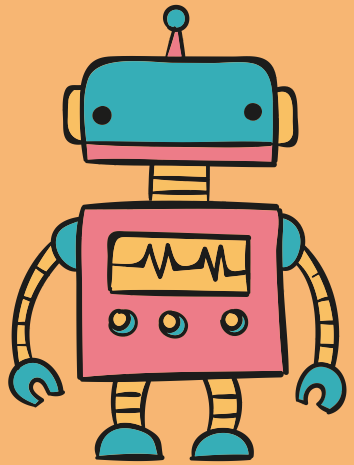
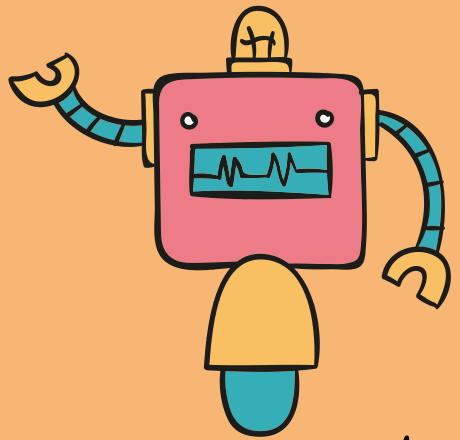
Roboți

MBOT

Magia roboților mbot

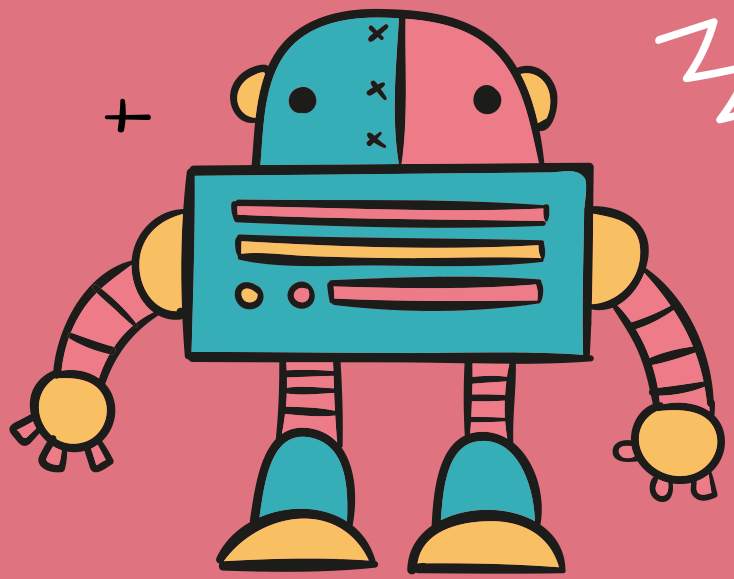


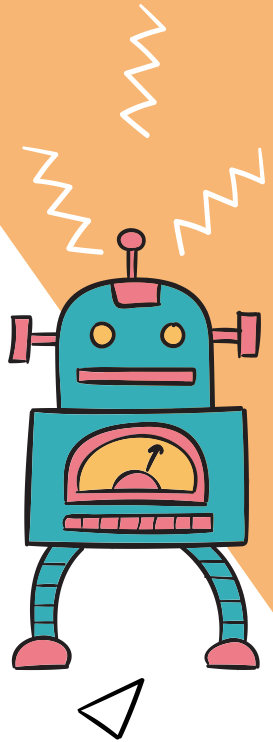
Elevi: Tomescu Vlad Costin, Trifan Dacian
Profesor indrumator: Horlescu Gabriela Brandusa
Clasa: 11C
Colegiul Tehnic Gheorghe Cartianu



Despre mBot

MBOT este un robot educativ de la Makeblock, proiectat pentru a introduce copiii în lumea programării și a roboticii. Acesta este un robot mic și compact, alimentat de o baterie litiu-ion, echipat cu senzori și componente electronice care permit controlul său prin intermediul unui microcontroler Arduino.





