

Micro:Maqueen

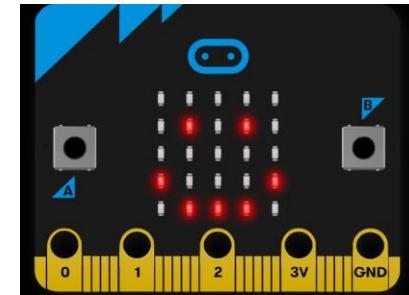
obrazovni robot u razrednoj nastavi

Valentina Blašković, Prva osnovna škola Ogulin

Daniela Orlović, OŠ Draganići, OŠ Mahično

Zašto Micro:Maqueen?

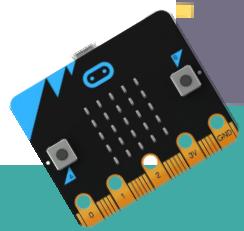
- pristupačna cijena
- jednostavna konstrukcija i korištenje
- veličina dlana
- jednostavan za početnike
- programiranje pomoću blok naredbi Mind+
- upravljanje uz pomoć Micro:bita



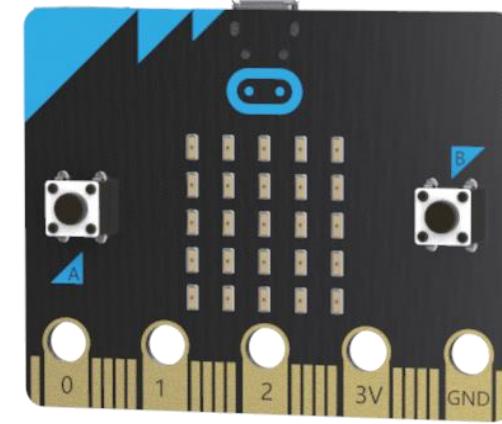
Što je Micro:Maqueen?

Micro:Maqueen je mobilni robot upravljan **micro:bitom** koji sadrži:

- *ultrazvučni senzor,*
- *senzor za praćenje linije,*
- *zujalicu,*
- *svjetleće diode te*
- *priklučke za dodatne komponente.*



Dijelovi



micro:bit pločica



Držač baterija

Ultrazvučni senzor



Motor

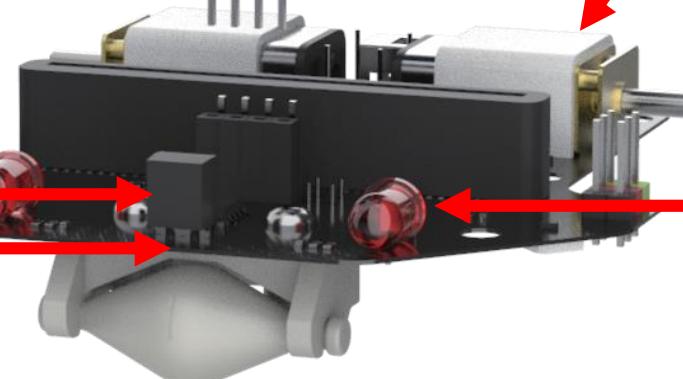


Kotači

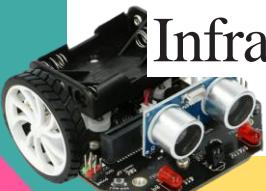
Zujalica



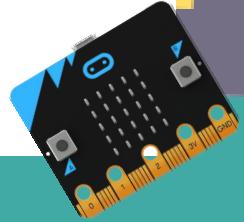
Infracrveni prijemnik

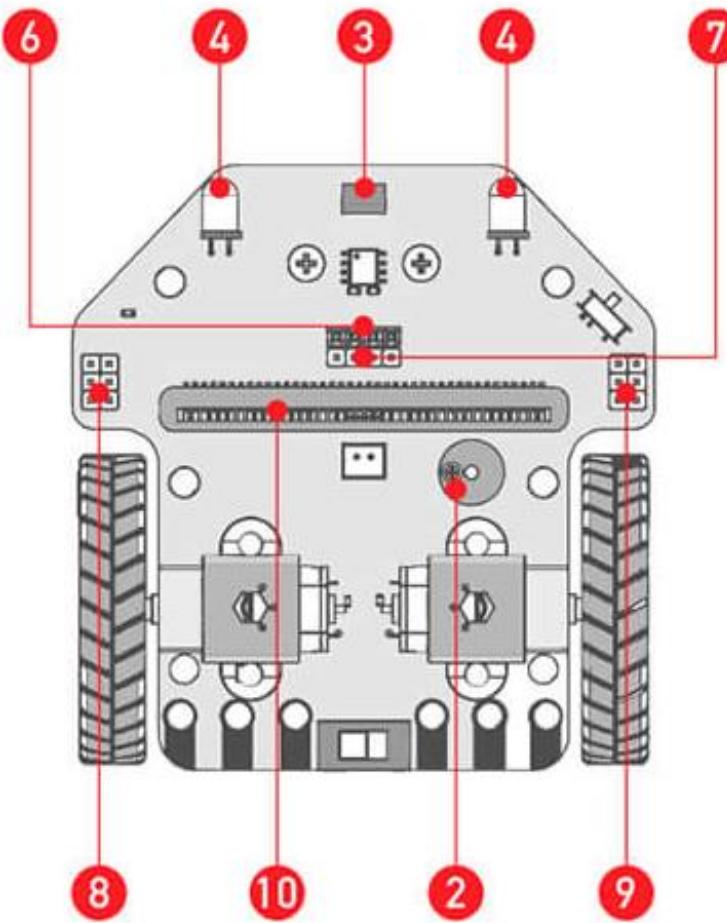


LED Svjetla

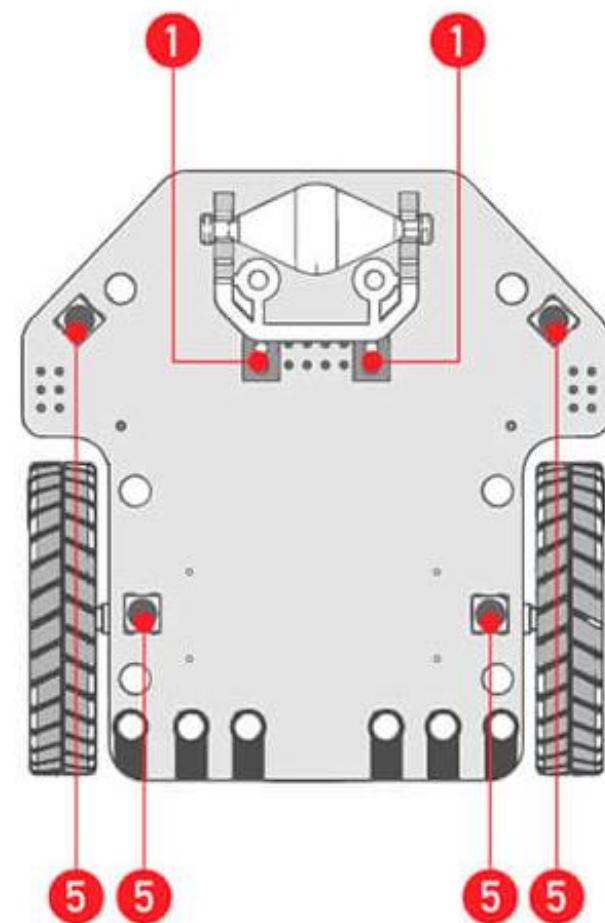


Izvor: [DFROBOT](#)





1. Senzori za praćenje linije
2. Zujalica
3. IR prijamnik
4. Svjetleće diode
5. RGB diode
6. Priklučak za ultrazvučni senzor
7. I2C sučelje
8. Priklučci za servo motore
9. Priklučci za dodatne komponente
10. Priklučak za micro:bit pločicu



Izvor: [DFROBOT](#)

