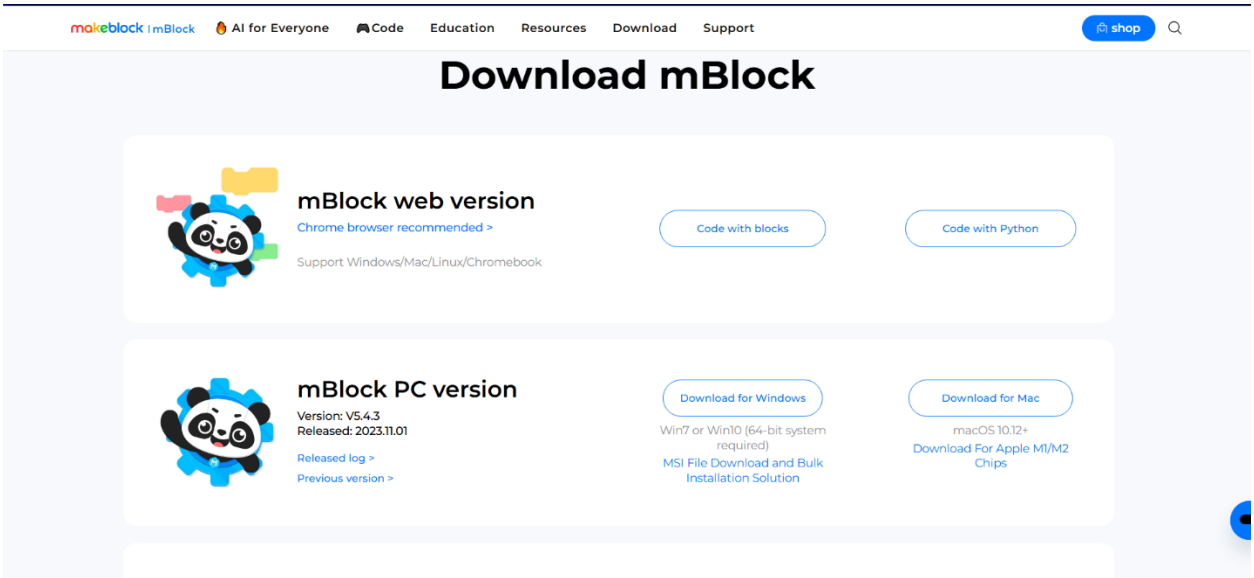
mBot Adventures:

Demo Instructions

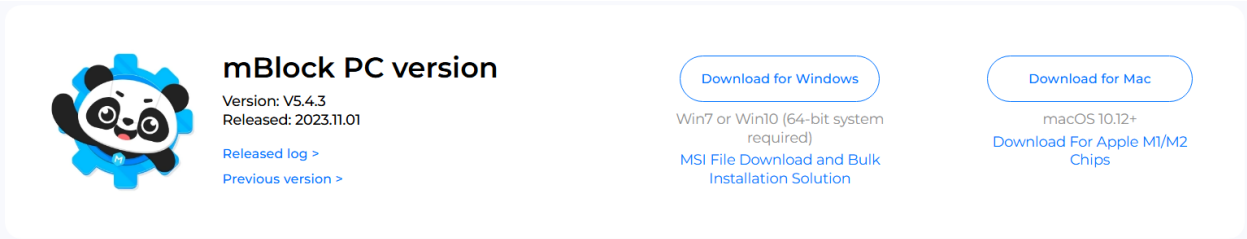
To install the program to use the mBot mega you must go to the website:

https://mblock.cc/pages/downloads

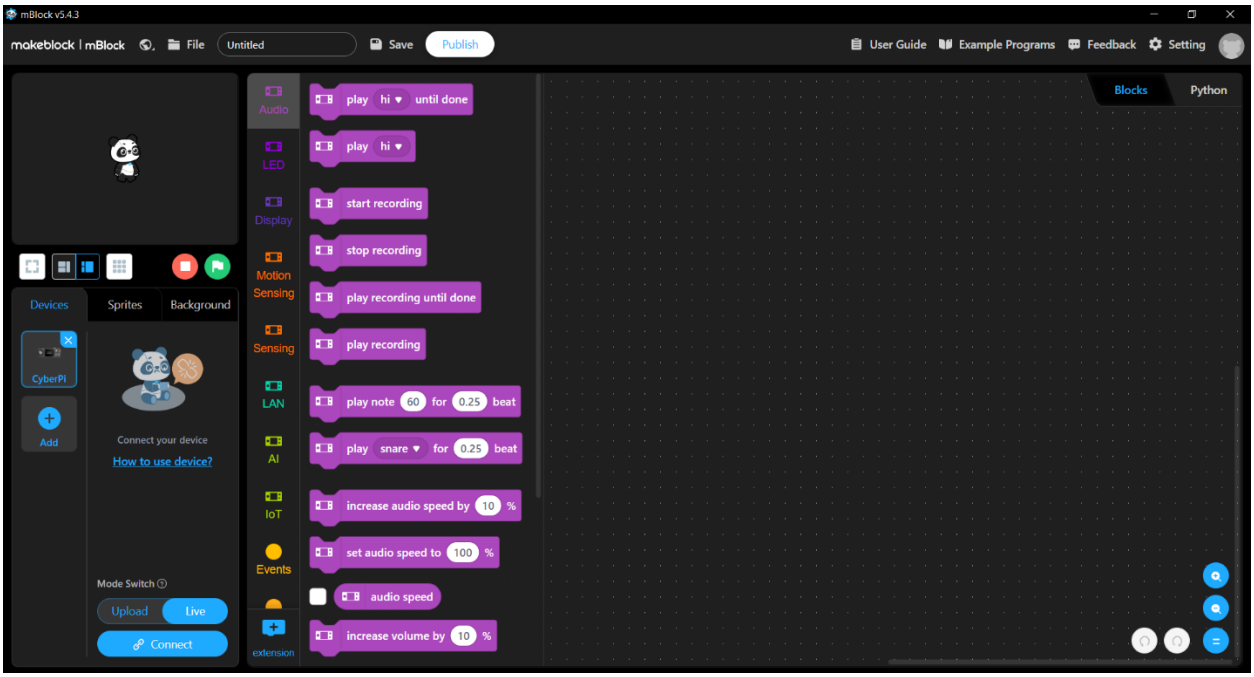
Next, you will scroll down to where it says download mBlock.