01 Ambulanța

Cu ajutorul lui mBot am creat un robot ce simulează o ambulanță

02 Senzor Culoare

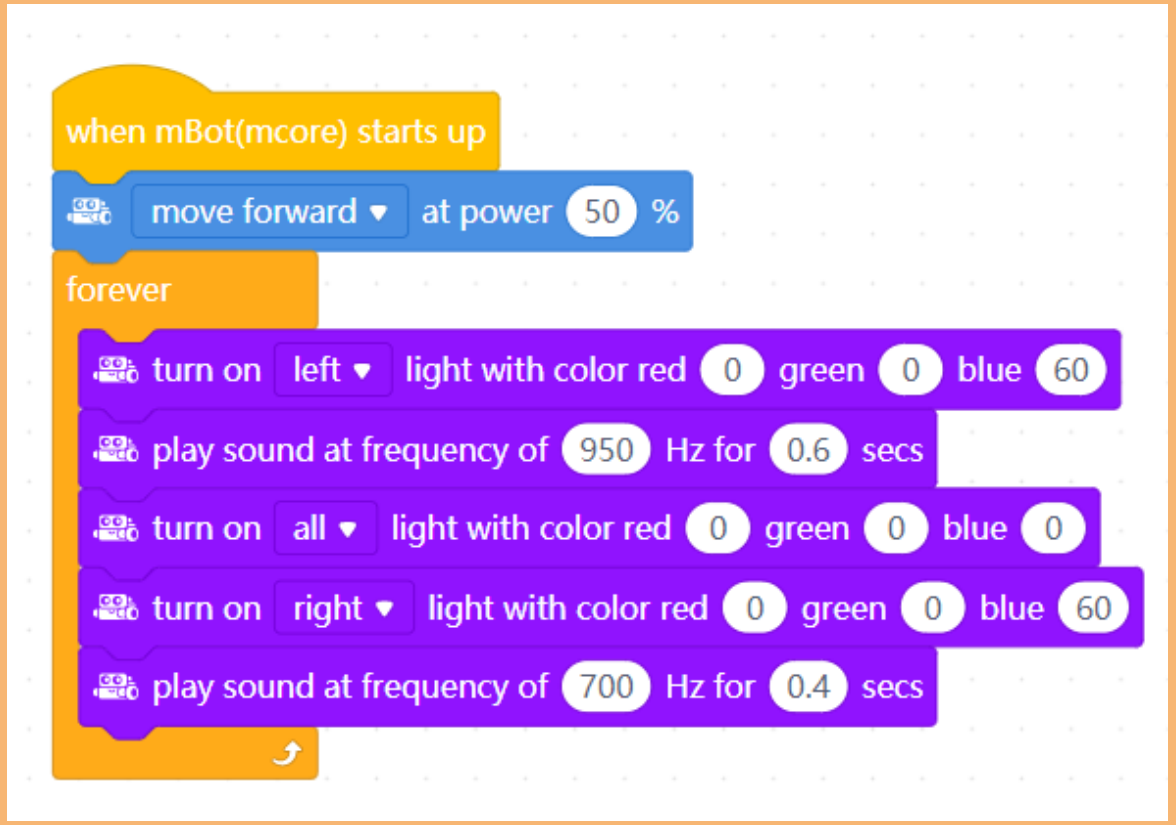
Cu ajutorul senzorilor de culoare am creat un robot ce urmareste culoarea neagră

