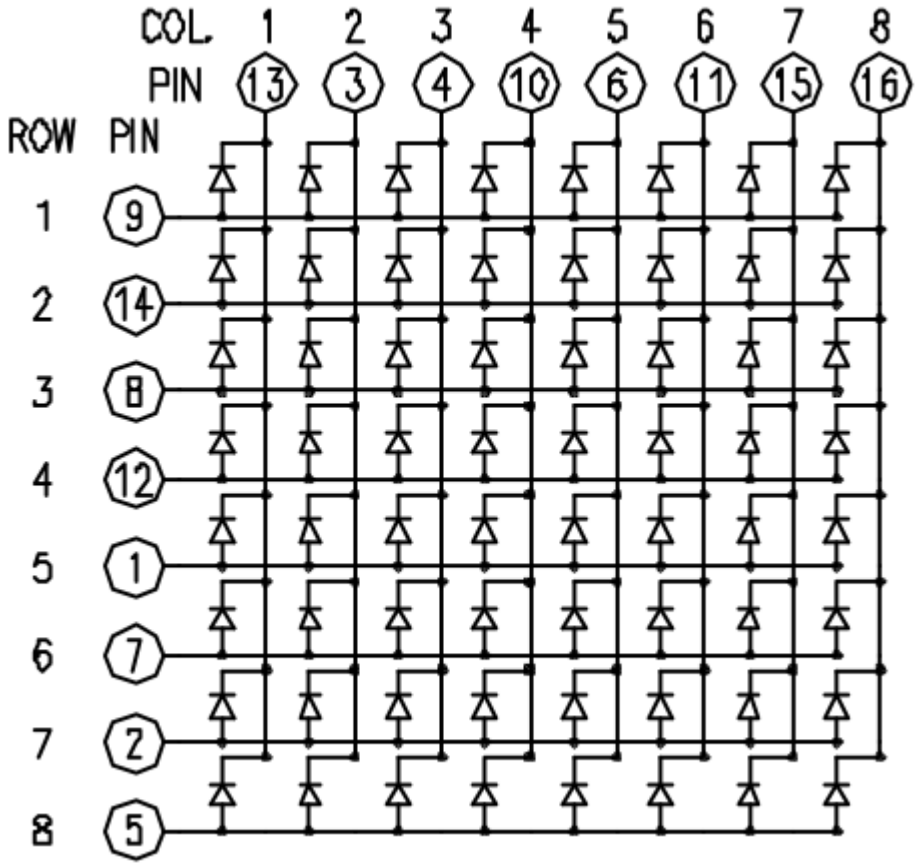
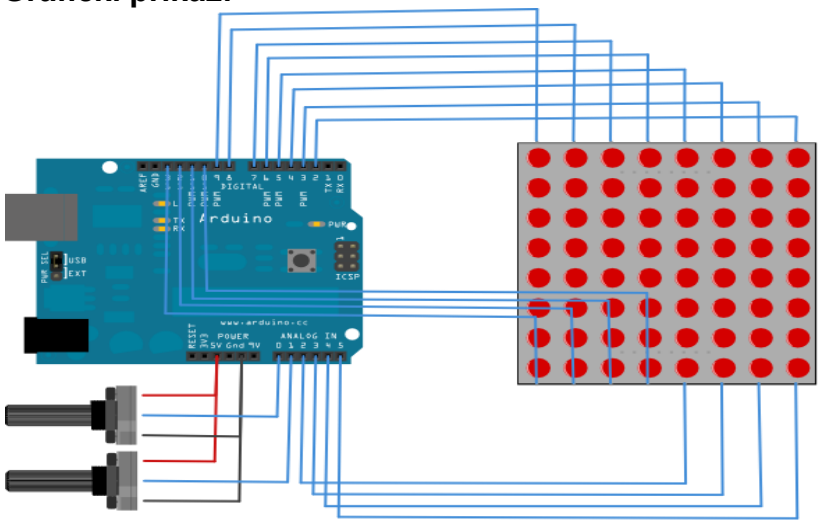
Nastavni predmet:	**UGRADBENI RAČUNALNI SUSTAVI**
Vježba br.2:	**8X8 Matrica**
Cilj vježbe:	**Naučiti pokrenuti matricu i upravljati njome pomoću potenciometara**

Električna shema 8X8 matrice. To je mreža led dioda. Pinovima upravljamo redovima i stupcima.



Zadatak 1: Spoji 8X8 matricu prema shemi i napiši program kojim ćeš upravljati jednom točkom na matrici pomoću 2 potenciometra.

Grafički prikaz:



Tablica rasporeda pinova matrice:

Broj pina matrice	Red	Stupac	Broj pina na Arduinu
1	5	-	13
2	7	-	12
3	-	2	11
4	-	3	10
5	8	-	16 (analog pin 2)
6	-	5	17 (analog pin 3)
7	6	-	18 (analog pin 4)
8	3	-	19 (analog pin 5)
9	1	-	2
10	-	4	3
11	-	6	4
12	4	-	5
13	-	1	6
14	2	-	7
15	-	7	8
16	-	8	9

Kod zadatka:

```
const int col[8] = { 2, 7, 19, 5, 13, 18, 12, 16};
const int row[8] = { 6, 11, 10, 3, 17, 4, 8, 9};
int x,y;

void setup() {
  for (int Pin=0; Pin<8; Pin++) {
    pinMode(row[Pin], OUTPUT);
    pinMode(col[Pin], OUTPUT);
  }
  for(int i=0;i<8;i++)
  digitalWrite(col[i], HIGH);
}

void loop() {
  int xp,yp;
  xp=analogRead(A0);
  yp=analogRead(A1);
  digitalWrite(col[x], HIGH);
  digitalWrite(row[y], LOW);                    //brisanje prijašnje pozicije
  x = map(xp, 0, 1023, 0, 7);
  y = map(yp, 0, 1023, 0, 7);
  digitalWrite(col[x], LOW);
  digitalWrite(row[y], HIGH);                   //nova pozicija
}
```

Zadatak 2: Spoji 8X8 matricu prema shemi iz zadatka 1 (bez potenciometara) napiši program koji će nasumično paliti jednu točku na matrici.