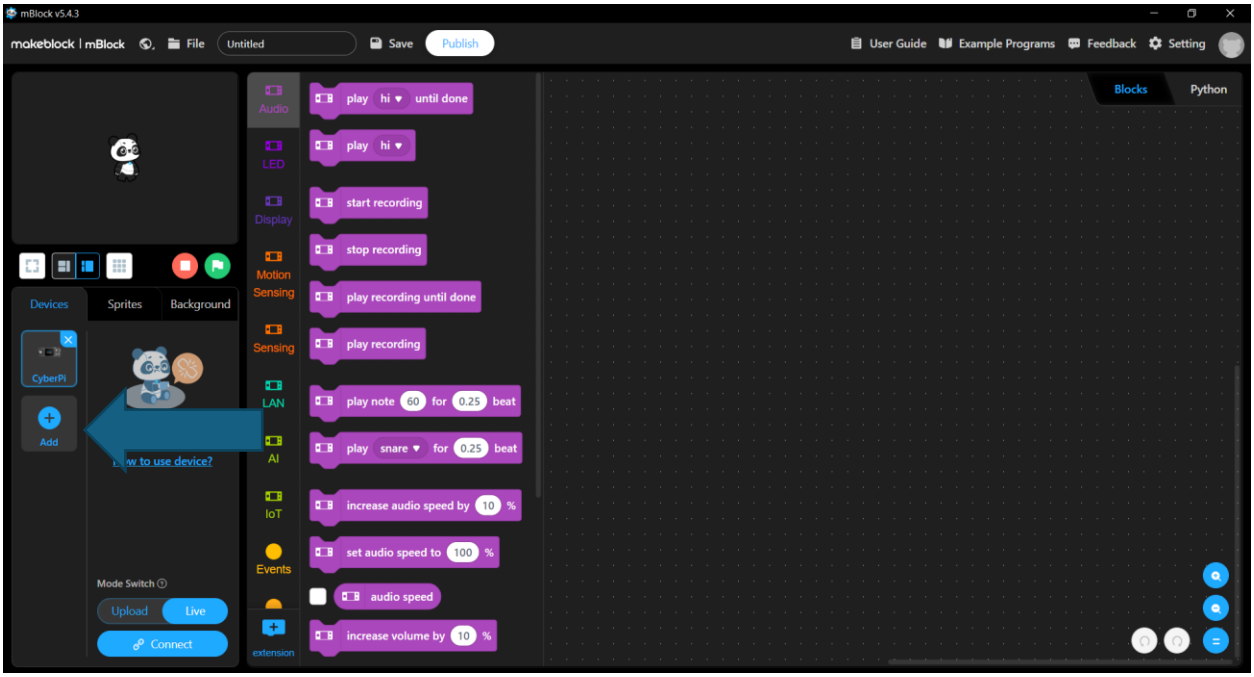
Look at where it says PC version, and download the one that corresponds to the device being used (Either Windows or Mac)



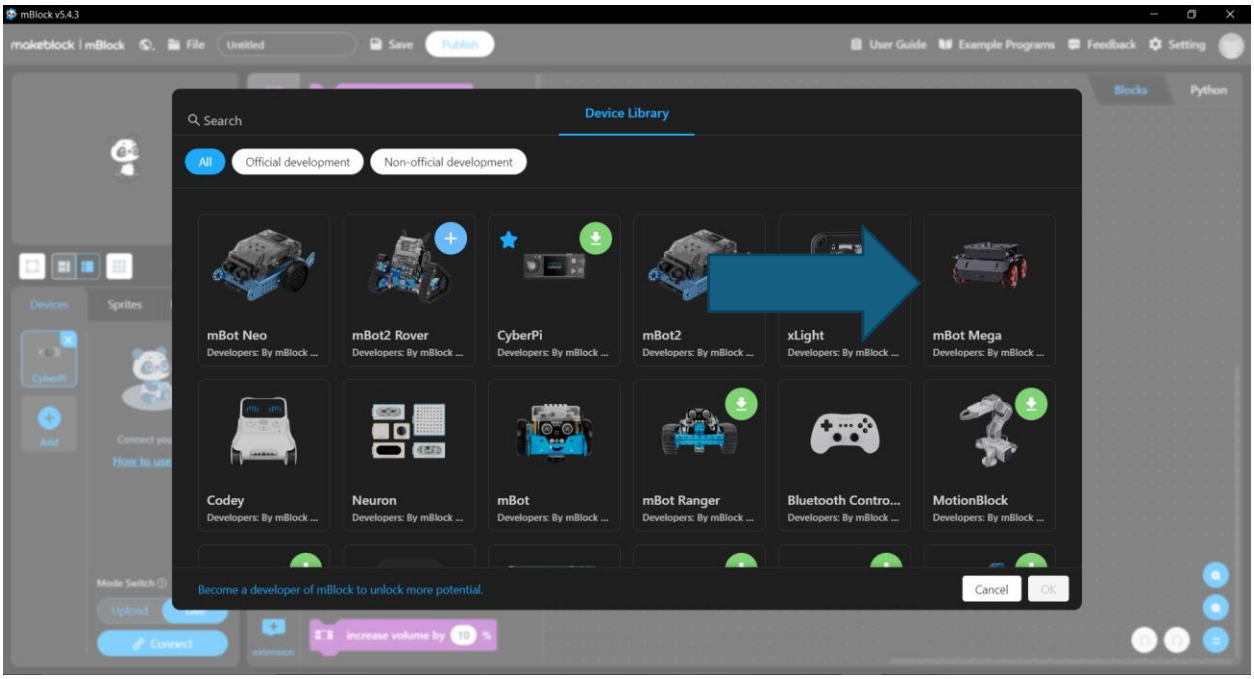
After downloading, your IDE should look like this when opened (yours may be white instead of black when first opened):



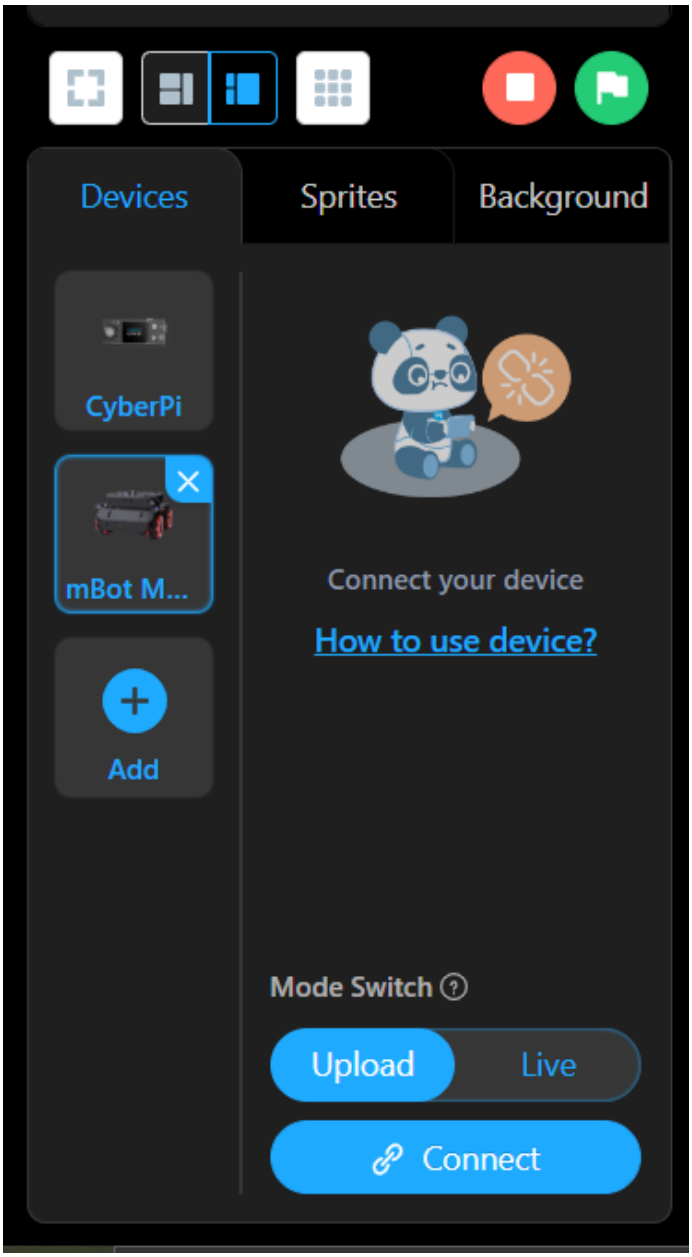
To add the mBot mega click the add button on the left side of the screen



