Arduino Workshop

3x3x3 LED CUBE

Agenda

Kort om arduino

Hva er en arduino?
Hvorfor arduino?
Utbytte

Koding med C++

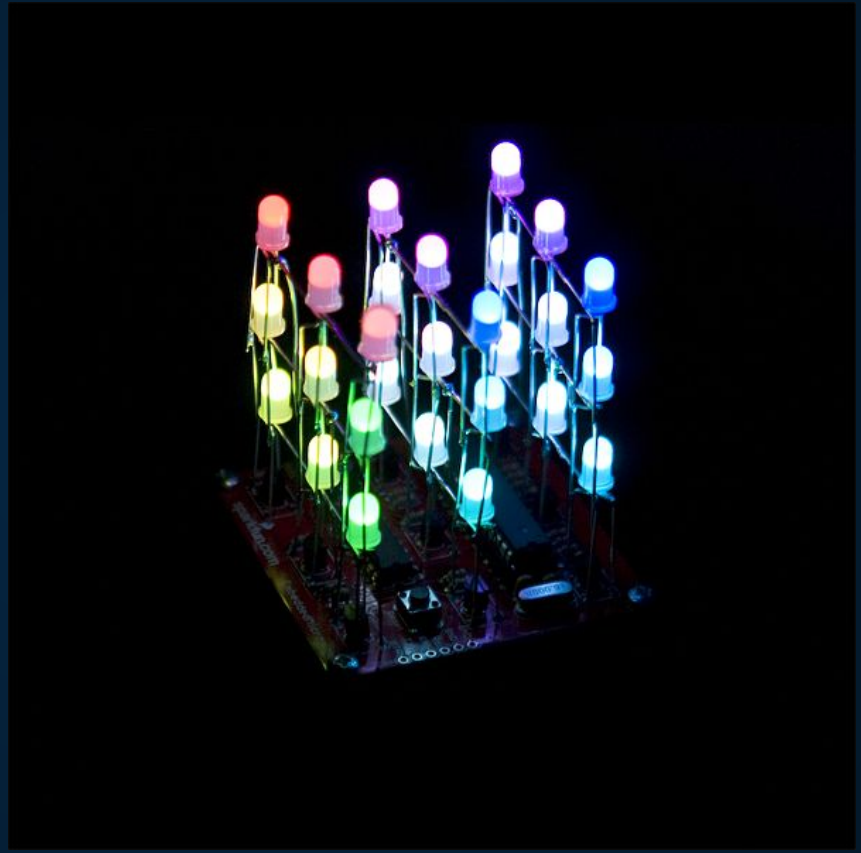
Bli kjent med kodespråket C++
Arduino IDE