Kod zadatka:

```
const int col[8] = { 2, 7, 19, 5, 13, 18, 12, 16};
const int row[8] = { 6, 11, 10, 3, 17, 4, 8, 9};
int x,y;
int i;
void setup() {
  for ( int thisPin=0; thisPin<8; thisPin++) {
    pinMode(col[thisPin], OUTPUT);
    pinMode(row[thisPin], OUTPUT);
  }
  for(i=0;i<8;i++)
  digitalWrite(row[i], HIGH);
}
void loop() {
  for( i=0; i<8; i++){
    digitalWrite(row[i], LOW);
    digitalWrite(col[i], HIGH);
  }
  x=random(8);
  y=random(8);
  digitalWrite(col[x], LOW);
  digitalWrite(row[y], HIGH);
  delay(200);
}
```

Zadatak 3: Spoji 8X8 matricu prema shemi iz zadatka 1 (bez jednog potenciometra) i napiši program kojim će se moći mijenjati brzina kojom se nasumično prikazuje točka pomoću potenciometra.

Kod zadatka:

```
const int col[8] = { 2, 7, 19, 5, 13, 18, 12, 16};
const int row[8] = { 6, 11, 10, 3, 17, 4, 8, 9};
int x,y;
int i,r;

void setup() {
  for ( int thisPin=0; thisPin<8; thisPin++) {
    pinMode(col[thisPin], OUTPUT);
    pinMode(row[thisPin], OUTPUT);
  }
  for(i=0;i<8;i++)
  digitalWrite(row[i], HIGH);
}

void loop() {
  r=map(analogRead(A0), 0, 1023, 0, 1000);
  for( i=0; i<8; i++){
    digitalWrite(row[i], LOW);
    digitalWrite(col[i], HIGH);
  }
  x=random(8);
  y=random(8);
  digitalWrite(col[x], LOW);
  digitalWrite(row[y], HIGH);
  delay(r);
}
```

Zadatak 4: Spoji 8X8 LED matricu prema shemi iz 1. zadatka. Napiši program koji će svakih 500ms paliti po 1 diodu dijagonalno počevši od gornjeg lijevog ugla.

Kod zadatka:

```
const int col[8] = {2, 7, 19, 5, 13, 18, 12, 16};
const int row[8] = {6, 11, 10, 3, 17, 4, 8, 9};

void setup() {
  int i;
  for (i=0;i<8;i++) {
    pinMode(row[i], OUTPUT);
    pinMode(col[i], OUTPUT);
  }
  for(i=0;i<8;i++){
    digitalWrite(col[i], HIGH);
    digitalWrite(row[i], LOW);
  }
}

void loop() {
  for(int i=0;i<8;i++){
    digitalWrite(col[i], LOW);
    digitalWrite(row[i], HIGH);
    delay(500);
    digitalWrite(col[i], HIGH);
    digitalWrite(row[i], LOW);
  }
}
```

Zadatak 5: Spoji 8X8 LED matricu prema shemi iz 1. zadatka. Napiši program koji će upaliti diode u obliku slova H.
Ovog oblika:

```
  01100110
  01100110
  01100110
  01111110
  01111110
  01100110
  01100110
  01100110
```

Kod zadatka:

```
int x,y;

const int col[8] = {2, 7, 19, 5, 13, 18, 12, 16};
const int row[8] = {6, 11, 10, 3, 17, 4, 8, 9};

const int co[8][8] = {{LOW,HIGH,HIGH,LOW,LOW,HIGH,HIGH,LOW},
                      {LOW,HIGH,HIGH,LOW,LOW,HIGH,HIGH,LOW},
                      {LOW,HIGH,HIGH,LOW,LOW,HIGH,HIGH,LOW},
                      {LOW,HIGH,HIGH,HIGH,HIGH,HIGH,HIGH,LOW},
                      {LOW,HIGH,HIGH,LOW,LOW,HIGH,HIGH,LOW},
                      {LOW,HIGH,HIGH,LOW,LOW,HIGH,HIGH,LOW},
```

```
                {LOW,HIGH,HIGH,LOW,LOW,HIGH,HIGH,LOW},
                {LOW,HIGH,HIGH,LOW,LOW,HIGH,HIGH,LOW}

                };

void setup() {
  int i;
  for (i=0;i<8;i++) {
    pinMode(row[i], OUTPUT);
    pinMode(col[i], OUTPUT);
  }
  for(i=0;i<8;i++){
    digitalWrite(col[i], HIGH);
    digitalWrite(row[i], LOW);
  }
}

void loop() {
   for(x=0;x<8;x++){
    digitalWrite(col[x],LOW);
    for(y=0;y<8;y++){
      digitalWrite(row[y],co[x][y]);
    }
    digitalWrite(col[x],HIGH);
   }
}
```