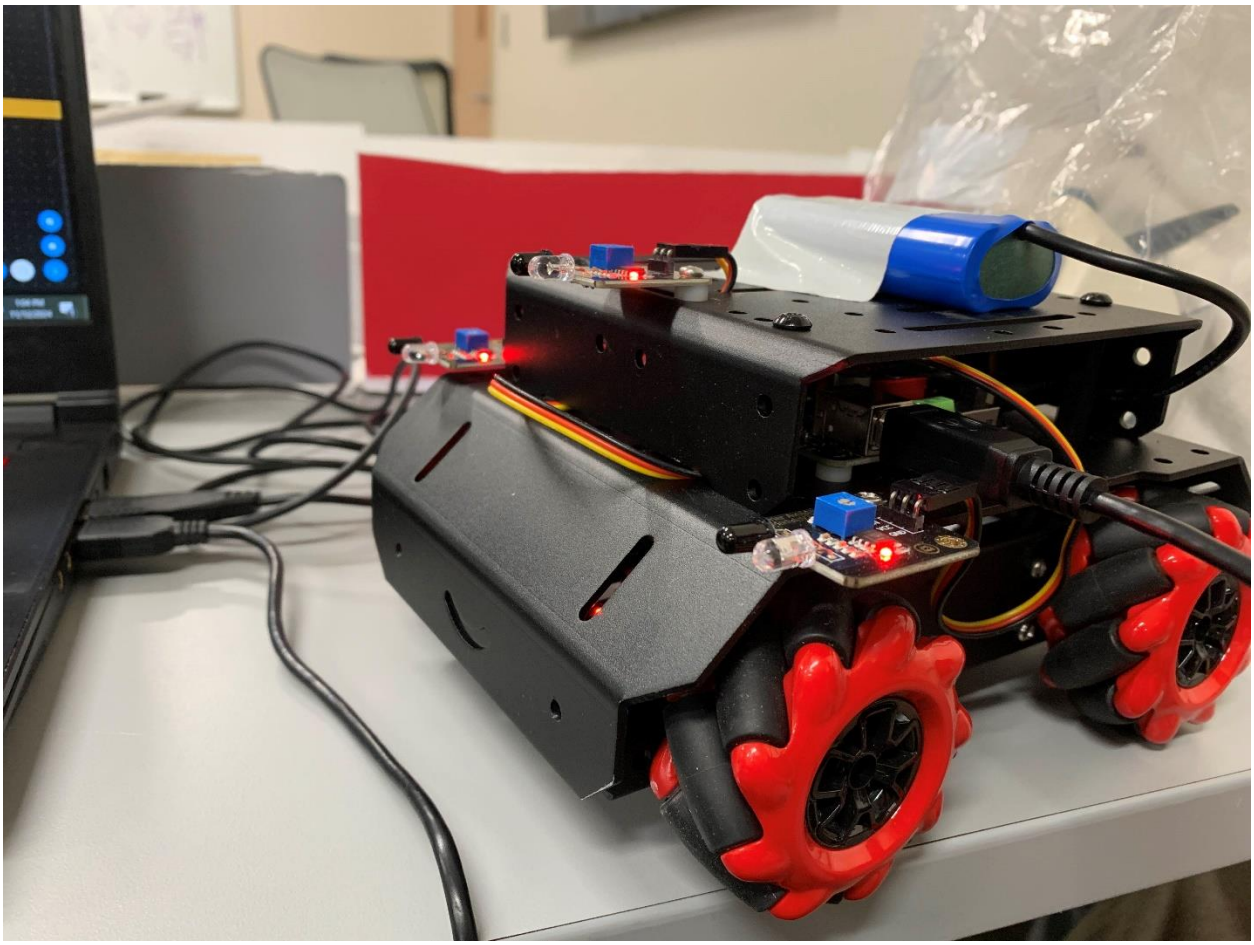
Next, click the mBot mega to add it to your devices, and click OK after clicking mBot mega



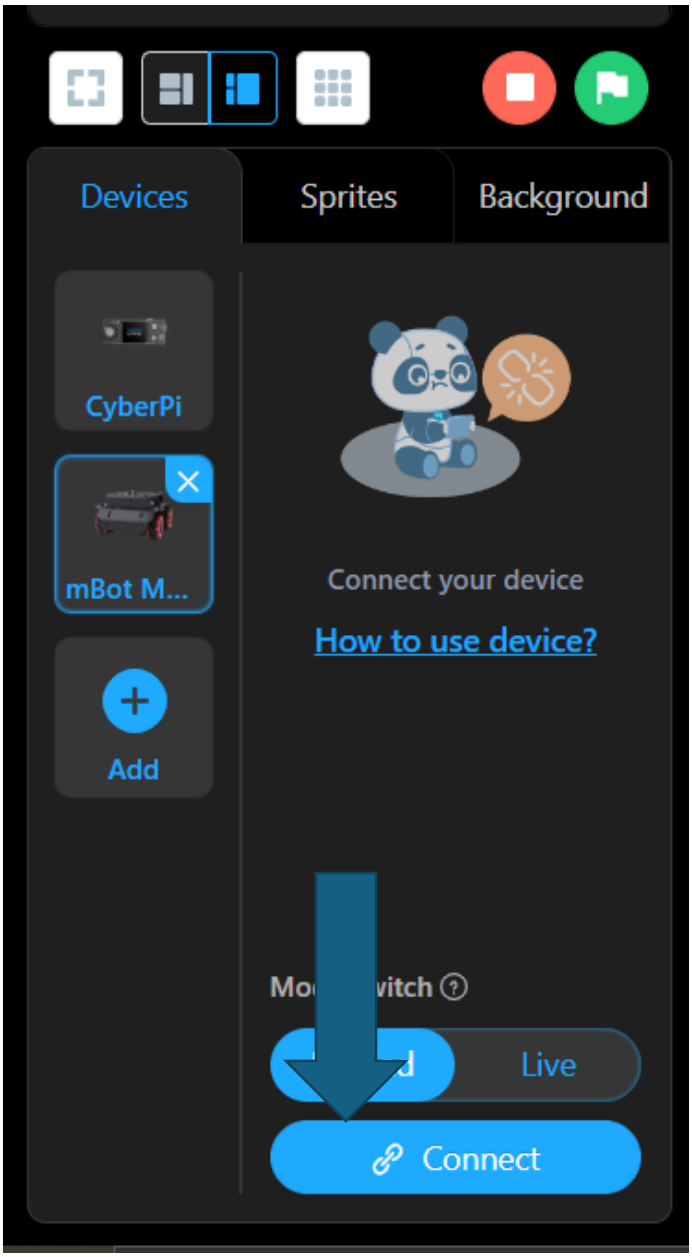
Make sure that the mode is switched to upload and not live, the blue should be highlighted for Upload