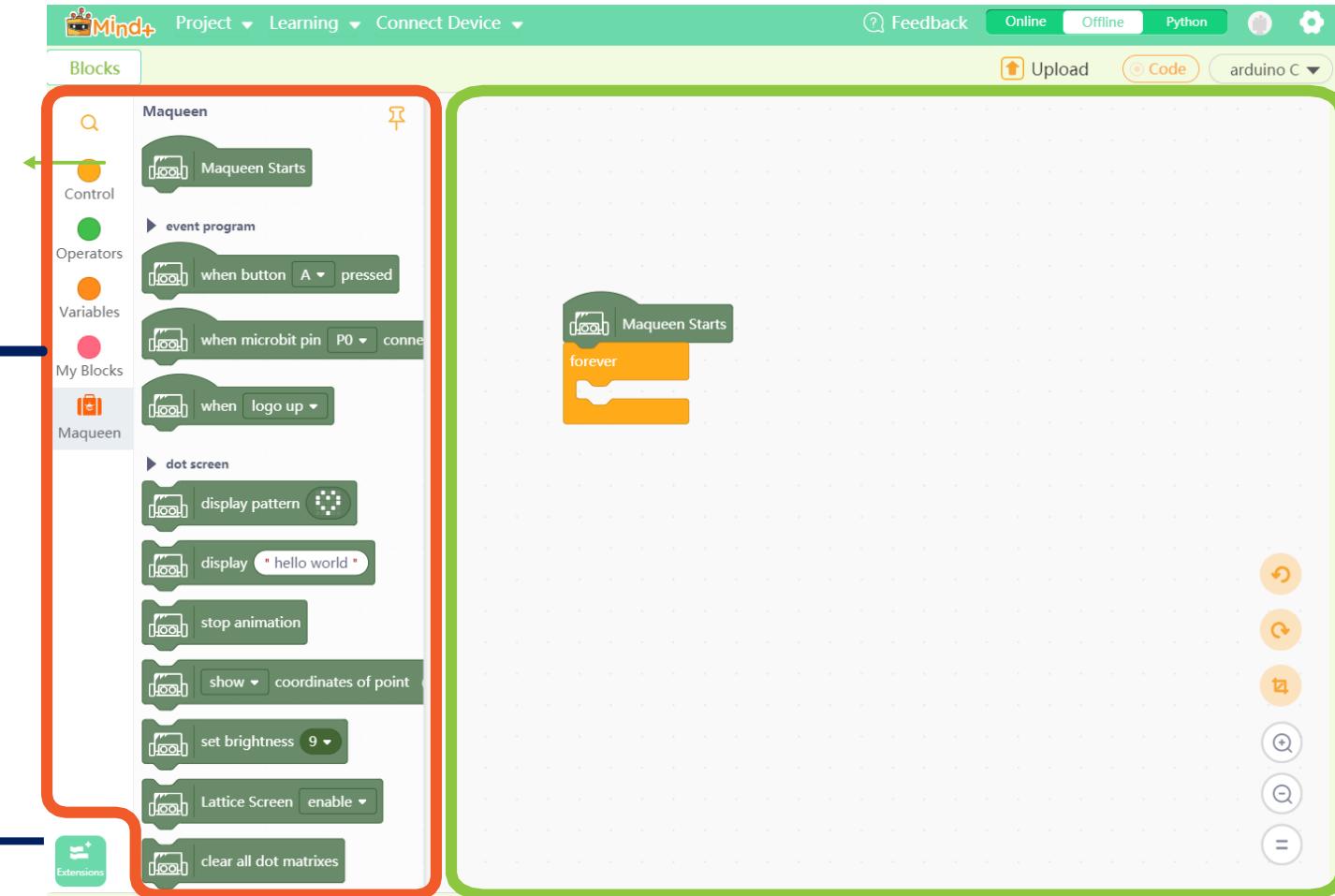


Mind+



Preuzimanje programa Mind+

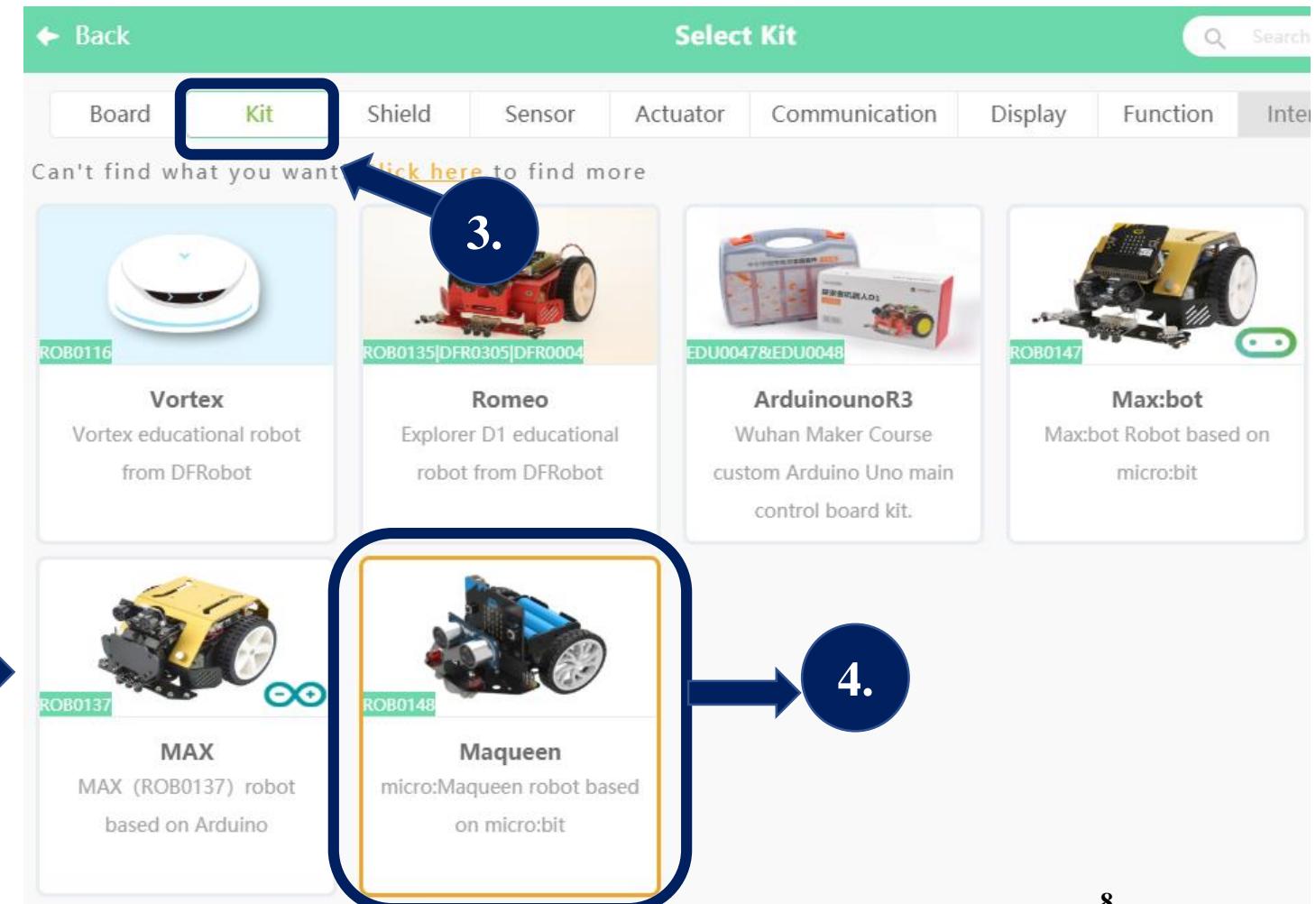
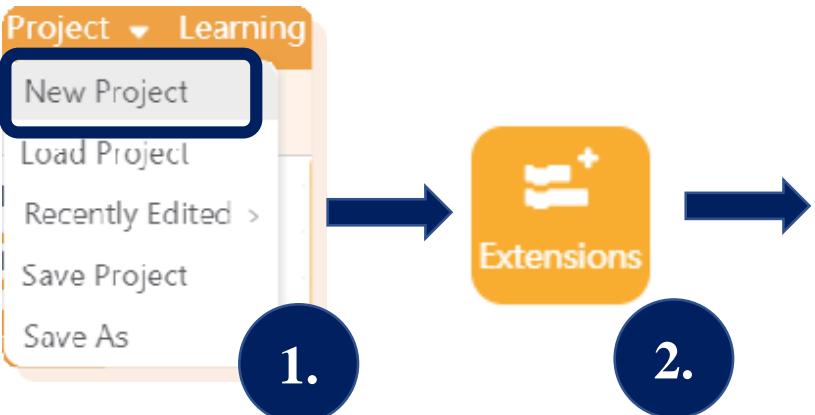
Posjetite mrežnu stranicu na poveznici <http://www.mindplus.cc> kako bi preuzeли program.



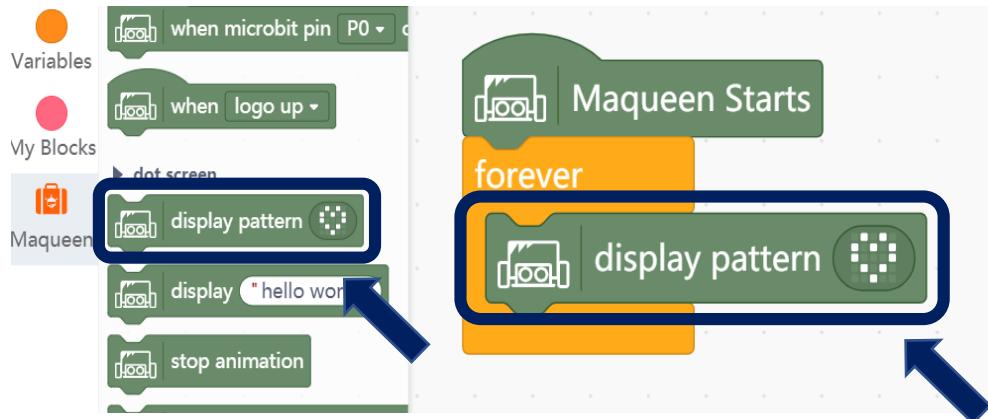
Proširenja

PRIPREMA

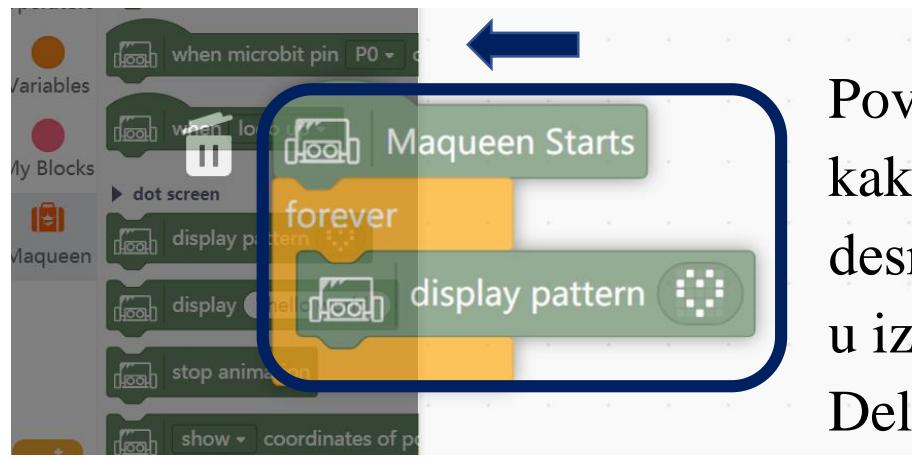
Za programiranje **micro:Maqueen** robota potrebno je u **Mind+** dodati proširenja s naredbama za njegovo kretanje, praćenje linije, detektiranje prepreka, uključivanje i isključivanje svjetlećih dioda i drugo.



DODAVANJE NAREDBI I NJIHOVO BRISANJE IZ EDITORA



Povuci naredbu u editor držeći lijevu tipku miša.



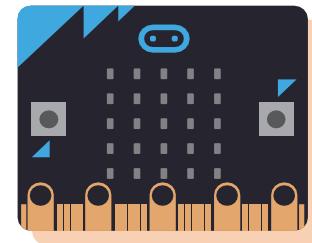
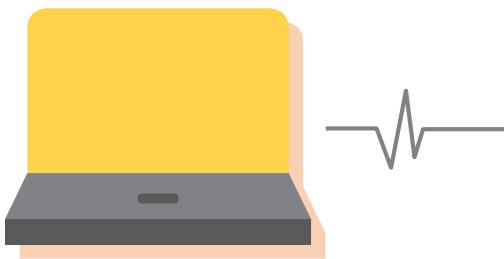
Povuci blok u lijevo
kako bi ga obrisali ili
desnim klikom miša
u izborniku odaberi
Delete block.



PRIJENOS PROGRAMA

Prenesite program koji smo napravili na micro:bit kako pokazuje uputa..

1. Povežite micro:bit sa računalom pomoću USB.

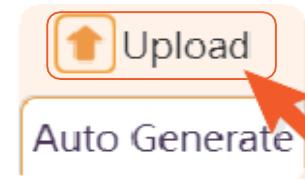


2. Povežite Maqueen sa mind+.



* Ime kanala će se prikazati u izborniku kada se microbit uspješno poveže sa računalom.

3. Prijenos programa na micro: bit

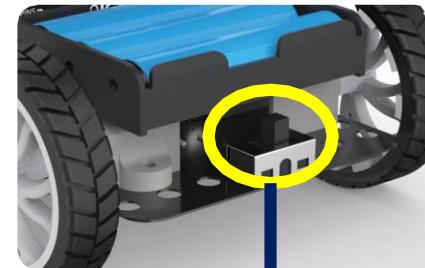


Klik
"Upload"

Kada traka napretka
dosegne 100%,
Prijenos je dovršen.