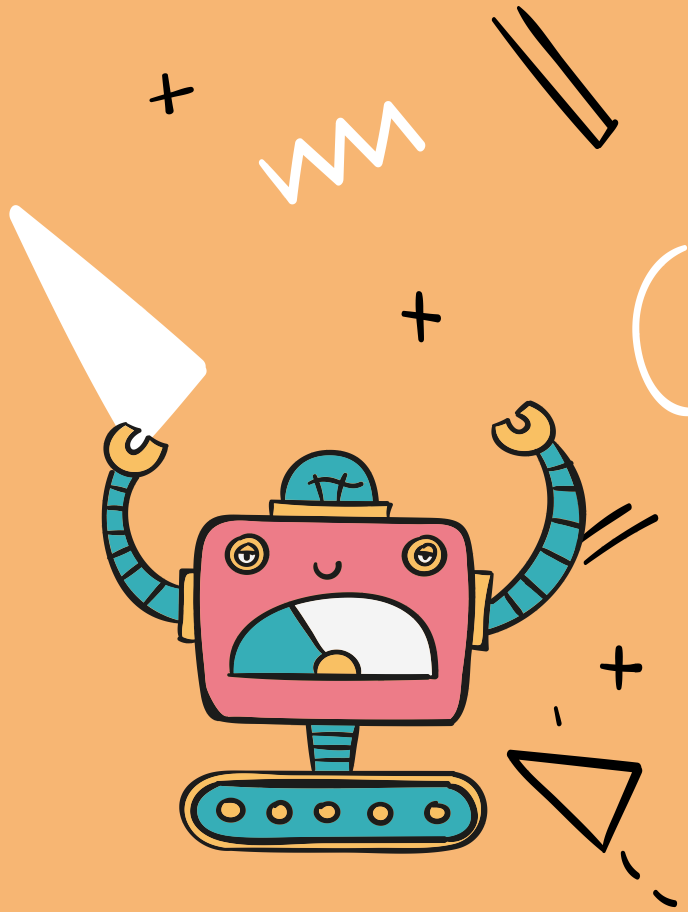
03 Masină

Cu ajutorul lui mBot am putut simula o masină care este controlată de o telecomandă si simulează schimbatorul de viteze

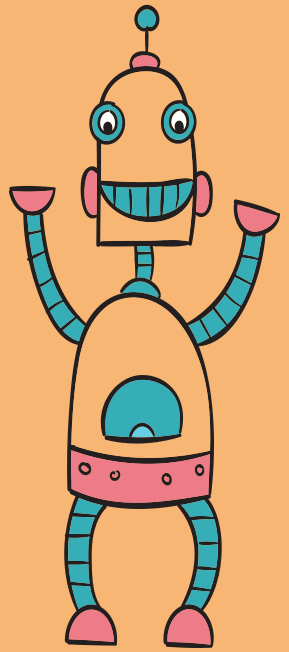
04 Obstacole

Cu ajutorul senzorilor ultrasonic robotul poate detecta obstacole.


when mBot(mcore) starts up
move forward at power 50 %
forever
turn on left light with color red 0 green 0 blue 60
play sound at frequency of 950 Hz for 0.6 secs
turn on all light with color red 0 green 0 blue 0
turn on right light with color red 0 green 0 blue 60
play sound at frequency of 700 Hz for 0.4 secs