Once your mBot is connected like this,



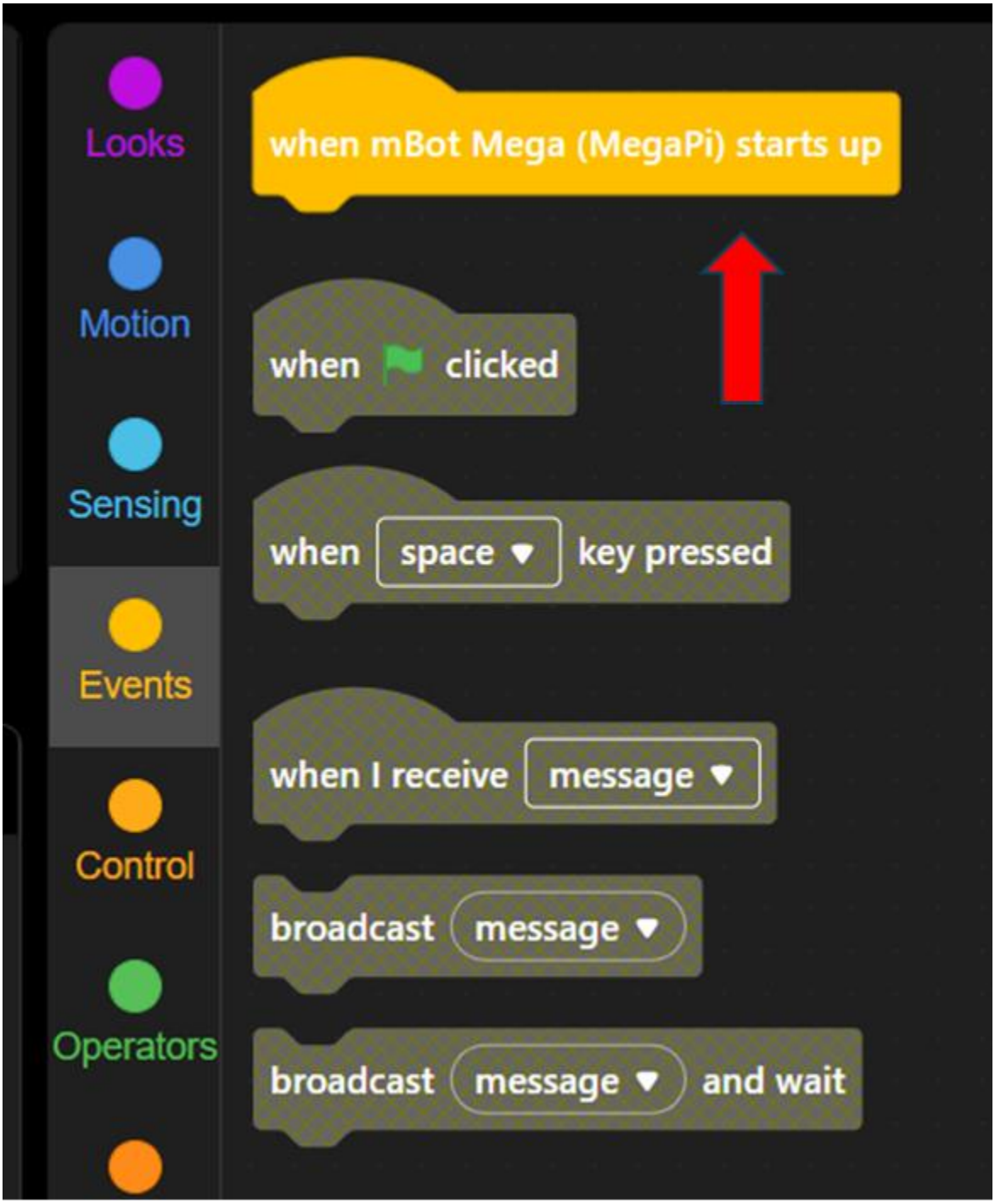
Make sure the wire is connected to the raspberry pi on the bot and the USB is connected to your device, click the connect button and connect your bot.



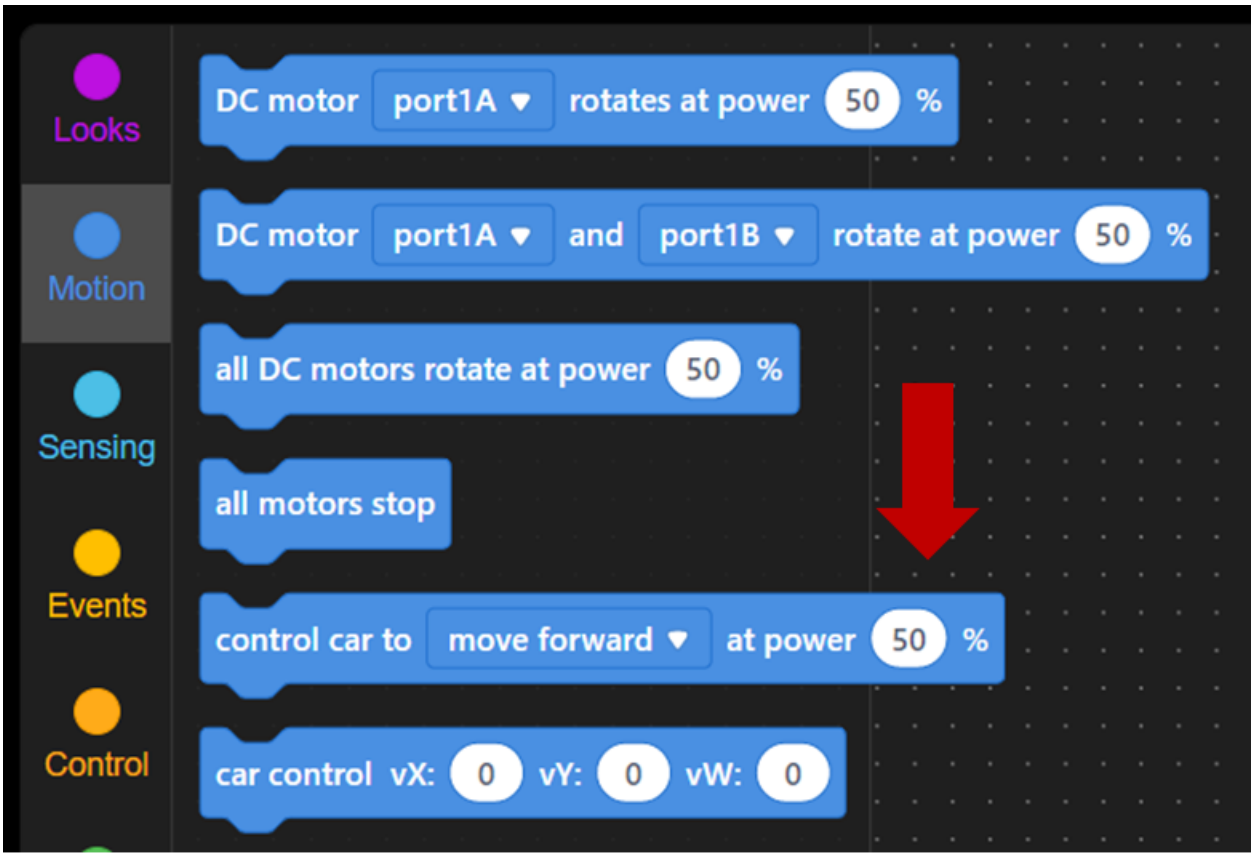
We have three parts to our demo:

I. Coding the bot to move back and forth
II. Coding the bot to detect an obstacle
III. The crash detection feature

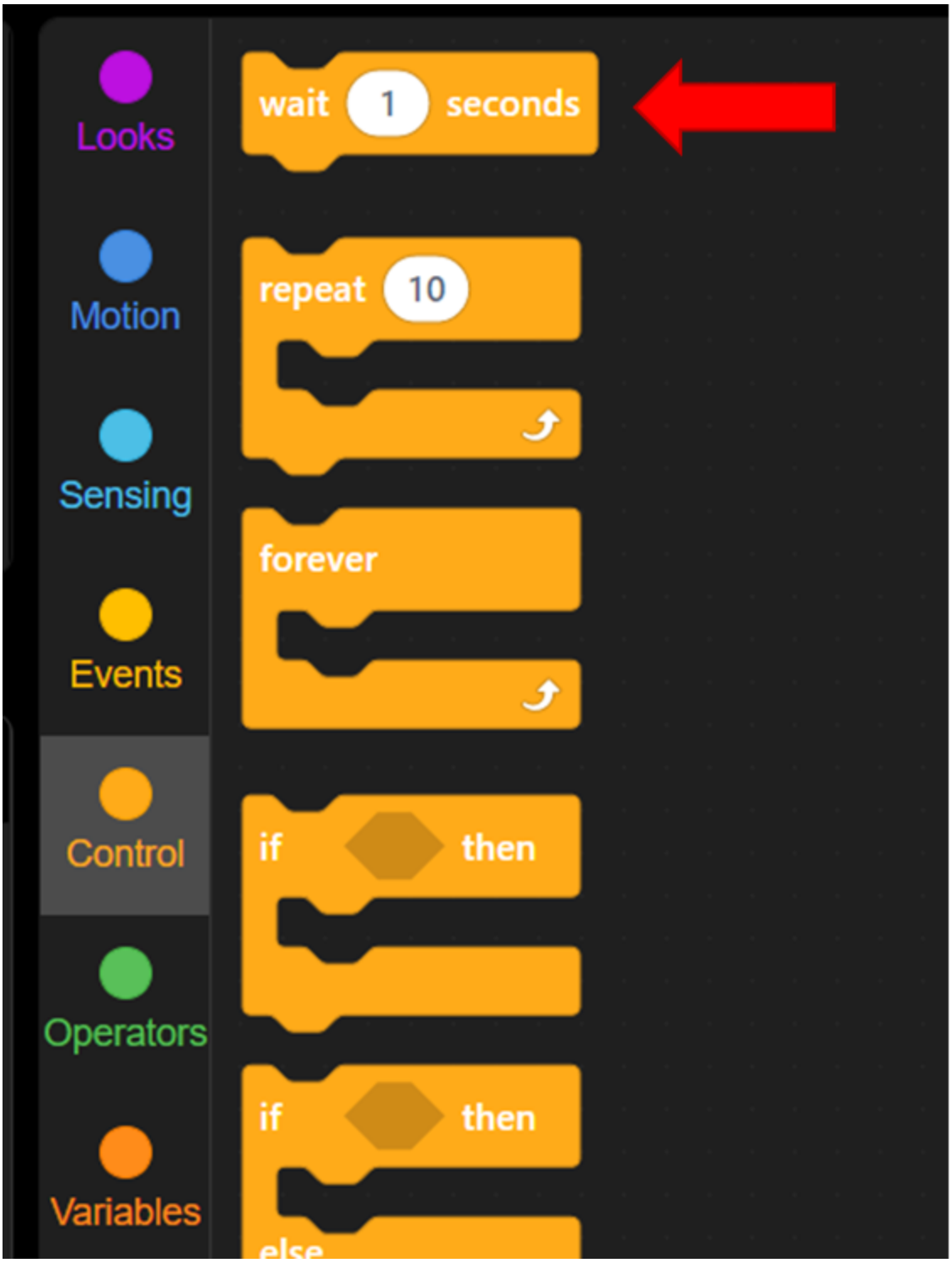
1. Coding the bot to move back and forth

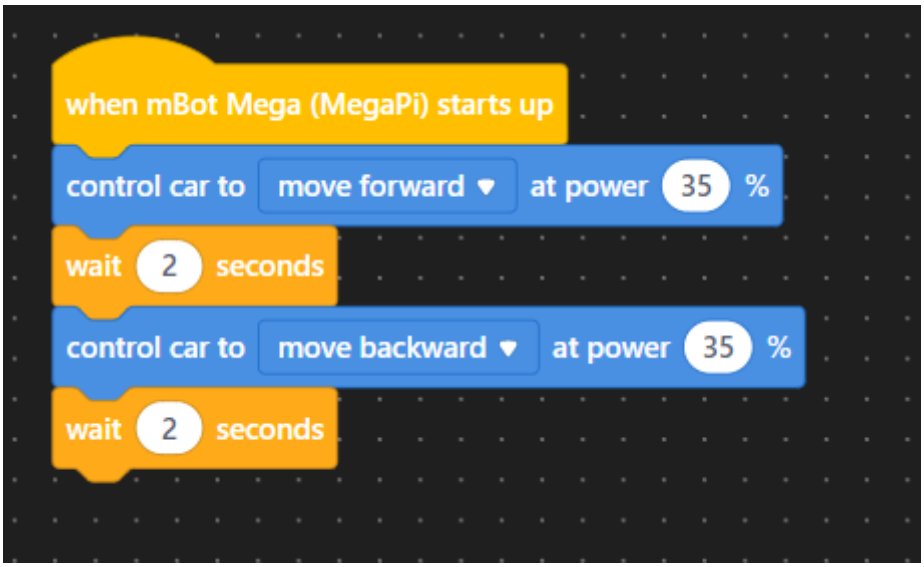

Looks
Motion
Sensing
Events
Control
Operators
when mBot Mega (MegaPi) starts up
when clicked
when space key pressed
when I receive message
broadcast message
broadcast message and wait