4. Pokrenite Maqueen

Kada je program prenesen, uključite prekidač za napajanje na kako bi pokrenuli Maqueen.



Uključite prekidač za napajanje

Naredbe iz Maqueen ekstenzije

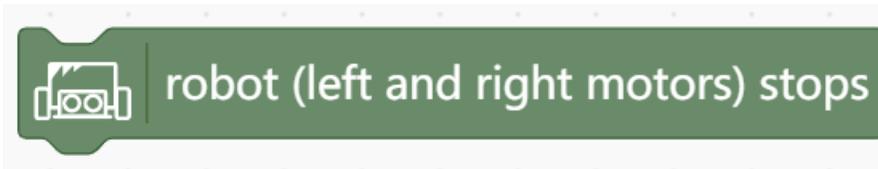
Kontrola motora



- Prvi argument naredbe se odnosi na smjer kretanja robota.
- Drugi argument naredbe je brzina kretanja.
Vrijednost se kreće od 0 do 255.

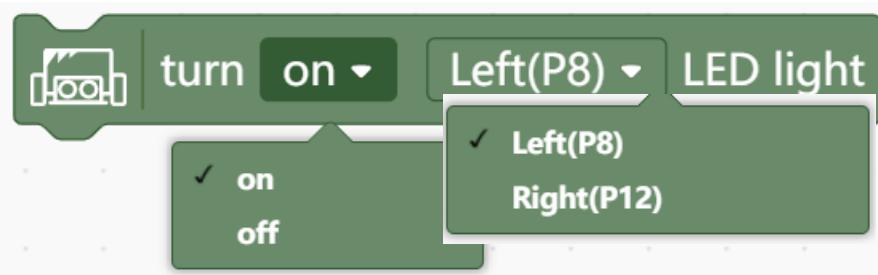


- Prvi argument naredbe označava na koji motor se odnosi – lijevi ili desni.
- Drugi argument naredbe se odnosi na smjer kretanja robota naprijed, nazad, lijevo, desno.
- Treći argument naredbe je brzina kretanja.
Vrijednost se kreće od 0 do 255.
- Naredba za zaustavljanje rad motora.

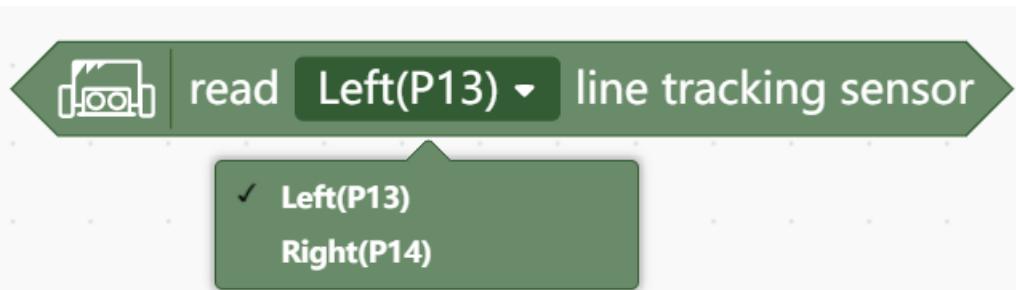




- Naredba u programu javlja vrijednost koju očitava **ultrazvučni senzor**, a to je udaljenost robota od predmeta koji se nalazi ispred njega.



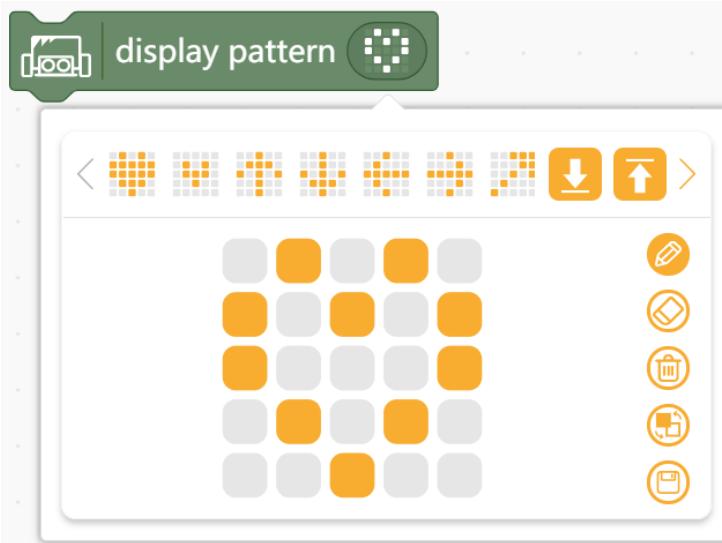
- Prvi argument je ON/OFF i njime se određuje hoće li označena svjetleća diode biti uključena ili isključena.
- Drugi argument označava svjetleću diodu (lijevu ili desnu).



- Naredba u programu javlja vrijednost koju očitava **senzor za praćenje linije**. Ako je senzor na crnoj podlozi, ta vrijednost će biti 0, a ako je na bijeloj podlozi bit će 1.
- Argument left/right označava na koji senzor se naredba odnosi.



- Naredba za uključivanje **RGB svjetlećih dioda** na donjoj strani robota.
- Prvi argument je određuje koja RGB svjetleća diode će biti uključena.
- Drugi argument označava boju kojom će svijetliti RGB svjetleća dioda.



- Naredba za prikaz **uzorka** na micro:bitu



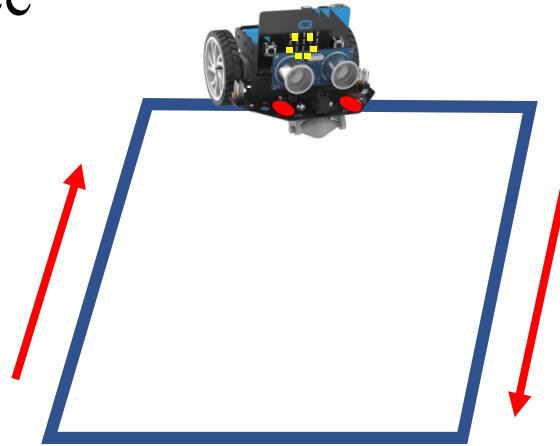
- Naredba za prikaz **teksta** na micro:bitu

1. Zadatak

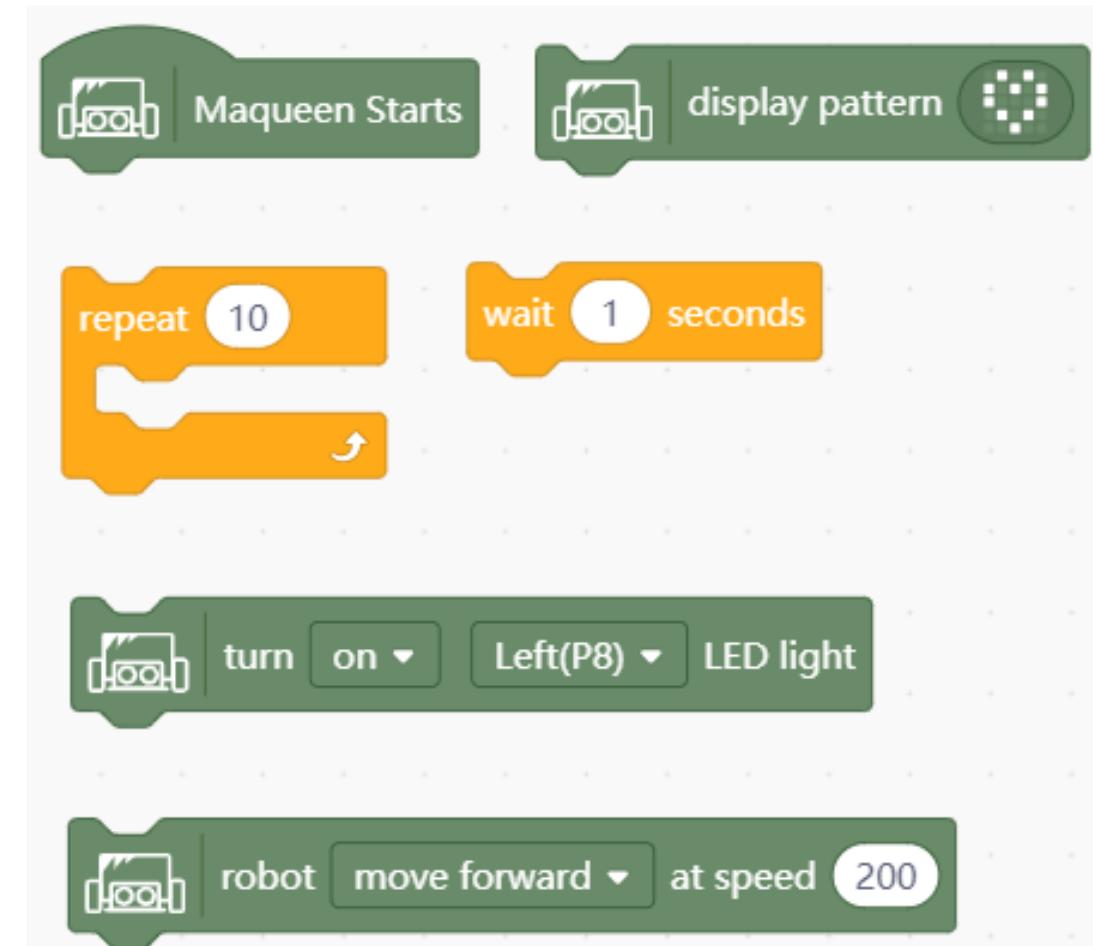
Kretanje Maqueena

Zadatak:

- Uključite LED svjetla na Maqueenu
- Prikažite nasmiješeno lice
- Maqueen prošeće stazom u obliku kvadrata
- Zaustavite Maqueen
- Prikažite tužno lice



Naredbe:



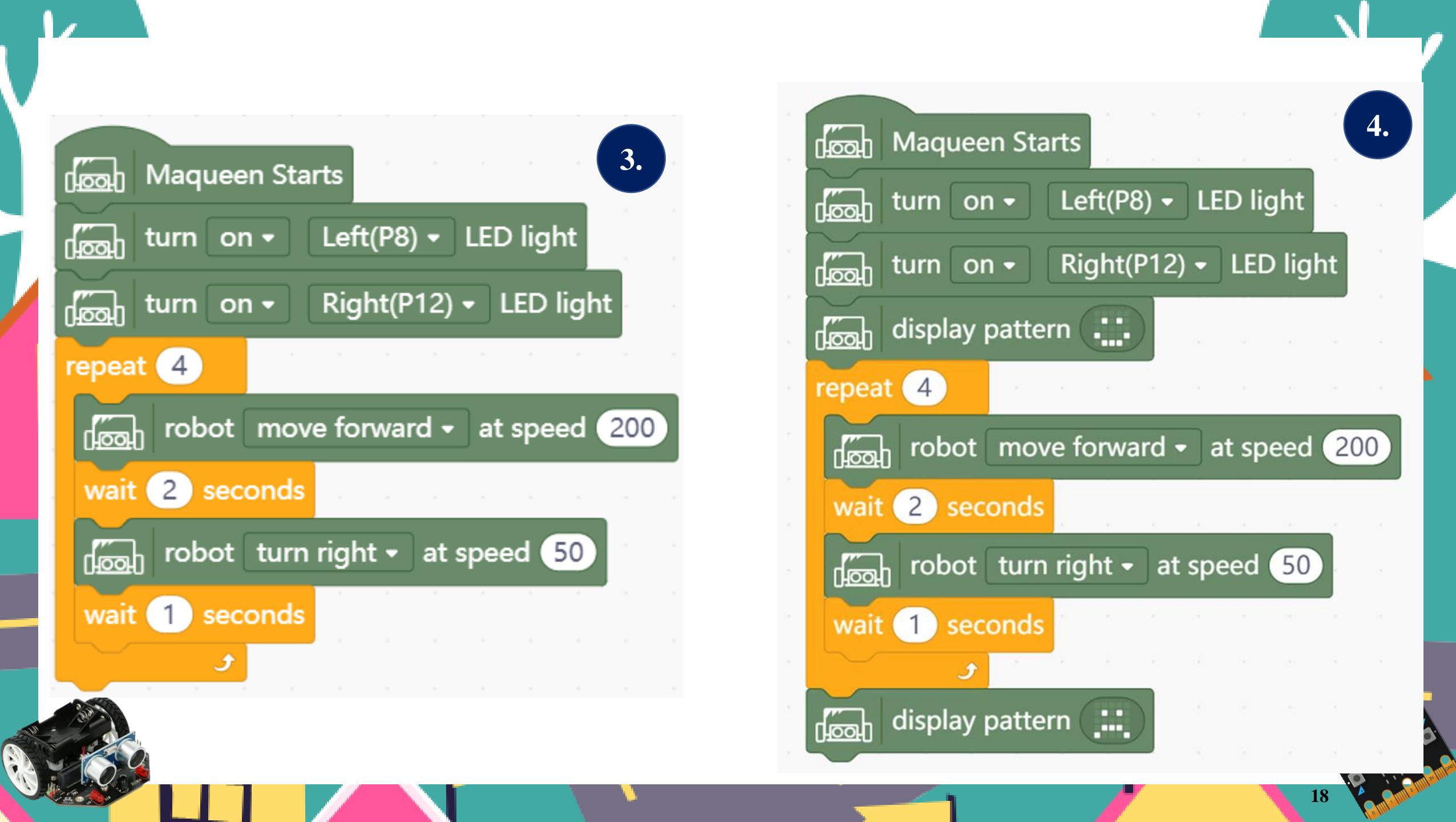
1.

```
Maqueen Starts
robot [move forward v] at speed [200]
wait [2] seconds
robot [turn right v] at speed [50]
wait [1] seconds
```

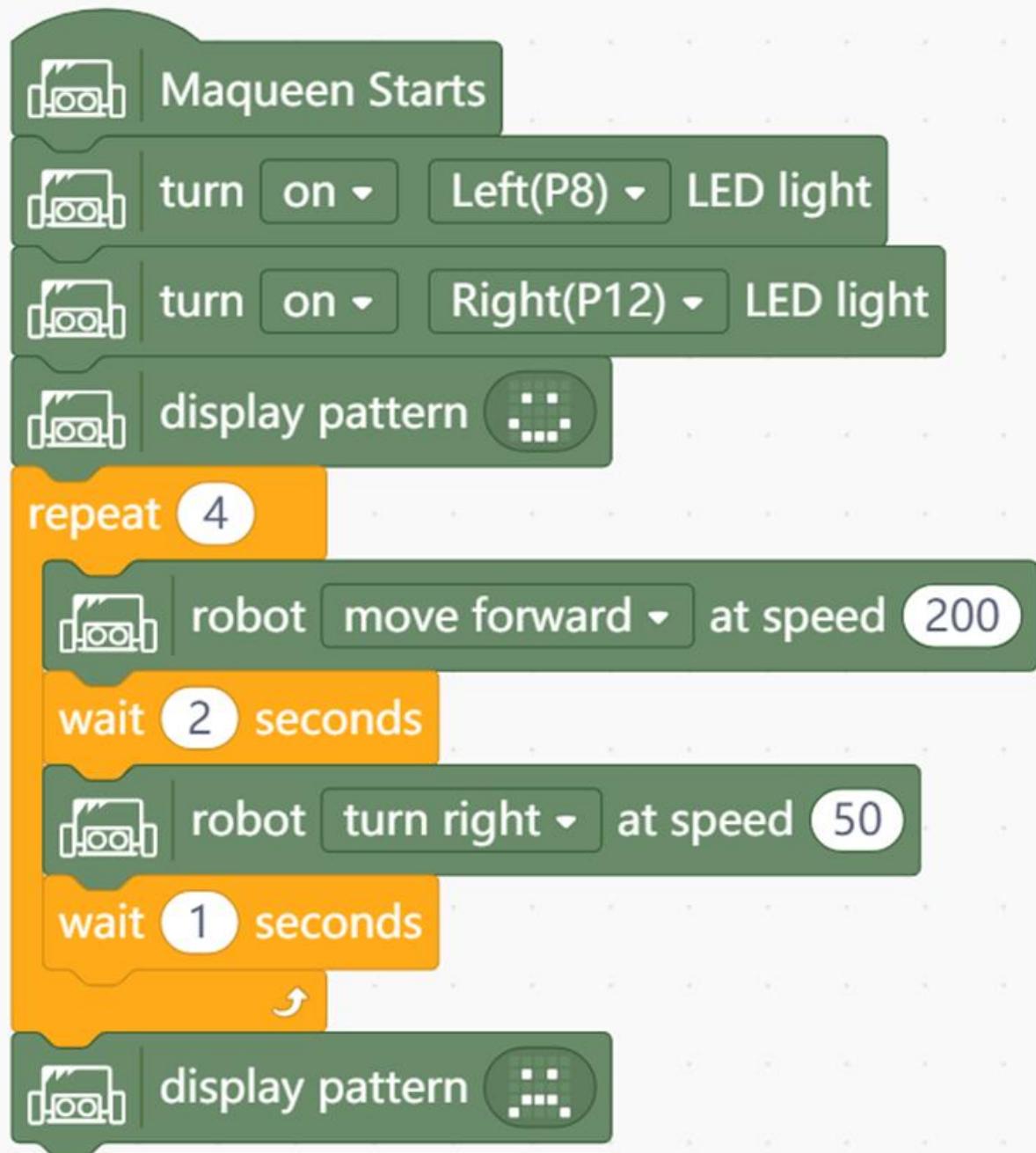
2.

```
Maqueen Starts
repeat (4)
  robot [move forward v] at speed [200]
  wait [2] seconds
  robot [turn right v] at speed [50]
  wait [1] seconds
end
```





Rješenje



The Scratch script starts with the "Maqueen Starts" hat block. It then performs two "turn on LED light" blocks (one for the left light at pin P8 and one for the right light at pin P12). Following this, it displays a 4x4 pixel grid pattern. The main loop begins with a "repeat (4)" control block. Inside the loop, the robot moves forward at speed 200, waits 2 seconds, turns right at speed 50, and waits 1 second. After the repeat loop, it displays the same 4x4 pixel grid pattern again.

```
when [Maqueen Starts]
  [turn on v [Left (P8) v LED light]
  [turn on v [Right (P12) v LED light]
  [display pattern v [grid v]
repeat (4)
  [robot move forward v [200] at speed v [200]
  [wait v [2] seconds]
  [robot turn right v [50] at speed v [50]
  [wait v [1] seconds]
end
[display pattern v [grid v]]
```



