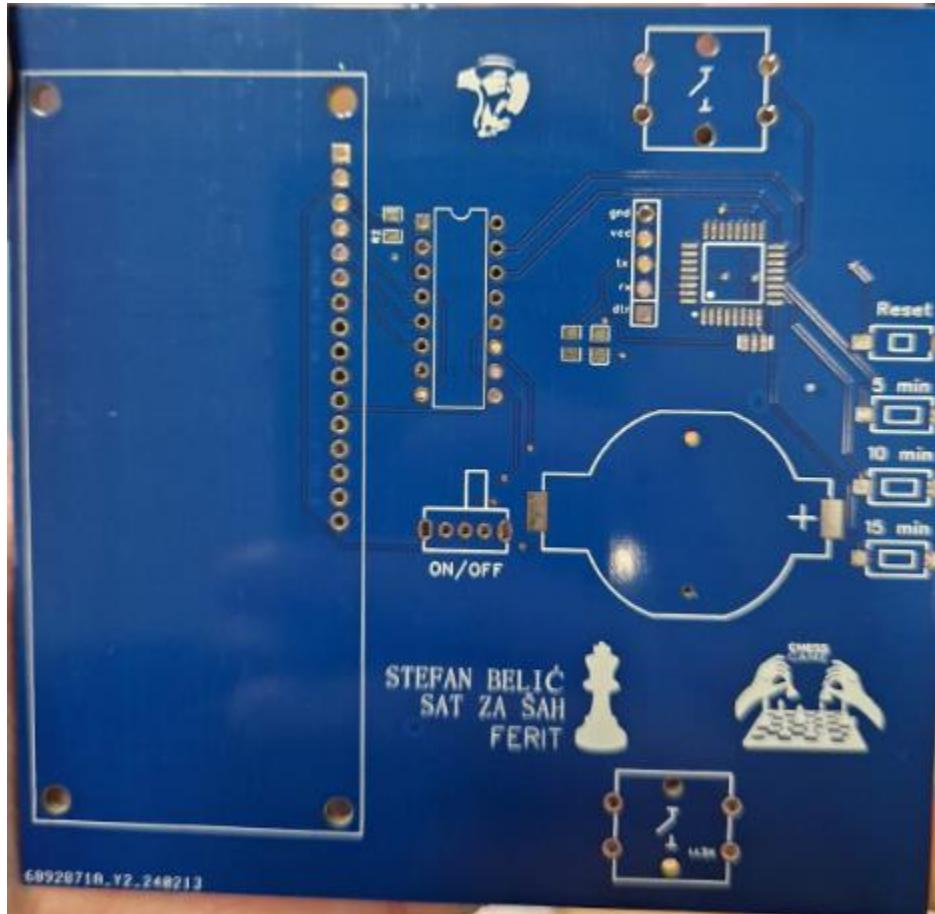
# PCB layout



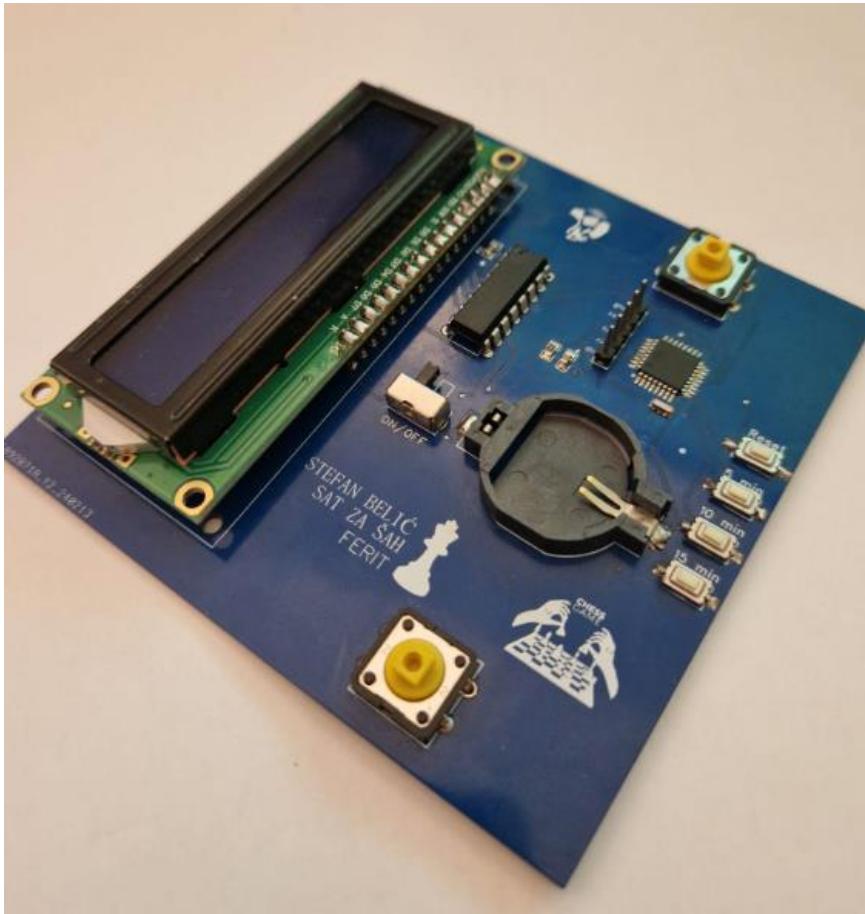
# 3D model



# Prazna pločica



# Gotov model



# Program

```
1 const int btn5Min = 7;
2 const int btn10Min = 6;
3 const int btn15Min = 5;
4 const int resetBtn = 2;
5 const int player1Btn = 8;
6 const int player2Btn = 9;
7
8 unsigned long timePlayer1 = 0;
9 unsigned long timePlayer2 = 0;
10 unsigned long lastUpdate;
11 bool player1Turn = true;
12 bool gameStarted = false;
13
14 unsigned long lastDebounceTime = 0;
15 unsigned long debounceDelay = 50;
16
17 void setup() {
18
19     Serial.begin(9600);
20
21     pinMode(btn5Min, INPUT_PULLUP);
22     pinMode(btn10Min, INPUT_PULLUP);
23     pinMode(btn15Min, INPUT_PULLUP);
24     pinMode(resetBtn, INPUT_PULLUP);
25     pinMode(player1Btn, INPUT_PULLUP);
26     pinMode(player2Btn, INPUT_PULLUP);
27
28     resetTime();
29 }
30
31 void loop() {
32     if (!gameStarted) {
33         if (digitalRead(btn5Min) == LOW) {
34             setTime(5);
35             gameStarted = true;
36             lastUpdate = millis();
37         } else if (digitalRead(btn10Min) == LOW) {
38             setTime(10);
39             gameStarted = true;
40             lastUpdate = millis();
41         } else if (digitalRead(btn15Min) == LOW) {
42             setTime(15);
43             gameStarted = true;
44             lastUpdate = millis();
45         }
46     } else {
47         if (digitalRead(resetBtn) == LOW) {
48             | resetTime();
49         }
50         unsigned long currentMillis = millis();
51         if (player1Turn) {
52             | timePlayer1 -= (currentMillis - lastUpdate);
53         } else {
54             | timePlayer2 -= (currentMillis - lastUpdate);
55         }
56         lastUpdate = currentMillis;
57         if (timePlayer1 <= 0) {
58             Serial.println("Player 1's time has expired. Player 2 wins!");
59             gameStarted = false;
60             resetTime();
61         } else if (timePlayer2 <= 0) {