Elektriske komponenter

LED lys
Motstand
Breadboard

Dagens prosjekt

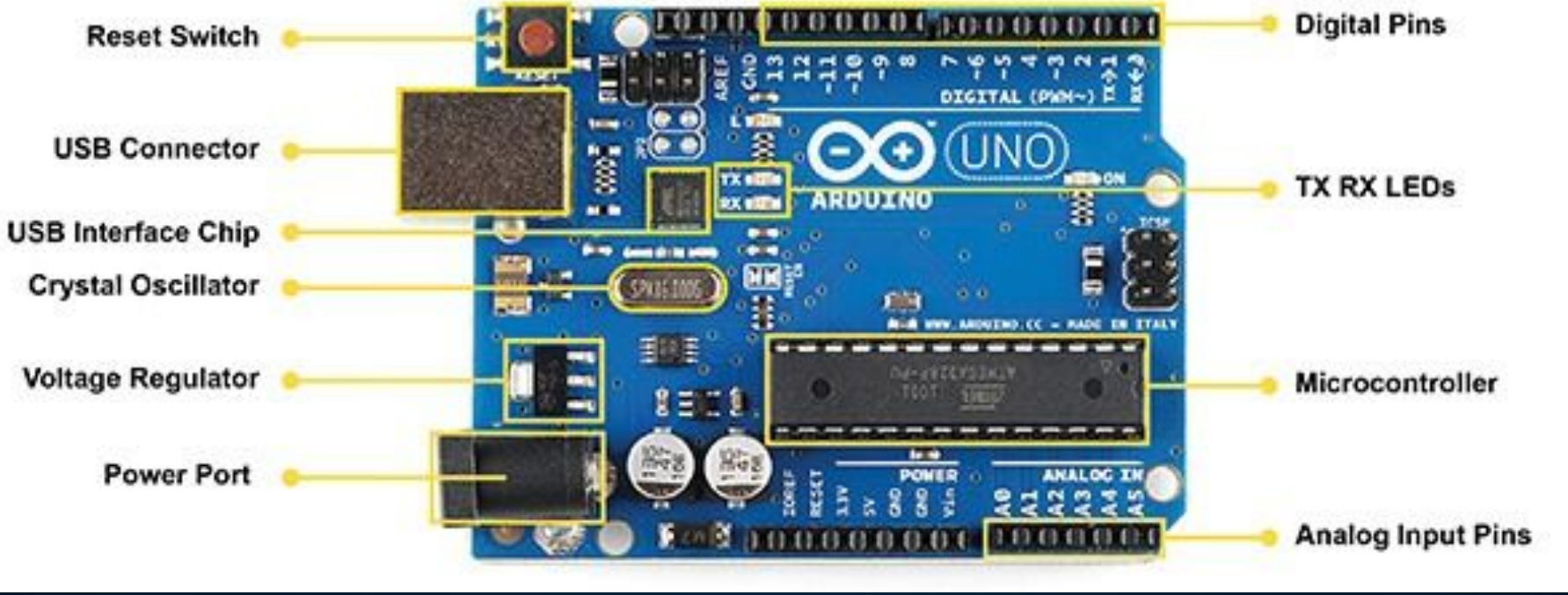
Ønsket resultat
Fremgangsmåte



Arduino

- “Mikrokontroller” -> veldig liten datamaskin
- Leser innganger og gjør det om til utganger
- Enkelt og billig
- Gir et bredt spekter av muligheter
  - LED-cube
  - Lese av sensorer
  - Aktivere motorer
  - Selvkjørende roboter

Forstå brettet

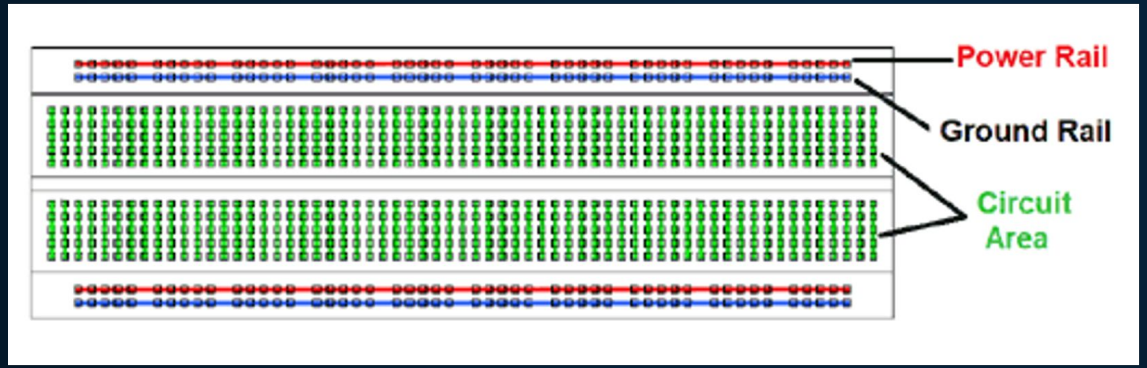


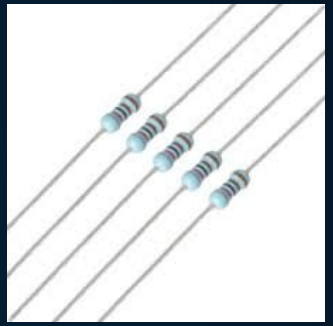
Arduino IDE

- Åpen kildekode
- Kode manipulerer arduinoen til å gjøre ønskede oppgaver
- Språket brettet forstår er C++

Elektronikk

- LED pærer, tåler en begrenset mengde strøm → motstandere
- 20 mA med motstandere på 220 ohm

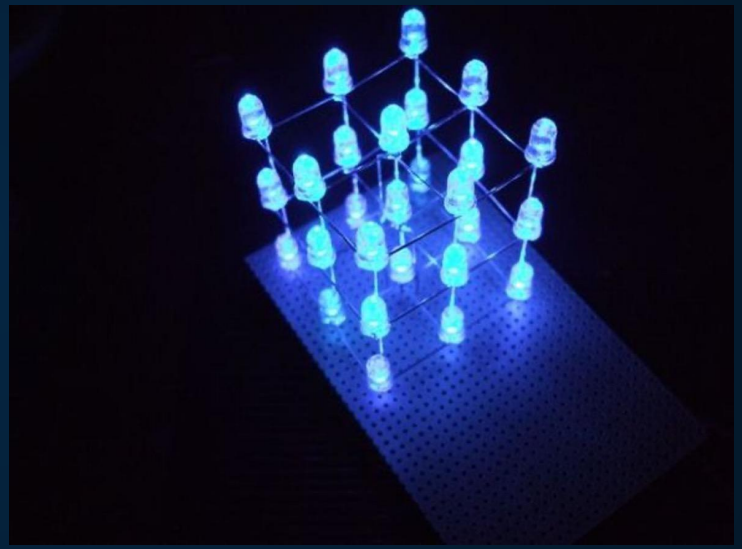




Dagens prosjekt: 3x3 LED “cube”