2. Zadatak

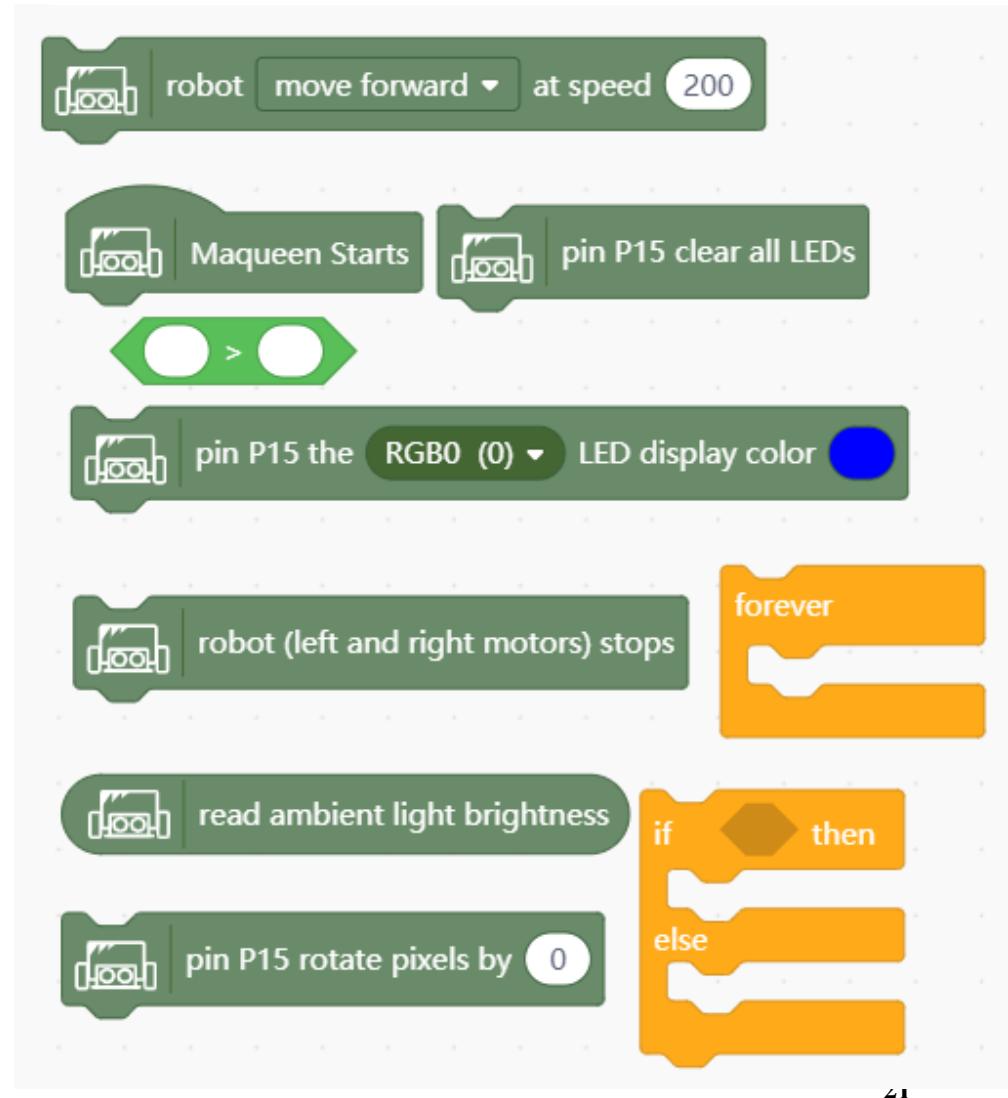
Hvatač svjetla



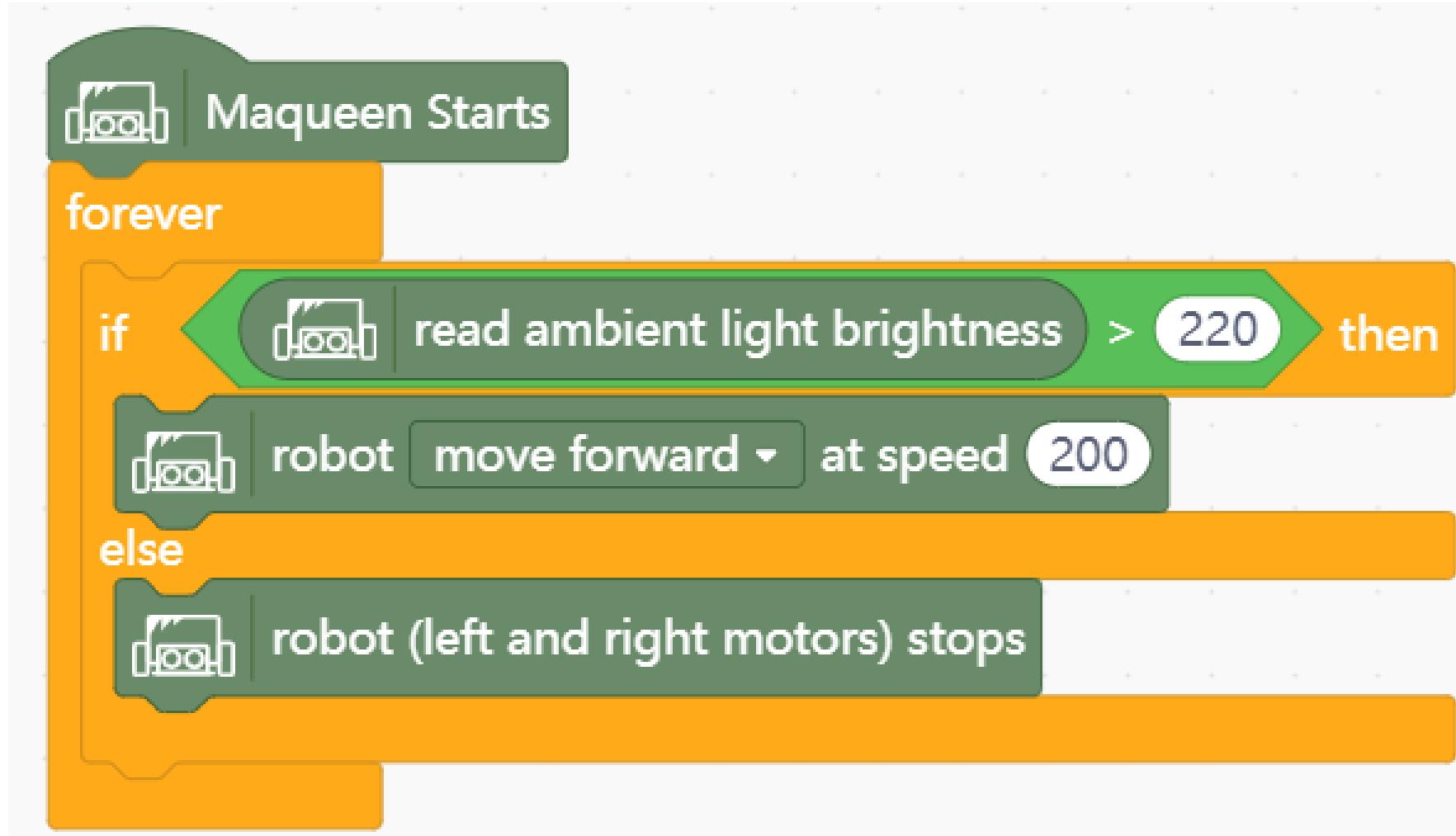
Zadatak:

- Očitajte jačinu osvjetljenja
- Ako je svjetlo jače od 220
 - neka se robot kreće naprijed s
 - RGB svjetla neka svijetle plavom bojom
- Inače
 - zaustavite robota i
 - ugasite RGB svjetla

Naredbe:

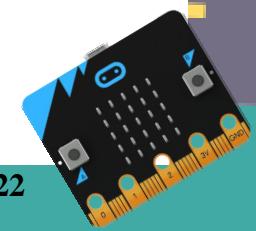


1.



The image shows a Scratch script titled "Maqueen Starts". It begins with a green "when green flag clicked" hat block. This is followed by a yellow "forever" control loop. Inside the loop is an orange "if" control branch. The condition part of the branch contains a green "read ambient light brightness" sensor block, which is compared to the value "220" using a greater than operator. The "then" part of the branch contains a green "robot move forward ▾ at speed [200]" motion block. The "else" part of the branch contains a green "robot (left and right motors) stops" motion block. The entire script is set against a white background with a grid pattern.

```
when green flag clicked
forever
  if [read ambient light brightness > 220] then
    robot move forward ▾ at speed [200]
  else
    robot (left and right motors) stops
end
```



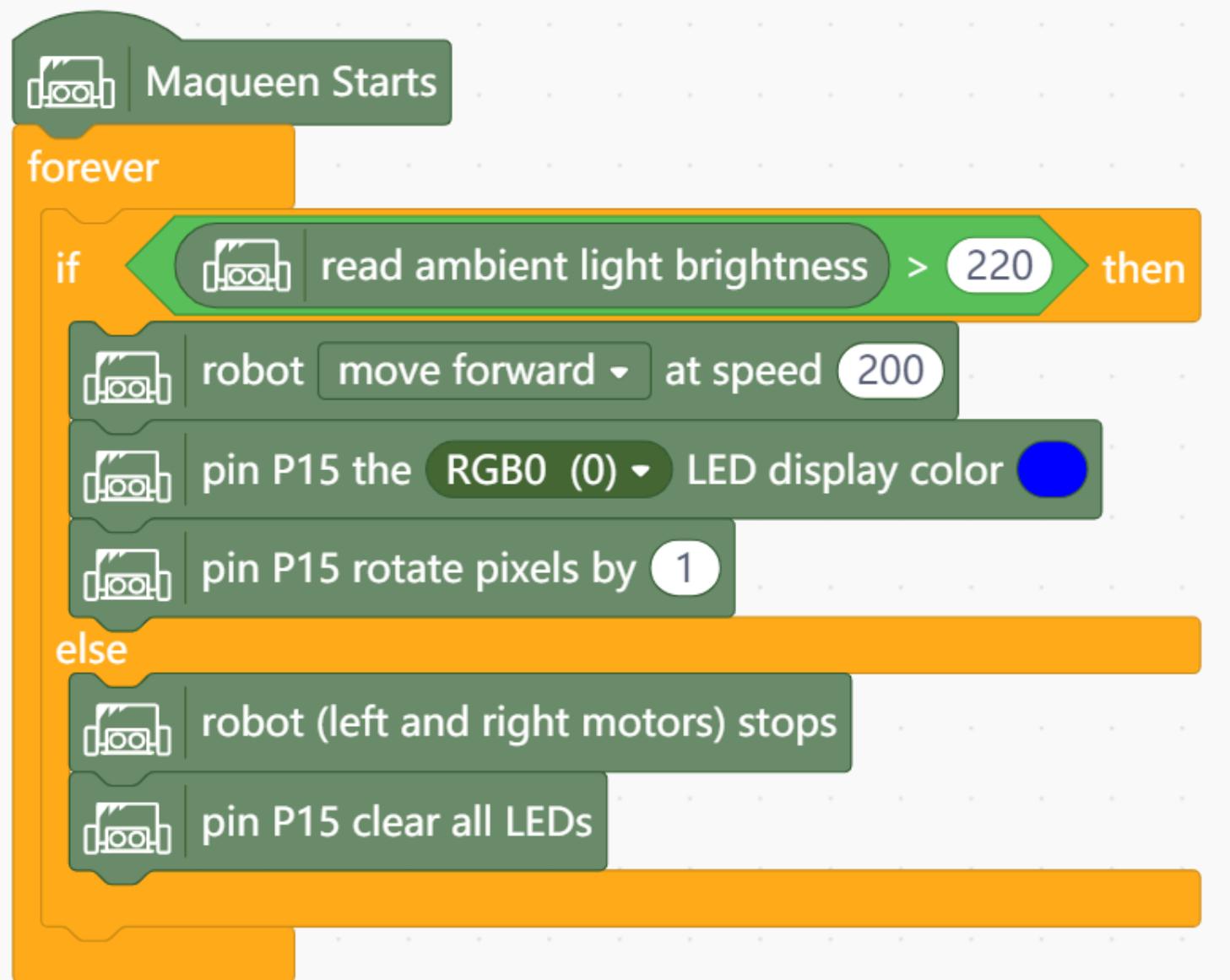
2.