Make sure to grab two of the move blocks

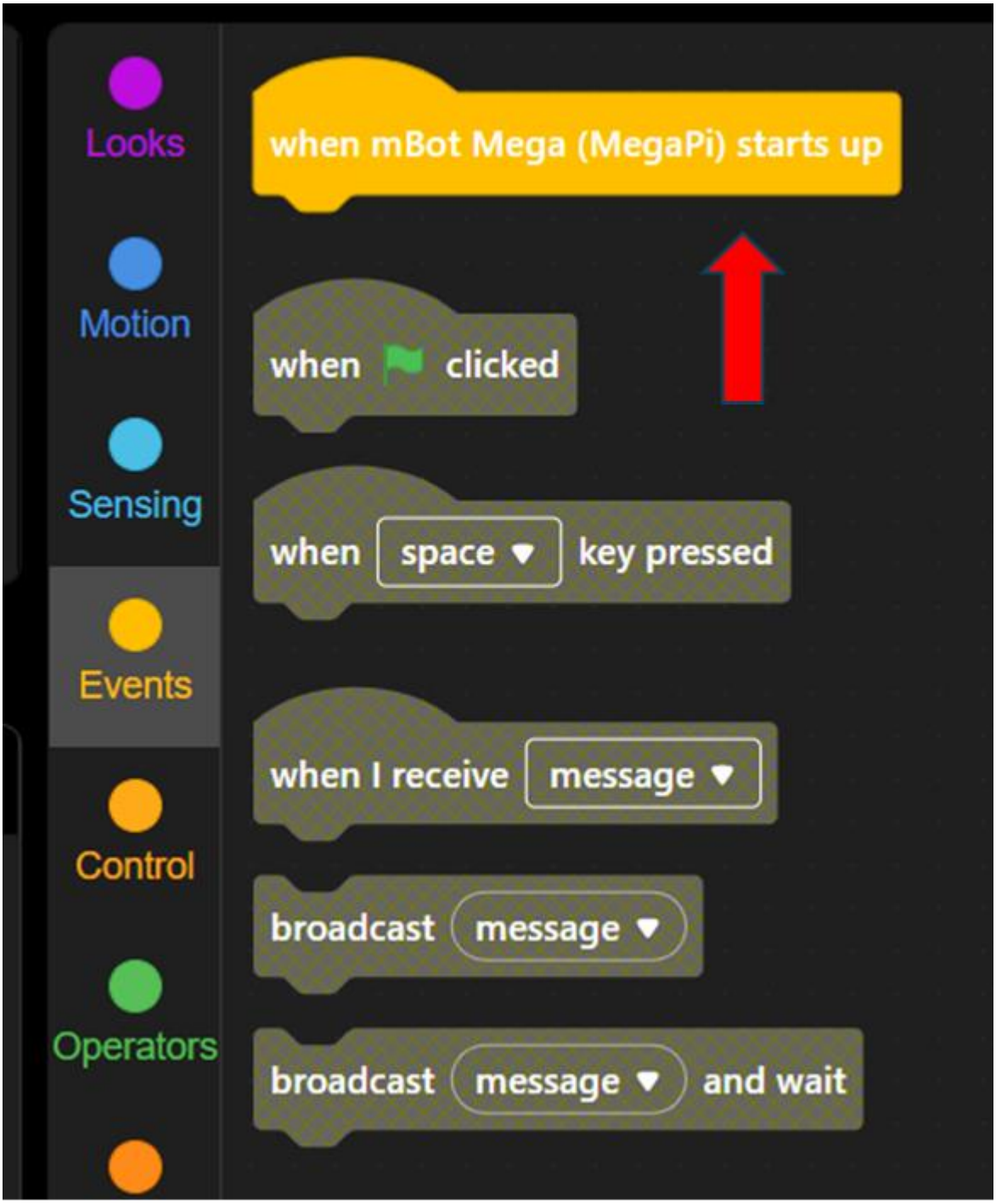


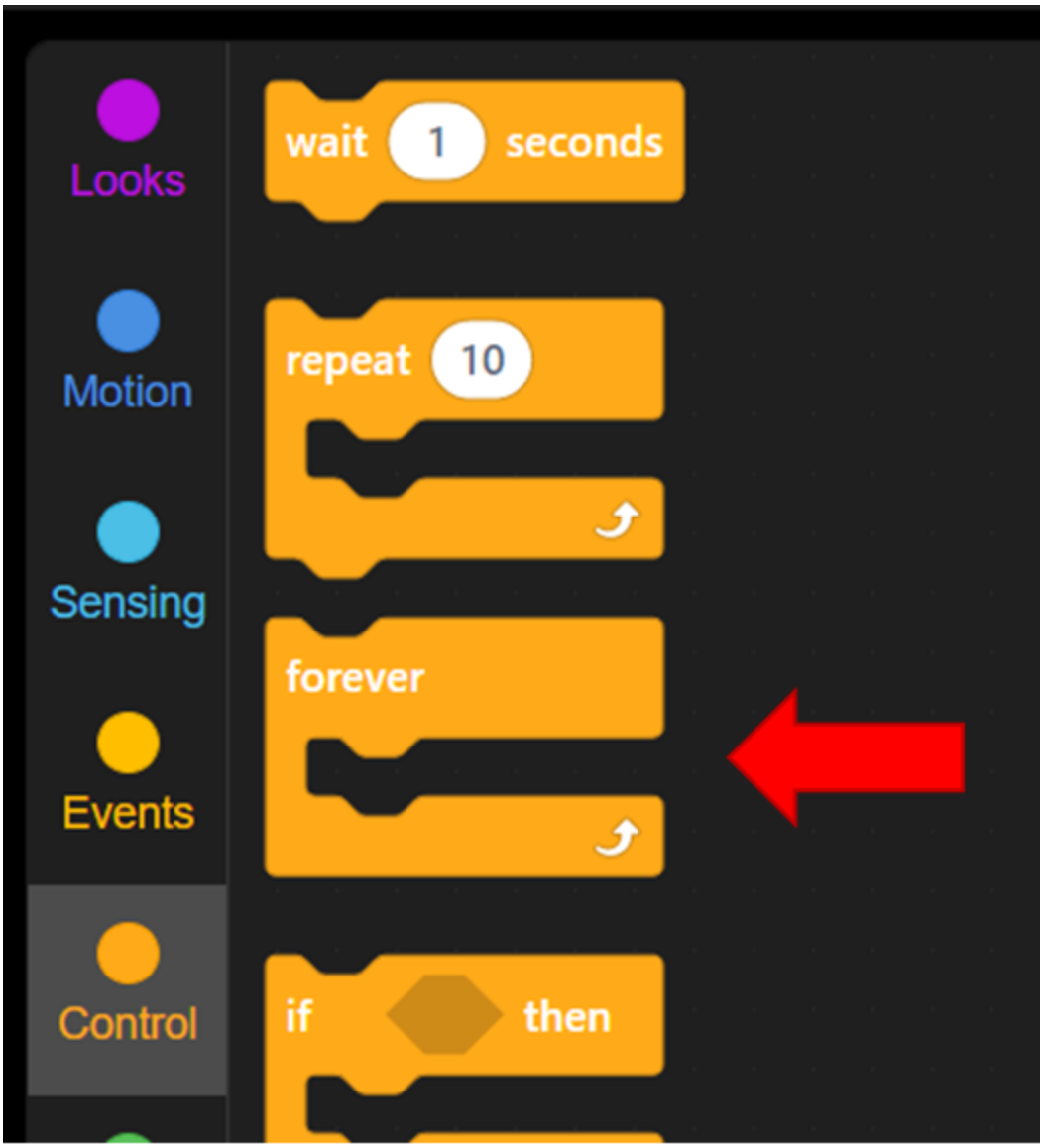
Make sure to grab two wait second blocks