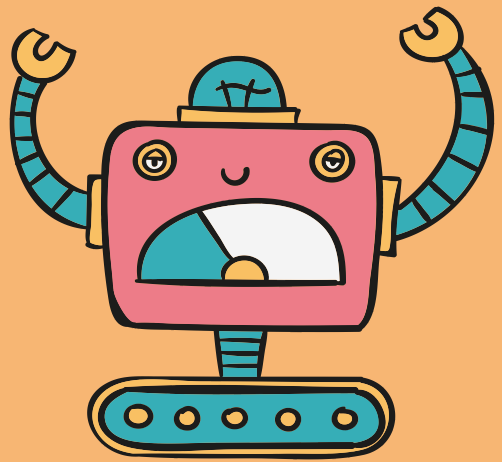
Ambulanța



Ambulanța

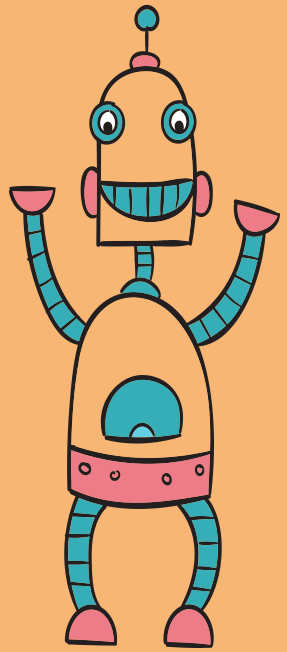
Cod Arduino

```
#include <MeMCore.h>
#include <Arduino.h>
#include <Wire.h>
#include <SoftwareSerial.h>

MeDCMotor motor_9(9);
MeDCMotor motor_10(10);
MeRGBLed rgbled_7(7, 2);
MeBuzzer buzzer;

void move(int direction, int speed) {
  int leftSpeed = 0;
  int rightSpeed = 0;
  if(direction == 1) {
    leftSpeed = speed;
    rightSpeed = speed;
  } else if(direction == 2) {
    leftSpeed = -speed;
    rightSpeed = -speed;
  } else if(direction == 3) {
    leftSpeed = -speed;
    rightSpeed = speed;
  } else if(direction == 4) {
    leftSpeed = speed;
    rightSpeed = -speed;
  }
  motor_9.run((9) == M1 ? -(leftSpeed) : (leftSpeed));
  motor_10.run((10) == M1 ? -(rightSpeed) :
(rightSpeed));
}

void _delay(float seconds) {
  long endTime = millis() + seconds * 1000;
  while(millis() < endTime) _loop();
}

void setup() {
  rgbled_7.fillPixelsBak(0, 2, 1);

  move(1, 50 / 100.0 * 255);
  while(1) {

      rgbled_7.setColor(2, 0, 0, 60);
      rgbled_7.show();

      buzzer.tone(950, 0.6 * 1000);

      rgbled_7.setColor(0, 0, 0, 0);
      rgbled_7.show();

      rgbled_7.setColor(1, 0, 0, 60);
      rgbled_7.show();

      buzzer.tone(700, 0.4 * 1000);

      _loop();
  }

}

void _loop() {
}

void loop() {
  _loop();
}
```



Senzor Culoare

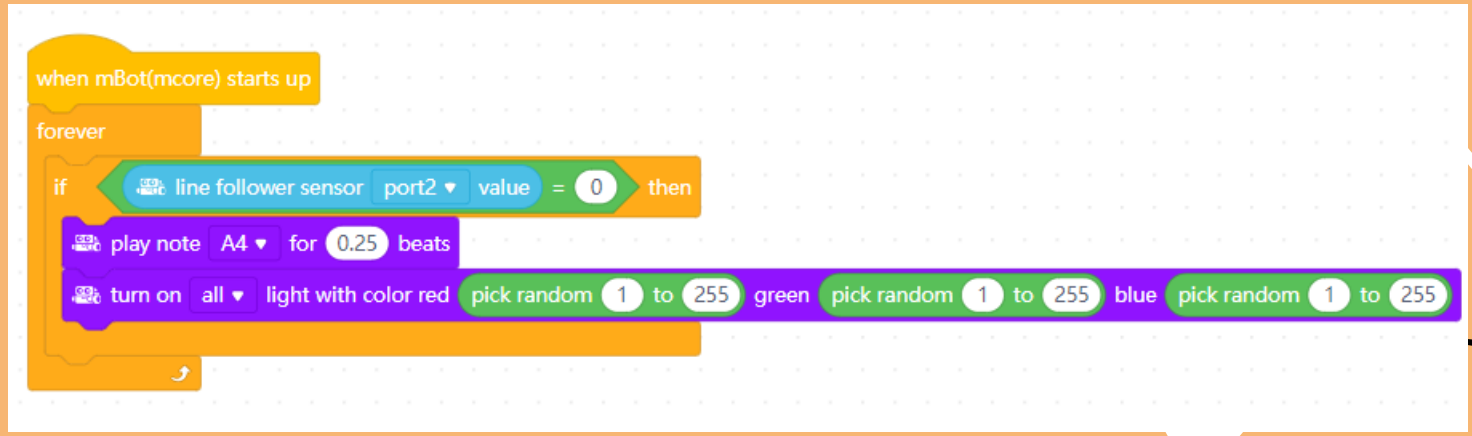
```
when mBot(mcore) starts up
wait until [when on-board button] pressed ?
forever
  if [line follower sensor] port3 value = 0 then
    [move forward] at power 80 %
  if [line follower sensor] port3 value = 1 then
    DC motor motor port1 anticlockwise rotates at power 0 %
    DC motor motor port2 clockwise rotates at power 50 %
  if [line follower sensor] port3 value = 2 then
    DC motor motor port1 anticlockwise rotates at power 50 %
    DC motor motor port2 clockwise rotates at power 0 %
  if [line follower sensor] port3 value = 3 then
    [move backward] at power 40 %
```