The Scratch script starts with the "Maqueen Starts" hat block. It enters a "forever" loop. Inside the loop, there is an "if" condition: "read ambient light brightness > 220". If true, it executes the "then" block which contains two commands: "robot move forward ▾ at speed 200" and "pin P15 the RGB0 (0) ▾ LED display color blue". If false, it executes the "else" block which contains two commands: "robot (left and right motors) stops" and "pin P15 clear all LEDs".

```
when [Maqueen Starts] hat is pressed
repeat forever
  if [read ambient light brightness > 220] then
    robot move forward ▾ at speed 200
    pin P15 the RGB0 (0) ▾ LED display color blue
  else
    robot (left and right motors) stops
    pin P15 clear all LEDs
end
```



Rješenje



The Scratch script starts with the "Maqueen Starts" hat block. It enters a "forever" loop. Inside the loop, it checks if the ambient light brightness is greater than 220. If true, it executes the "then" block which contains three commands: "robot move forward ▾ at speed 200", "pin P15 the RGB0 (0) ▾ LED display color blue", and "pin P15 rotate pixels by 1". If false, it executes the "else" block which contains two commands: "robot (left and right motors) stops" and "pin P15 clear all LEDs".

```
when [Maqueen Starts] hat is pressed
repeat forever
  if [read ambient light brightness > 220] then
    robot move forward ▾ at speed 200
    pin P15 the RGB0 (0) ▾ LED display color blue
    pin P15 rotate pixels by 1
  else
    robot (left and right motors) stops
    pin P15 clear all LEDs
end
```



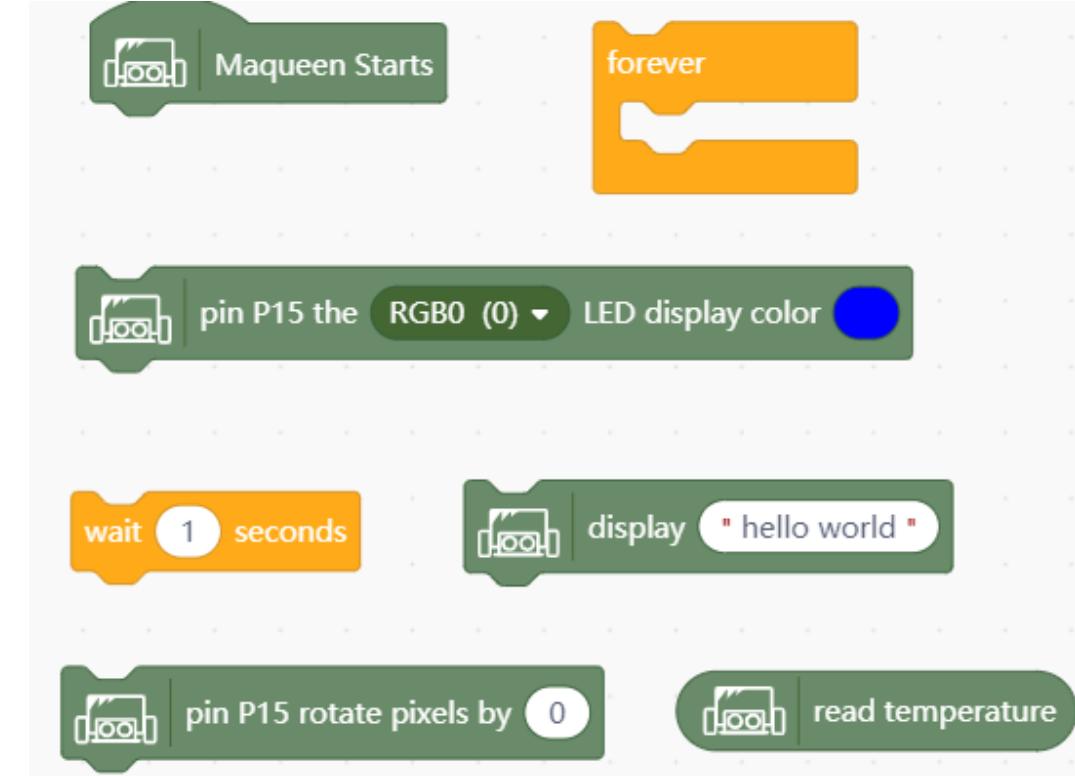
3. Zadatak

Temperatura

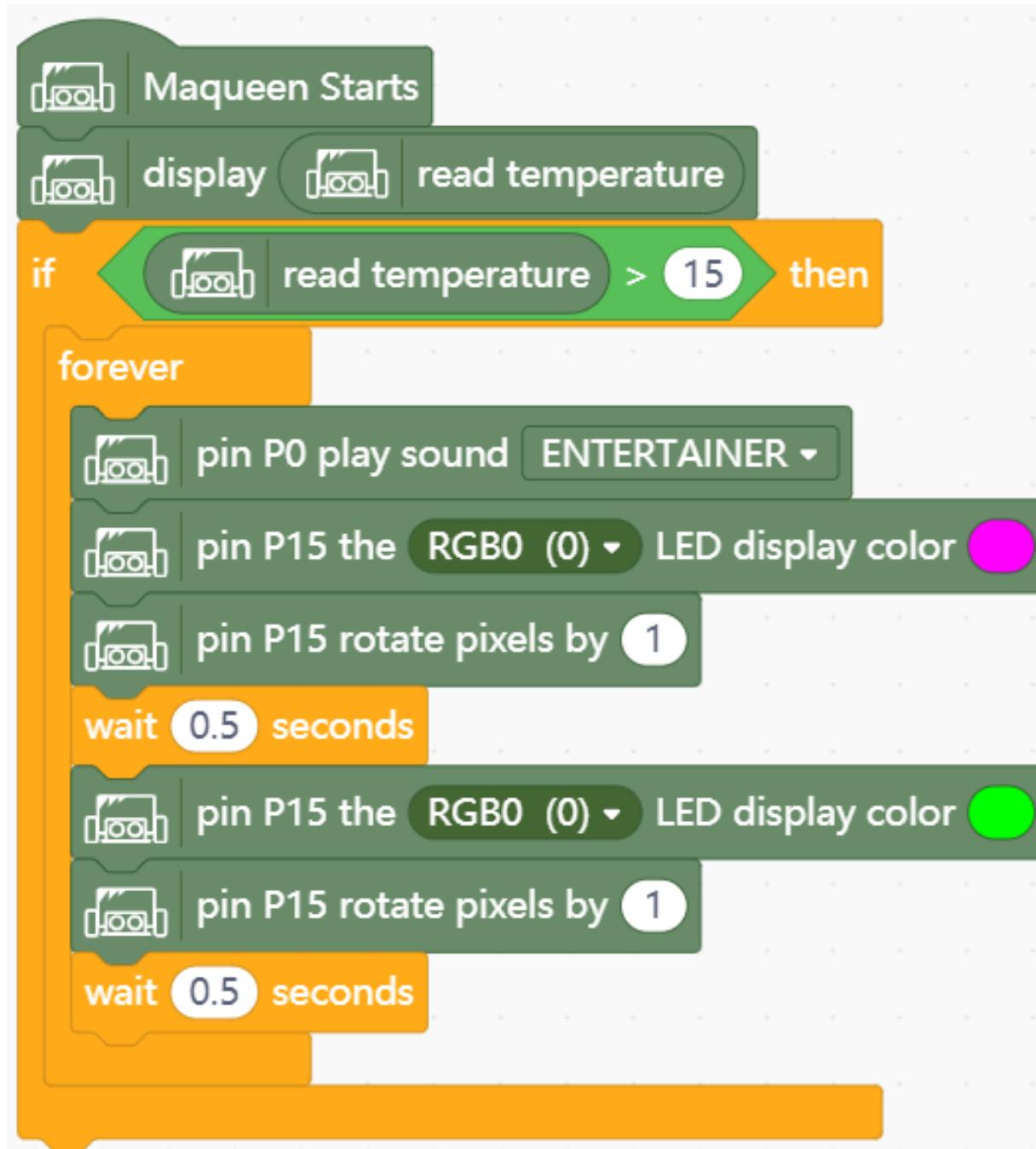
Zadatak:

- Prikažite očitanu temperaturu
- Ako je temperatura > 15 neka robot zauvijek:
 - svira melodiju Entertainer,
 - RGB(0) neka svijetli ljubičastom bojom,
 - rotirajte pixel za 1,
 - pauza 0.5 sek
 - RGB(0) neka svijetli zelenom bojom,
 - rotirajte pixel za 1,
 - pauza 0.5 sek

Naredbe:



Rješenje



The Scratch script starts with the "Maqueen Starts" event. It then checks if the temperature is greater than 15. If true, it enters a forever loop. Inside the loop, it plays a sound named "ENTERTAINER", changes the LED color to pink, rotates the pixels by 1, waits 0.5 seconds, changes the LED color to green, rotates the pixels by 1, and waits another 0.5 seconds.

```
when [Maqueen Starts]
  [display v. read temperature v.]
  if [read temperature > 15] then
    forever
      [pin P0 play sound [ENTERTAINER v.]]
      [pin P15 the [RGB0 (0) v.] LED display color]
      [pin P15 rotate pixels by (1)]
      [wait (0.5) seconds]
      [pin P15 the [RGB0 (0) v.] LED display color]
      [pin P15 rotate pixels by (1)]
      [wait (0.5) seconds]
```