62             Serial.println("Player 2's time has expired. Player 1 wins!");
63             gameStarted = false;
64             resetTime();
65         }
66         unsigned long buttonPressTime = millis();
67         if ((buttonPressTime - lastDebounceTime) > debounceDelay) {
68             if (digitalRead(player1Btn) == LOW && player1Turn) {
69                 | switchPlayer();
70                 lastDebounceTime = buttonPressTime;
71             } else if (digitalRead(player2Btn) == LOW && !player1Turn) {
72                 | switchPlayer();
73                 lastDebounceTime = buttonPressTime;
74             }
75             displayTime();
76         }
77     }
78 }
79
80 void resetTime() {
81     timePlayer1 = 0;
82     timePlayer2 = 0;
83     player1Turn = true;
84     gameStarted = false;
85 }
86
87 void setTime(int minutes) {
88     unsigned long setTime = minutes * 60000;
89     timePlayer1 = setTime;
90     timePlayer2 = setTime;
91 }
92
93 void switchPlayer() {
94     unsigned long currentMillis = millis();
95     if (player1Turn) {
96         | timePlayer1 -= (currentMillis - lastUpdate);
97     } else {
98         | timePlayer2 -= (currentMillis - lastUpdate);
99     }
100    lastUpdate = currentMillis;
101    player1Turn = !player1Turn;
102 }
103
104 void displayTime() {
105     Serial.print("Player 1 Time: ");
106     Serial.print(timePlayer1 / 1000);
107     Serial.print("s   ");
108
109     Serial.print("Player 2 Time: ");
110     Serial.print(timePlayer2 / 1000);
111     Serial.println("s");
112 }
```

# Zaključak

- Nedostatak pločice - pri izradi sheme je krivo spojen I2C i LCD 16x2 sa Atmega328P mikrokontrolerom te zbog toga nije u funkciji ekran na modelu. Fale 2 dodatna otpornika od  $10\text{ k}\Omega$  spojena na SCL i SDA kod I2C-a, prilikom naručivanja VSS i VDD su bili spojeni na VCC. VSS mora biti spojen na GND.
- Postavljeni kod omogućuje rad pločice na serial monitoru.
- Baterija od 3V bi bila pre slaba za LCD.
- Rješenje za taj problem bi bio drugi izvor napajanja.