Senzor Culoare

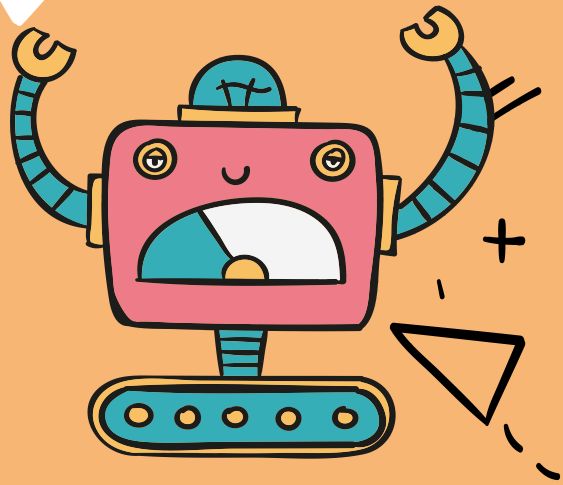
Cod Arduino

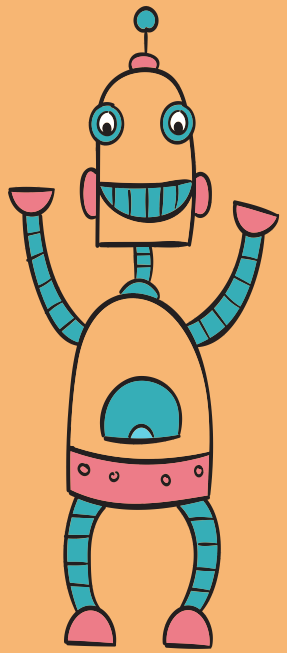
```
#include <MeMCore.h>
#include <Arduino.h>
#include <Wire.h>
#include <SoftwareSerial.h>

MeLineFollower linefollower_3(3);
MeDCMotor motor_9(9);
MeDCMotor motor_10(10);

void move(int direction, int speed) {
  int leftSpeed = 0;
  int rightSpeed = 0;
  if(direction == 1) {
    leftSpeed = speed;
    rightSpeed = speed;
  } else if(direction == 2) {
    leftSpeed = -speed;
    rightSpeed = -speed;
  } else if(direction == 3) {
    leftSpeed = -speed;
    rightSpeed = speed;
  } else if(direction == 4) {
    leftSpeed = speed;
    rightSpeed = -speed;
  }
  motor_9.run((9) == M1 ? -(leftSpeed) : (leftSpeed));
  motor_10.run((10) == M1 ? -(rightSpeed) :
(rightSpeed));
}

void _delay(float seconds) {
  long endTime = millis() + seconds * 1000;
  while(millis() < endTime) _loop();
}

void setup() {
  pinMode(A7, INPUT);
  while(!((0 ^ (analogRead(A7) > 10 ? 0 : 1))))
  {
    _loop();
  }
  while(1) {
      if(linefollower_3.readSensors() == 0.000000){

          move(1, 80 / 100.0 * 255);

      }
      if(linefollower_3.readSensors() == 1.000000){

          motor_9.run(-1*0/100.0*255);

          motor_10.run(1*50/100.0*255);

      }
      if(linefollower_3.readSensors() == 2.000000){

          motor_9.run(-1*50/100.0*255);

          motor_10.run(1*0/100.0*255);

      }
      if(linefollower_3.readSensors() == 3.000000){

          move(2, 40 / 100.0 * 255);

      }

      _loop();
  }

}

void _loop() {
}

void loop() {
  _loop();
}
```



Lasa-mă Jos!

Acest cod este făcut in distracție și are scopul de a face robotul sa țipe când este ridicat de pe jos