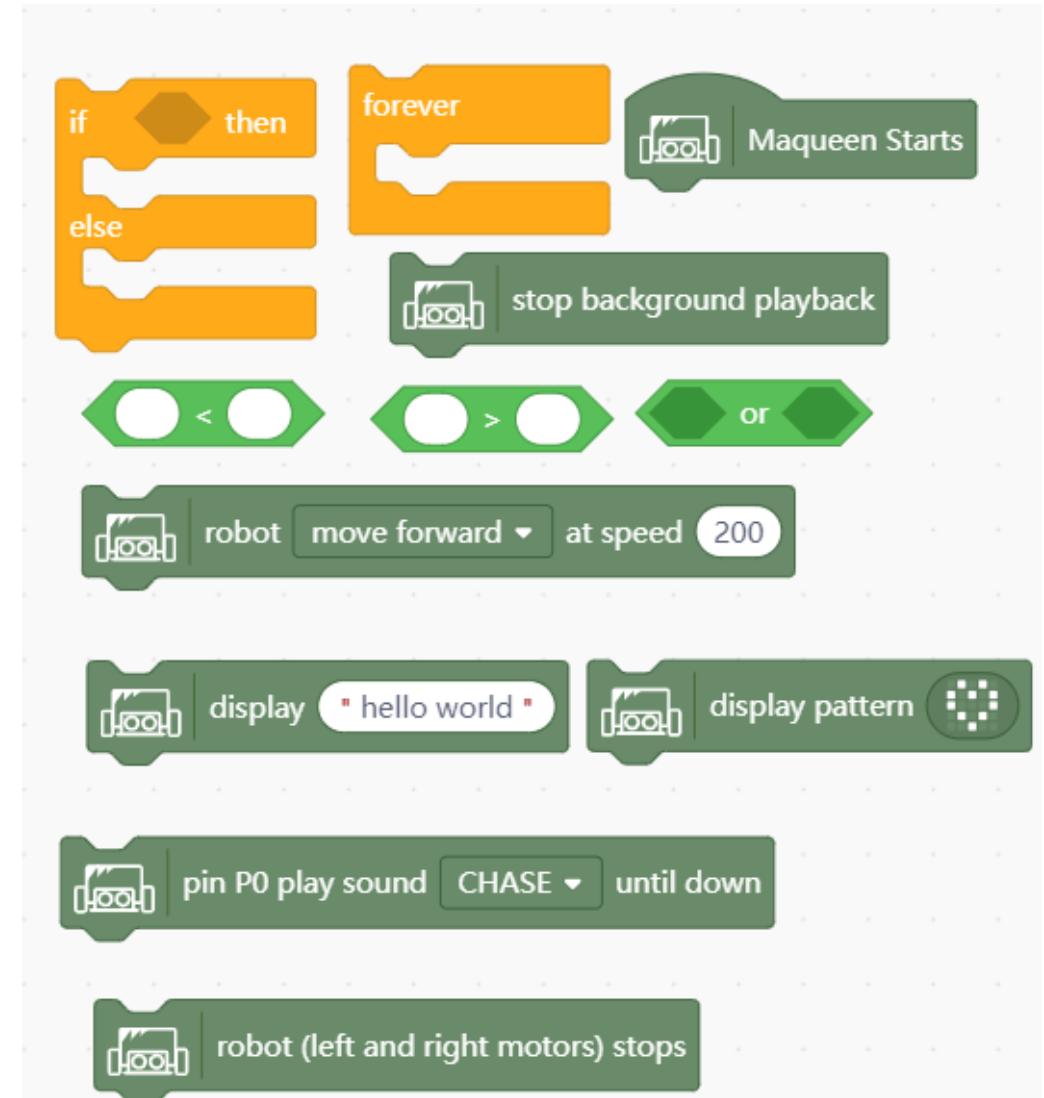
4. Zadatak

Lovac

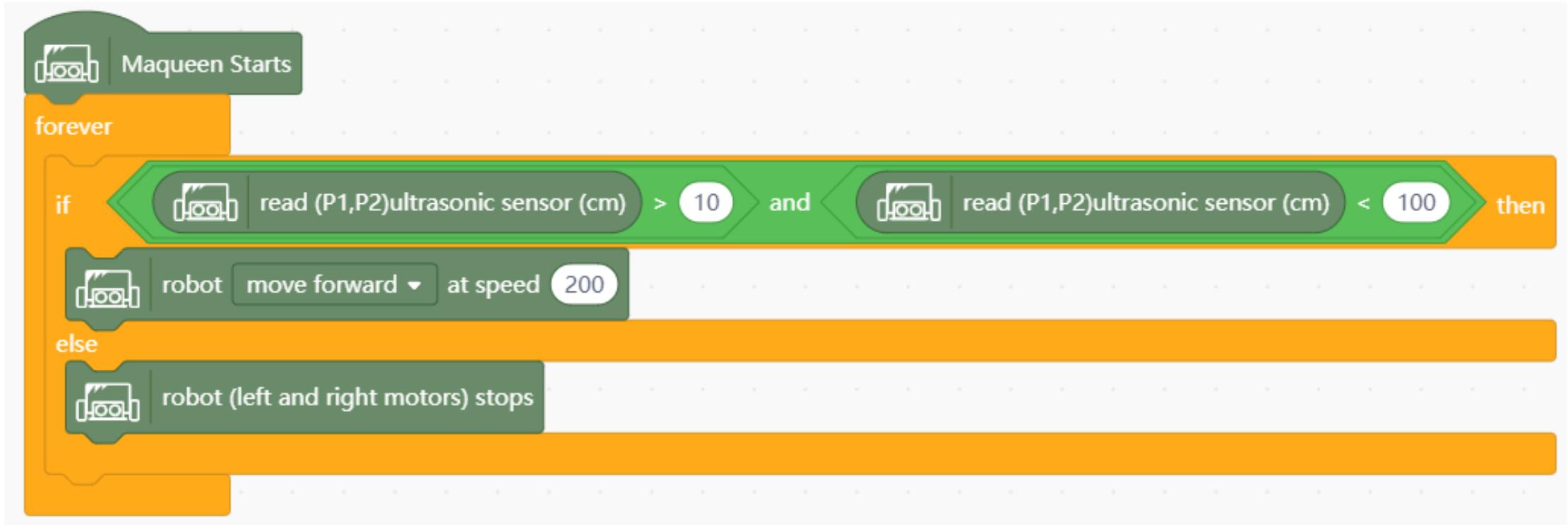
Zadatak:

- Robot stalno očitava ultrazvučni senzor.
- Ako su očitane vrijednosti senzora u rasponu od 10 do 100
 - Robot se kreće naprijed brzinom 200
 - Svira glazbu CHASE i
 - Ispisuje Čekaj me
- Inače
 - Zaustavlja motore
 - Zaustavlja glazbu
 - I prikazuje tužno lice

Naredbe:



1.



Maqueen Starts

forever

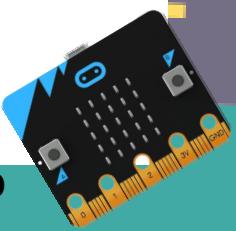
if [read (P1,P2) ultrasonic sensor (cm)] > [10] and [read (P1,P2) ultrasonic sensor (cm)] < [100] then

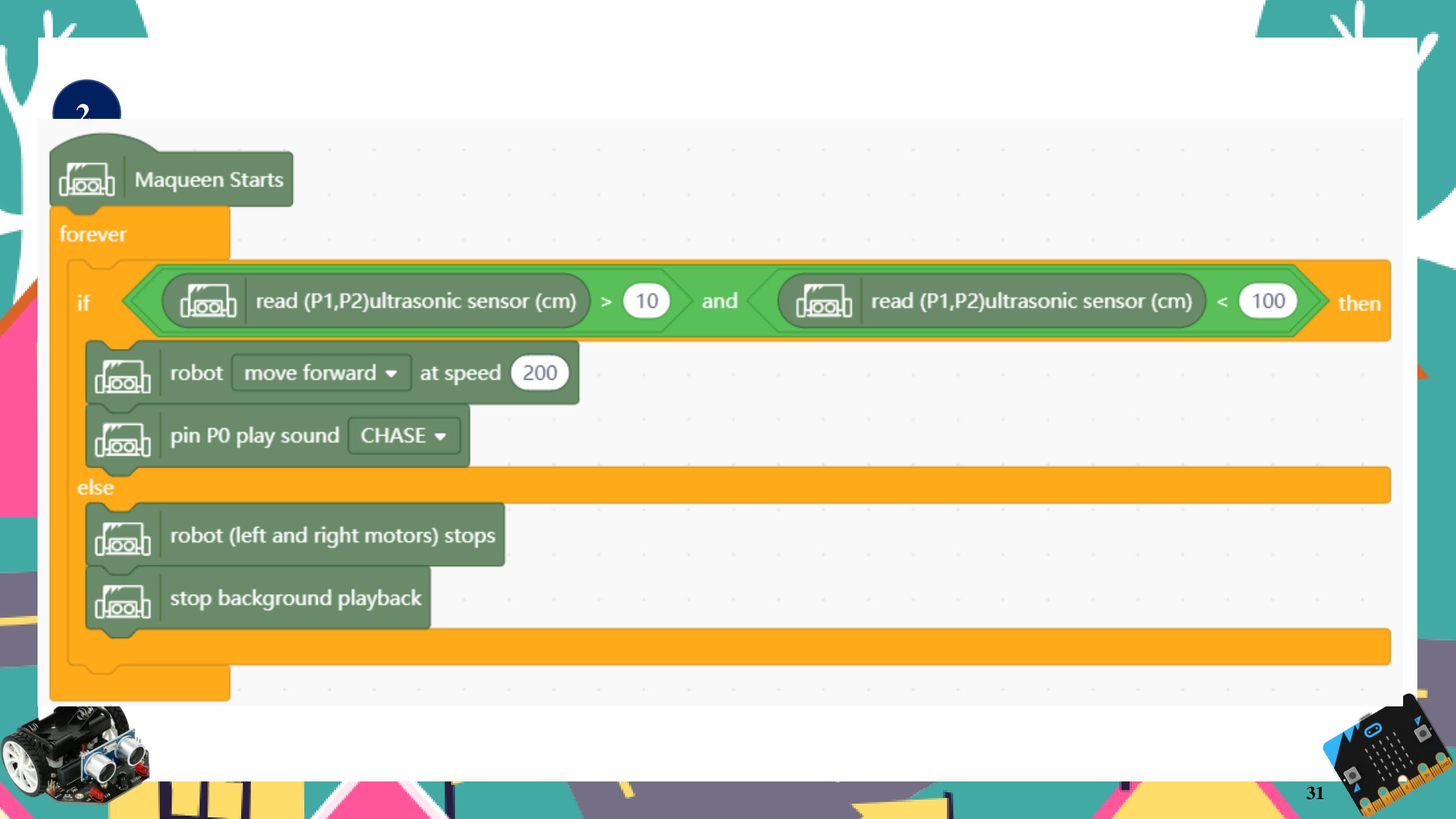
- [robot move forward v at speed 200]

else

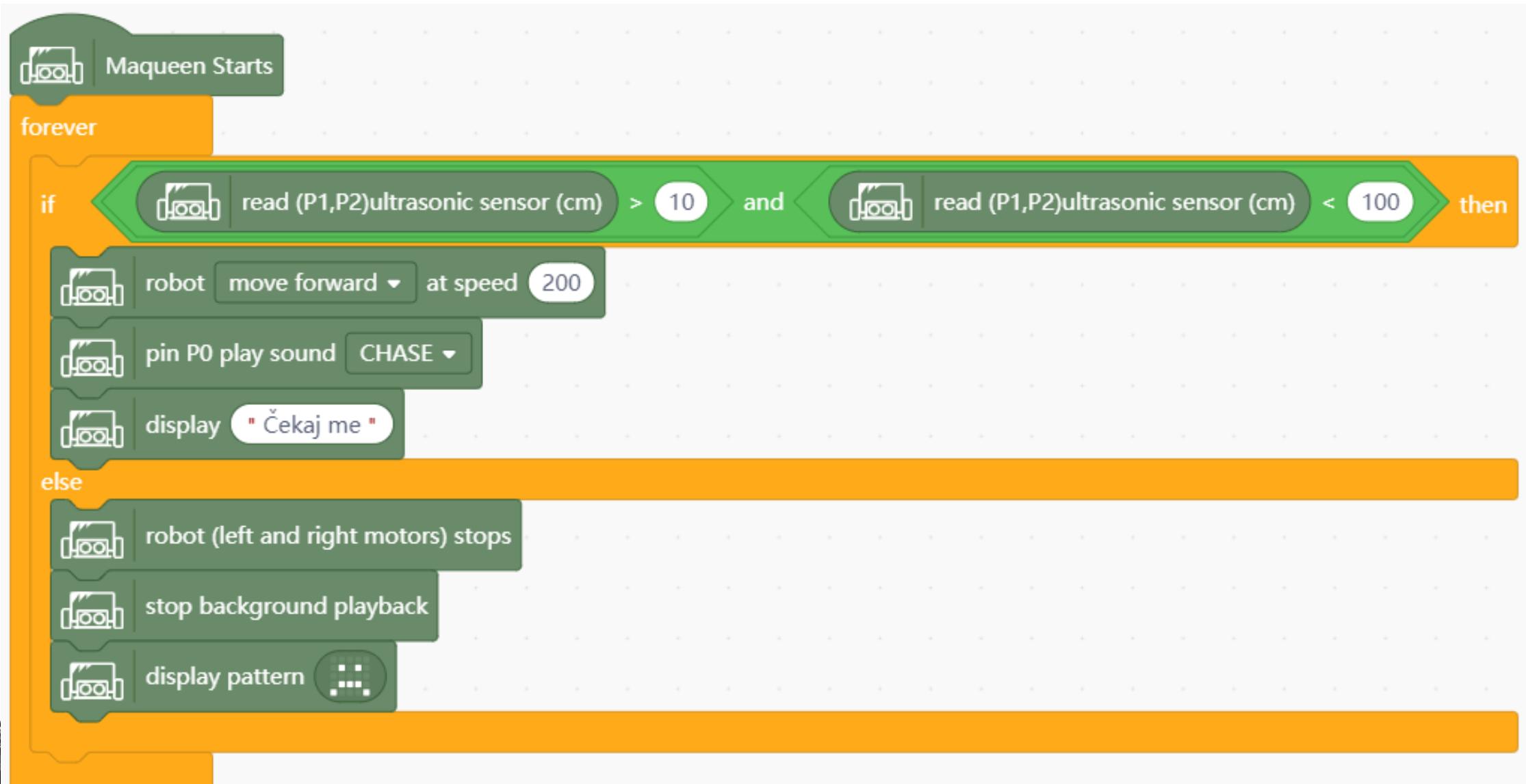
- [robot (left and right motors) stops]

This Scratch script for a Maqueen robot starts with the "Maqueen Starts" hat. It enters a "forever" loop. Inside the loop, there is an "if" condition that checks two ultrasonic sensor readings. If both readings are greater than 10 cm and less than 100 cm, the robot moves forward at a speed of 200. If either reading is outside this range, the robot stops.