Trenger:

- 1 Arduino
- 1 breadboard
- 3 resistorer (220 ohm)
- 27 LEDs
- 1 USB kabel
- 12 jumper wires
- 3 female-to-male wires
- 36 skjøtehylser
- Arduino IDE



3x3x3 LED-Cube

https://www.youtube.com/watch?v=93xCmTTXDUg

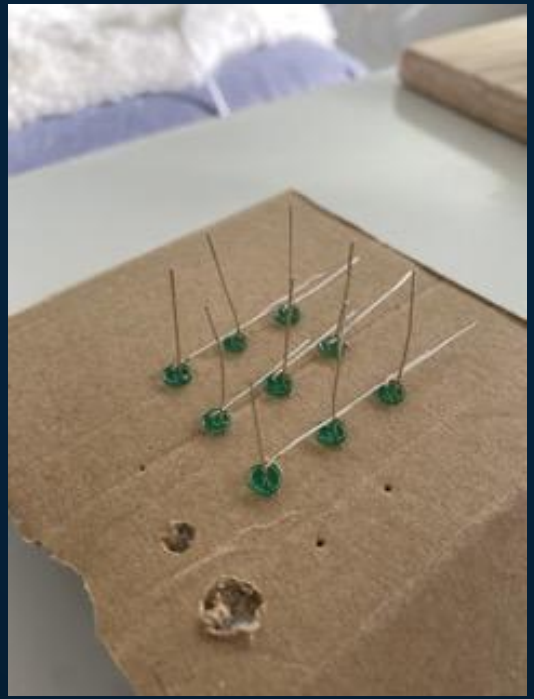
16x16x16 LED-Cube

https://www.youtube.com/watch?v=ciaFar8nfHc&t=961s

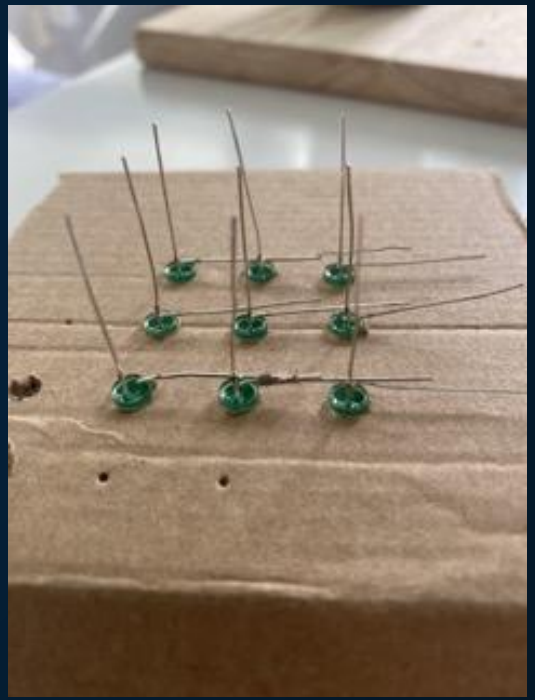
Fremgangsmåte

Step 1:

Step 2:



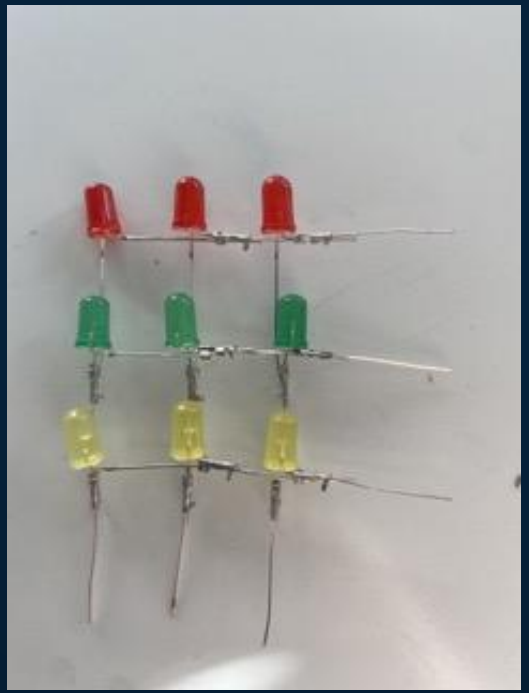
Step 3:



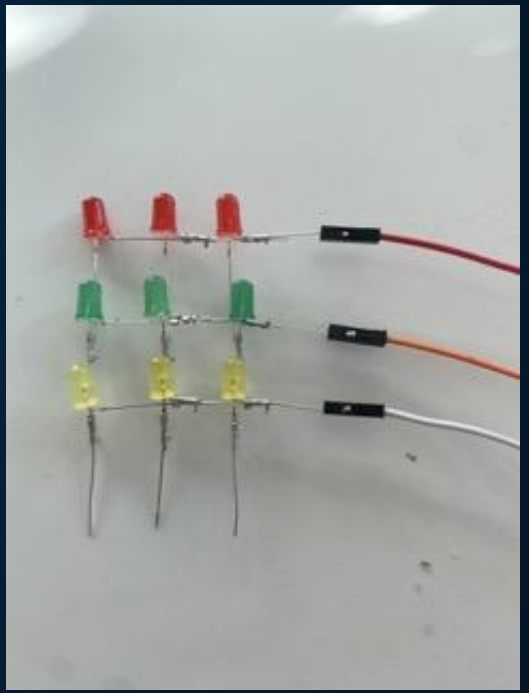
Fremgangsmåte

Step 4:

Step 5:

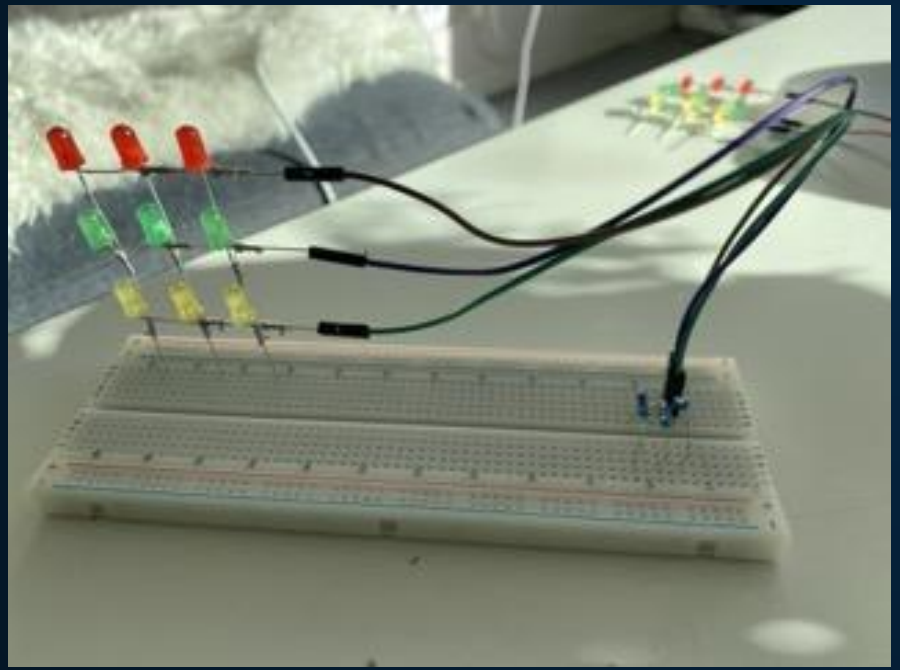


Step 6:

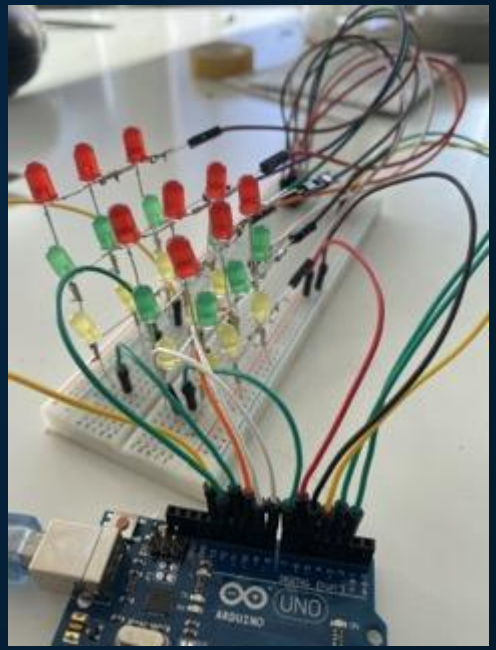


Fremgangsmåte

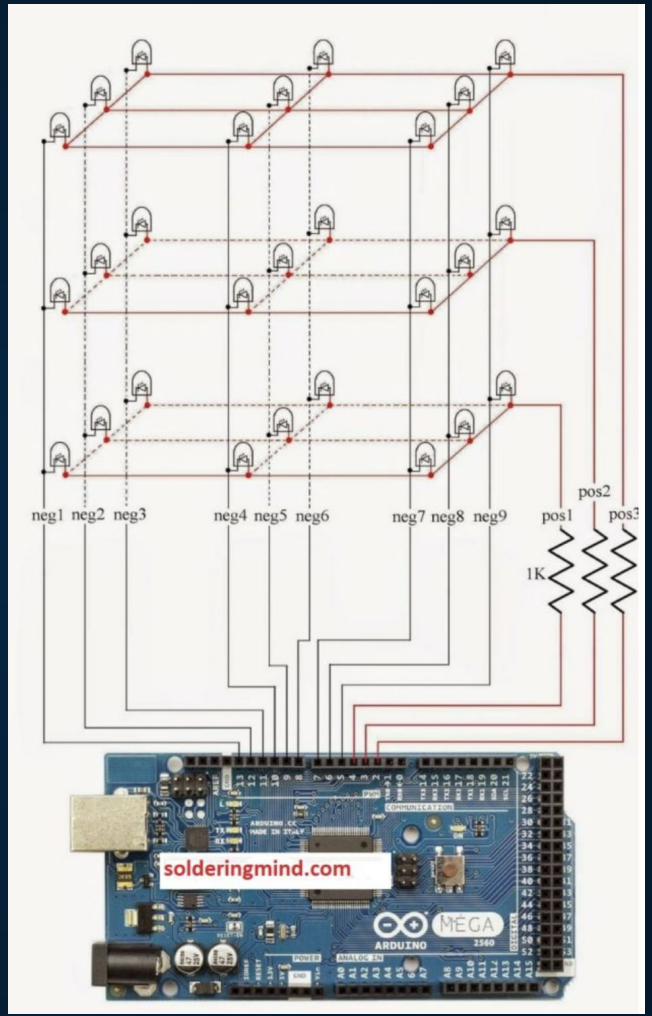
Step 7:



Finish:



Koblingsdiagrammet



Koden

```

int neg1 = 13;  //"neg1" is connected to the 13th digital pin of arduino
int neg2 = 12;  //"neg2" is connected to the 12th digital pin of arduino
int neg3 = 11;  //"neg3" is connected to the 11th digital pin of arduino
int neg4 = 10;  //"neg4" is connected to the 10th digital pin of arduino
int neg5 = 9;   //"neg5" is connected to the 9th digital pin of arduino
int neg6 = 8;   //"neg6" is connected to the 8th digital pin of arduino
int neg7 = 7;   //"neg7" is connected to the 7th digital pin of arduino
int neg8 = 6;   //"neg8" is connected to the 6th digital pin of arduino
int neg9 = 5;   //"neg9" is connected to the 5th digital pin of arduino

int pos1 = 4;   //"pos1" is connected to the 4th digital pin of arduino
int pos2 = 3;   //"pos2" is connected to the 3rd digital pin of arduino
int pos3 = 2;   //"pos3" is connected to the 2nd digital pin of arduino

int delay_time=100, j=0;

// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pin as an output.
  pinMode(neg1, OUTPUT);
  pinMode(neg2, OUTPUT);
  pinMode(neg3, OUTPUT);
  pinMode(neg4, OUTPUT);
  pinMode(neg5, OUTPUT);
  pinMode(neg6, OUTPUT);
  pinMode(neg7, OUTPUT);
  pinMode(neg8, OUTPUT);
  pinMode(neg9, OUTPUT);

  pinMode(pos1, OUTPUT);
  pinMode(pos2, OUTPUT);
  pinMode(pos3, OUTPUT);
}
```

```

// the loop routine runs over and over again forever:
void loop() {
  for(j=0;j<6;j++)
  {
    digitalWrite(pos1, HIGH);
    digitalWrite(pos2, HIGH);
    digitalWrite(pos3, LOW);

    digitalWrite(neg1, LOW);
    digitalWrite(neg2, LOW);
    digitalWrite(neg3, HIGH);
    digitalWrite(neg4, LOW);
    digitalWrite(neg5, LOW);
    digitalWrite(neg6, HIGH);
    digitalWrite(neg7, LOW);
    digitalWrite(neg8, LOW);
    digitalWrite(neg9, HIGH);

    delay(150);


```

Spørsmål?