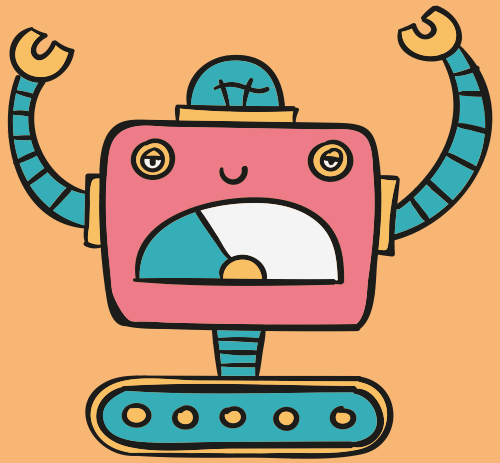




Cod Arduino

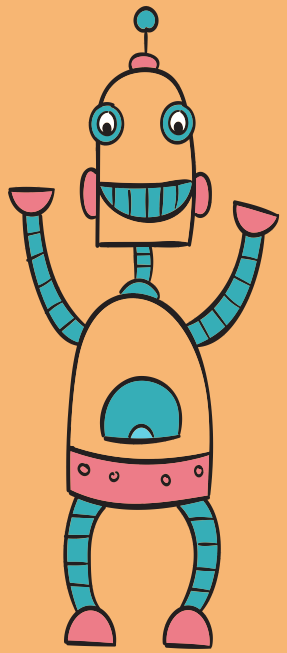
```
#include <MeMCore.h>
#include <Arduino.h>
#include <Wire.h>
#include <SoftwareSerial.h>

MeLineFollower linefollower_2(2);
MeBuzzer buzzer;
MeRGBLed rgbled_7(7, 2);

void _delay(float seconds) {
  long endTime = millis() + seconds * 1000;
  while(millis() < endTime) _loop();
}

void setup() {
  rgbled_7.fillPixelsBak(0, 2, 1);
  while(1) {
      if(linefollower_2.readSensors() == 0.000000){

          buzzer.tone(440, 0.25 * 1000);
          _delay(0.02);

          rgbled_7.setColor(0, random(1, 255 +1), random(1, 255 +1), random(1, 255
+1));      rgbled_7.show();

      }

      _loop();
  }

}

void _loop() {
}

void loop() {
  _loop();
}
```

Lasa-mă Jos!



Masină

```
when mBot(mcore) starts up
LED all shows color for 1 secs
forever
  if IR remote F pressed? then
    set b to 1
  else
    if IR remote 1 pressed? then
      set viteza to 50
      set b to 0
    else
      if IR remote 2 pressed? then
        set viteza to 200
        set b to 0
      else
        if IR remote 3 pressed? then
          set viteza to 300
          set b to 0
        else
          if IR remote up pressed? then
            if b = 1 then
              move backward at power 50 %
            else
              move forward at power viteza %
          else
            if IR remote left pressed? then
              turn left at power viteza %
            else
              if IR remote right pressed? then
                turn right at power viteza %
              else
                stop moving
                if IR remote set pressed? then
                  play note B7 for 0.5 beats
                  LED all shows color for 0.5 secs
```