Rješenje



The Scratch script starts with the "Maqueen Starts" hat block. It enters a "forever" loop. Inside the loop, it checks two conditions using the ultrasonic sensor (P1, P2):

- If the distance is greater than 10 cm and less than 100 cm, the robot moves forward at speed 200, plays a "CHASE" sound, and displays the text "Čekaj me".
- If the distance is not within this range, the robot stops, stops background playback, and displays a pattern.

5. Zadatak

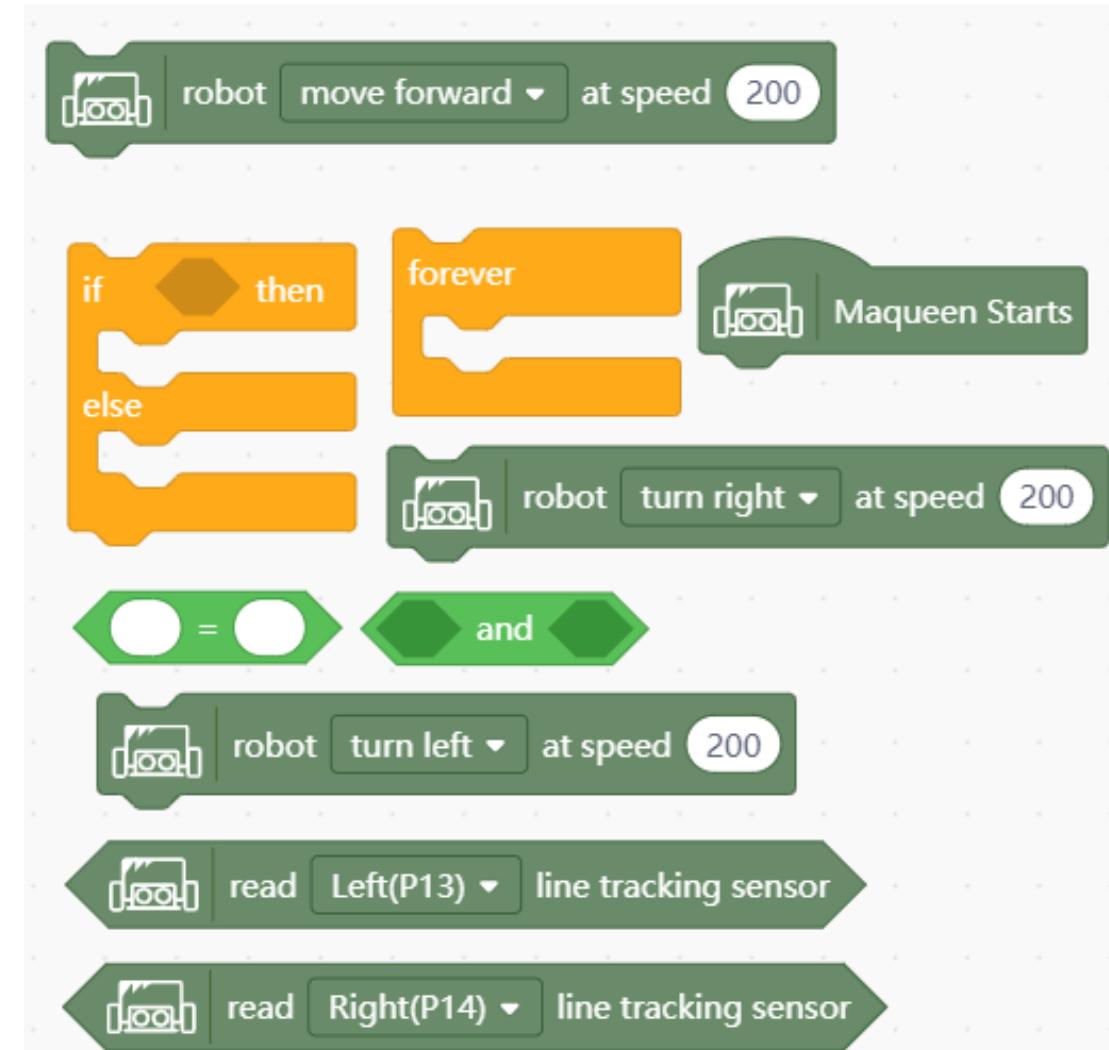
Vožnja cestom

Zadatak:

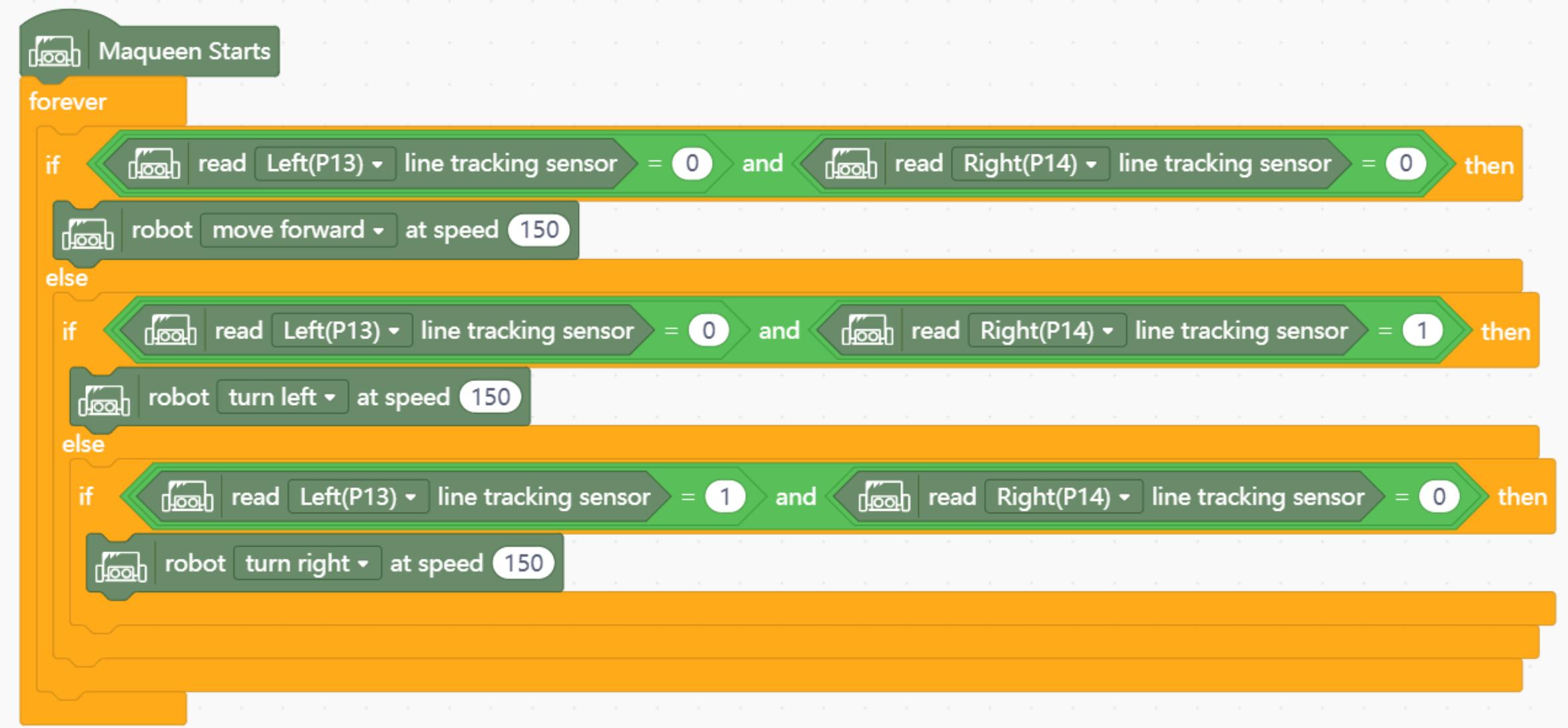
Izradite program u kojem robot vozi po liniji..

- Robot stalno očitava senzor za praćenje linije.
- Ako desni senzor izđe sa linije robot neka skrene lijevo
- Ako lijevi senzor izđe sa linije robot neka skrene desno
- Ako su oba senzora iznad linije robot neka vozi ravno

Naredbe:



Rješenje



The Scratch script starts with the "Maqueen Starts" hat block. It enters a "forever" loop. Inside the loop, it checks two conditions using the "if" block: "read Left(P13) line tracking sensor = 0 and read Right(P14) line tracking sensor = 0". If both conditions are true, it executes the "robot move forward at speed 150" command. If either condition is false, it enters an "else" block. Inside the "else" block, it first checks "read Left(P13) line tracking sensor = 0 and read Right(P14) line tracking sensor = 1". If true, it executes "robot turn left at speed 150". If false, it checks "read Left(P13) line tracking sensor = 1 and read Right(P14) line tracking sensor = 0". If true, it executes "robot turn right at speed 150".

```
when Maqueen Starts
forever
  if [read Left(P13) line tracking sensor = 0] and [read Right(P14) line tracking sensor = 0]
    then
      robot move forward v [150]
    else
      if [read Left(P13) line tracking sensor = 0] and [read Right(P14) line tracking sensor = 1]
        then
          robot turn left v [150]
        else
          if [read Left(P13) line tracking sensor = 1] and [read Right(P14) line tracking sensor = 0]
            then
              robot turn right v [150]
```



Pitanja?

Valentina Blašković



valentina.blaskovic@skole.hr

Daniela Orlović



daniela.orlovic@skole.hr