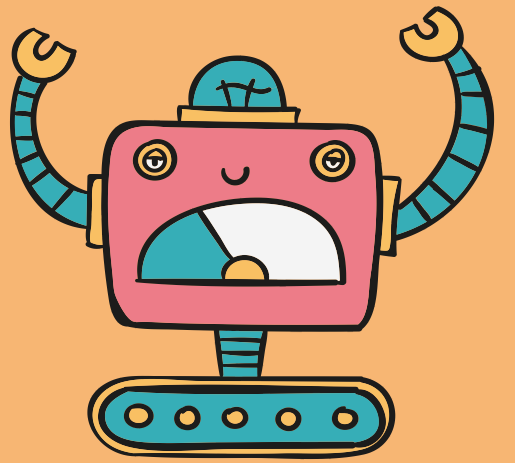


Masină

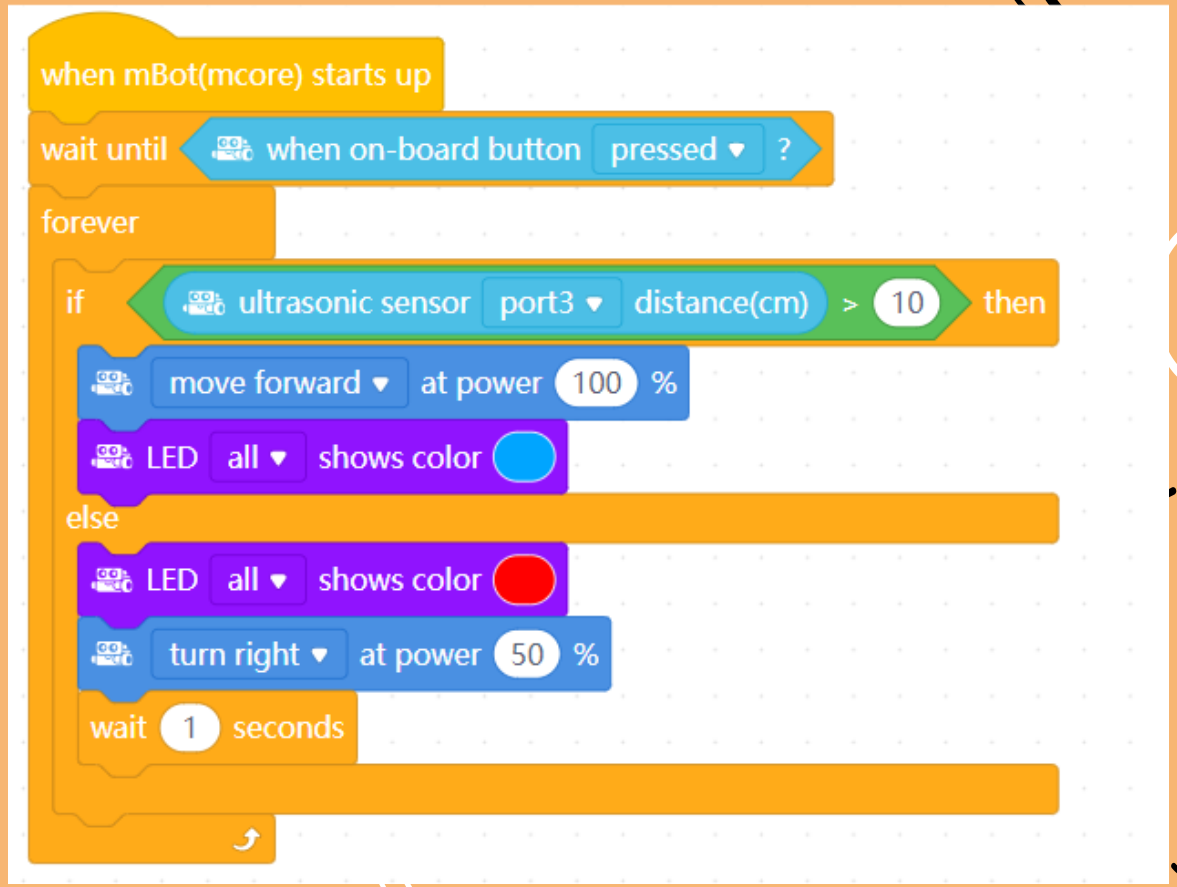
+

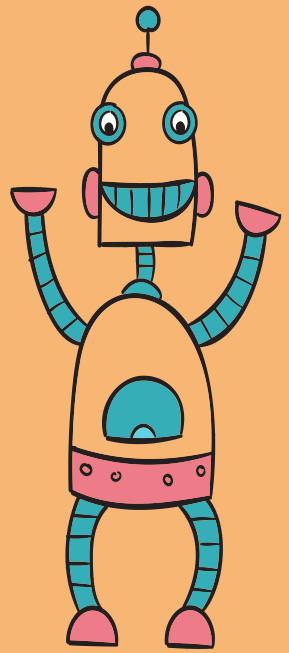
Cod Arduino

```
#include <MyMCore.h>
#include <Arduino.h>
#include <Wire.h>
#include <SoftwareSerial.h>

MyRGBLed rgbled_7(7, 23);
MyIR ir;
MyDCMotor motor_9(9);
MyDCMotor motor_10(10);
MyBuzzer buzzer;

float viteza = 0;
float b = 0;

void move(int direction, int speed) {
  int leftSpeed = 0;
  int rightSpeed = 0;
  if(direction == 1) {
    leftSpeed = speed;
    rightSpeed = speed;
  } else if(direction == 2) {
    leftSpeed = -speed;
    rightSpeed = -speed;
  } else if(direction == 3) {
    leftSpeed = -speed;
    rightSpeed = speed;
  } else if(direction == 4) {
    leftSpeed = speed;
    rightSpeed = -speed;
  }
  motor_9.run((9) == M1 ? -(leftSpeed) : (leftSpeed));
  motor_10.run((10) == M1 ? -(rightSpeed) : (rightSpeed));
}

void _delay(float seconds) {
  long endTime = millis() + seconds * 1000;
  while(millis() < endTime) _loop();
}

void setup() {
  rgbled_7.fillPixelsBak(0, 2, 1);
  ir.begin();

  rgbled_7.setColor(0,255,0,0);
  rgbled_7.show();
  _delay(1);
  rgbled_7.setColor(0,0,0,0);
  rgbled_7.show();
  while(1) {
    if(ir.keyPressed(13)){
      b = 1;

    }else{
      if(ir.keyPressed(12)){
        viteza = 50;
        b = 0;

      }else{
        if(ir.keyPressed(24)){
          viteza = 200;
          b = 0;

        }else{
          if(ir.keyPressed(94)){
            viteza = 300;
            b = 0;

          }else{
            if(ir.keyPressed(64)){
              if(b == 1.000000){

                move(2, 50 / 100.0 * 255);

              }else{

                move(1, viteza / 100.0 * 255);

              }

            }else{
              if(ir.keyPressed(7)){

                move(3, viteza / 100.0 * 255);

              }else{
                if(ir.keyPressed(9)){

                  move(4, viteza / 100.0 * 255);

                }else{
                  motor_9.run(0);
                  motor_10.run(0);
                  if(ir.keyPressed(21)){

                    buzzer.tone(3951, 0.5 * 1000);
                    _delay(0.01);


rgbled_7.setColor(0,0,255,200);       rgbled_7.show();
                                      _delay(0.1);
                                      rgbled_7.setColor(0,0,0,0);
                                      rgbled_7.show();

                  }

                }

              }

            }

          }

        }

      }

    }
    _loop();
  }
}

void _loop() {
  ir.loop();
}

void loop() {
  _loop();
}
```



Obstacole


when mBot(mcore) starts up
wait until when on-board button pressed ?
forever
if ultrasonic sensor port3 distance(cm) > 10 then
move forward at power 100 %
LED all shows color
else
LED all shows color
turn right at power 50 %
wait 1 seconds



Obstacole

Cod Arduino

```
#include <MeMCore.h>
#include <Arduino.h>
#include <Wire.h>
#include <SoftwareSerial.h>

MeUltrasonicSensor ultrasonic_3(3);
MeDCMotor motor_9(9);
MeDCMotor motor_10(10);
MeRGBLed rgbled_7(7, 2);

void move(int direction, int speed) {
  int leftSpeed = 0;
  int rightSpeed = 0;
  if(direction == 1) {
    leftSpeed = speed;
    rightSpeed = speed;
  } else if(direction == 2) {
    leftSpeed = -speed;
    rightSpeed = -speed;
  } else if(direction == 3) {
    leftSpeed = -speed;
    rightSpeed = speed;
  } else if(direction == 4) {
    leftSpeed = speed;
    rightSpeed = -speed;
  }
  motor_9.run((9) == M1 ? -(leftSpeed) : (leftSpeed));
  motor_10.run((10) == M1 ? -(rightSpeed) :
(rightSpeed));
}

void _delay(float seconds) {
  long endTime = millis() + seconds * 1000;
  while(millis() < endTime) _loop();
}

void setup() {
  pinMode(A7, INPUT);
  rgbled_7.fillPixelsBak(0, 2, 1);
  while(!((0 ^ (analogRead(A7) > 10 ? 0 : 1))))
  {
    _loop();
  }
  while(1) {
      if(ultrasonic_3.distanceCm() > 10){

          move(1, 100 / 100.0 * 255);

          rgbled_7.setColor(0,0,165,255);
          rgbled_7.show();

      }else{

          rgbled_7.setColor(0,255,0,0);
          rgbled_7.show();

          move(4, 50 / 100.0 * 255);
          _delay(1);

      }

      _loop();
  }

}

void _loop() {
}

void loop() {
  _loop();
}
```

"Robotica este arta de a crea inteligența artificială prin intermediul mecanismelor."

—Rodney Brooks