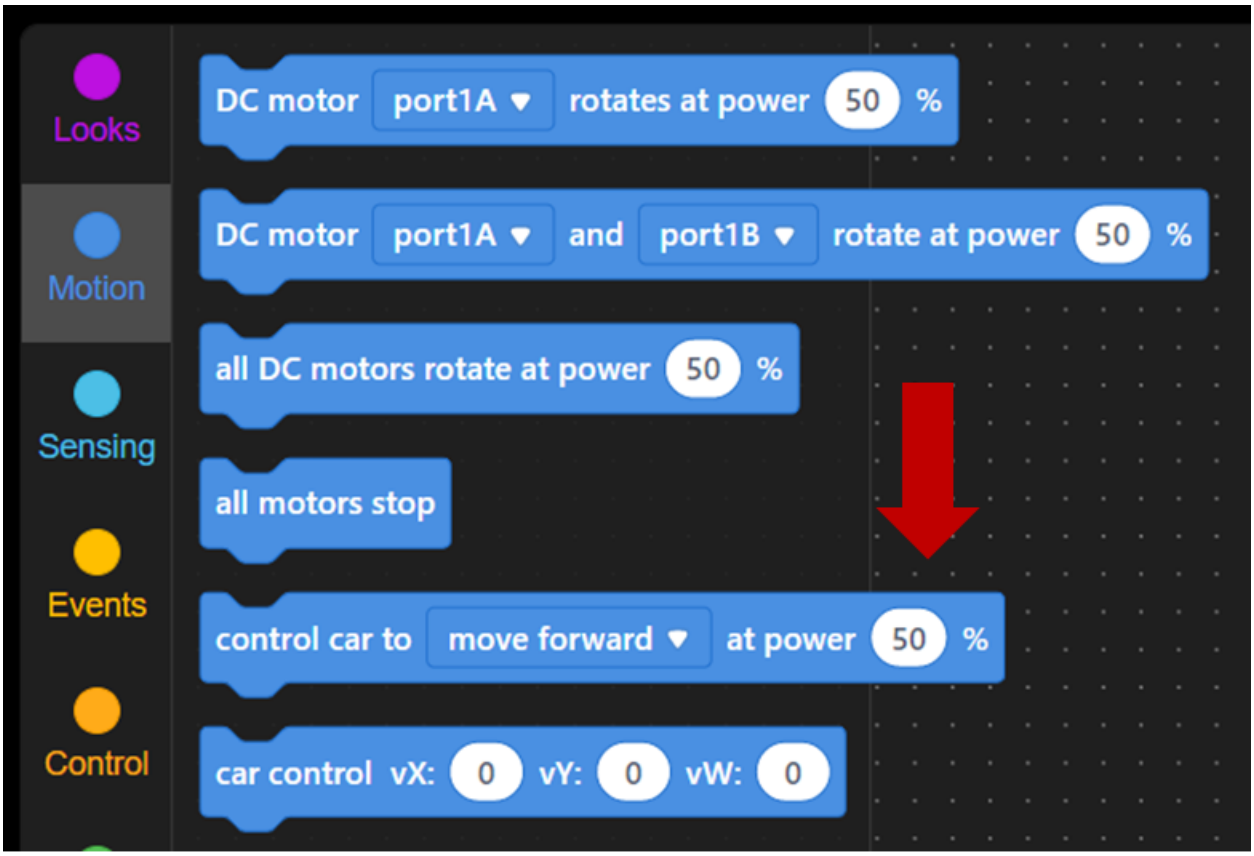

Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else

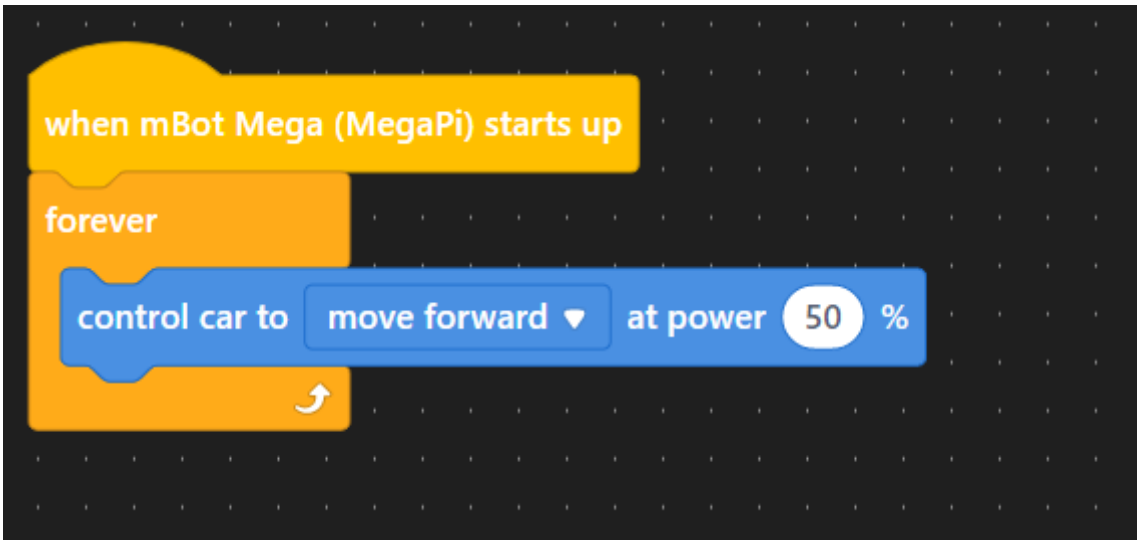


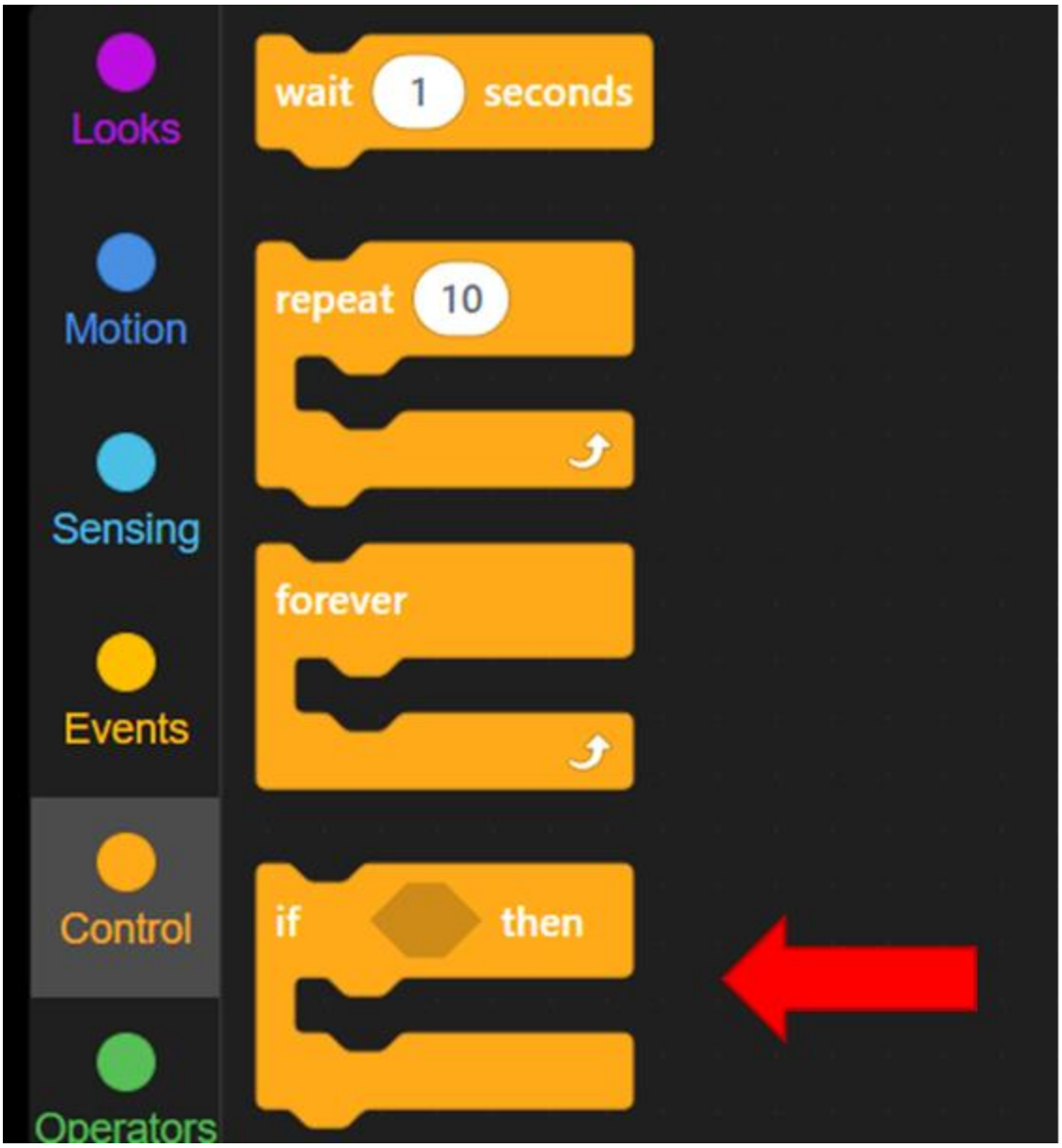
2. Coding the bot to detect an obstacle

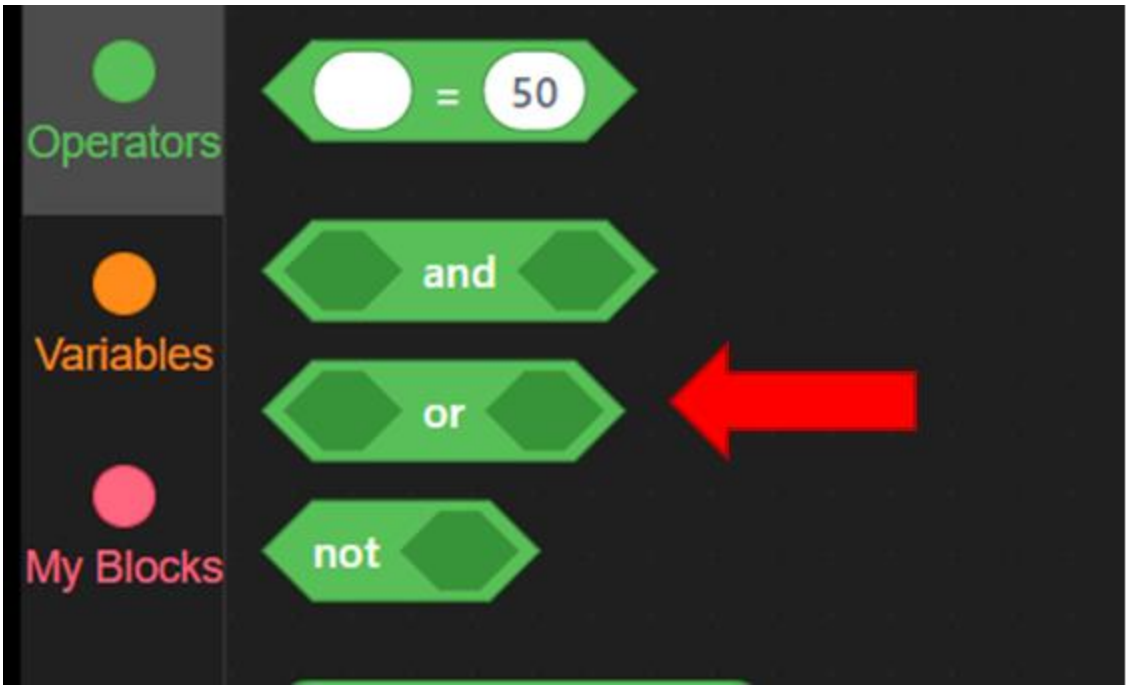

Looks
Motion
Sensing
Events
Control
Operators
when mBot Mega (MegaPi) starts up
when clicked
when space key pressed
when I receive message
broadcast message
broadcast message and wait


Looks
Motion
Sensing
Events
Control
wait 1 seconds
repeat 10
forever
if then

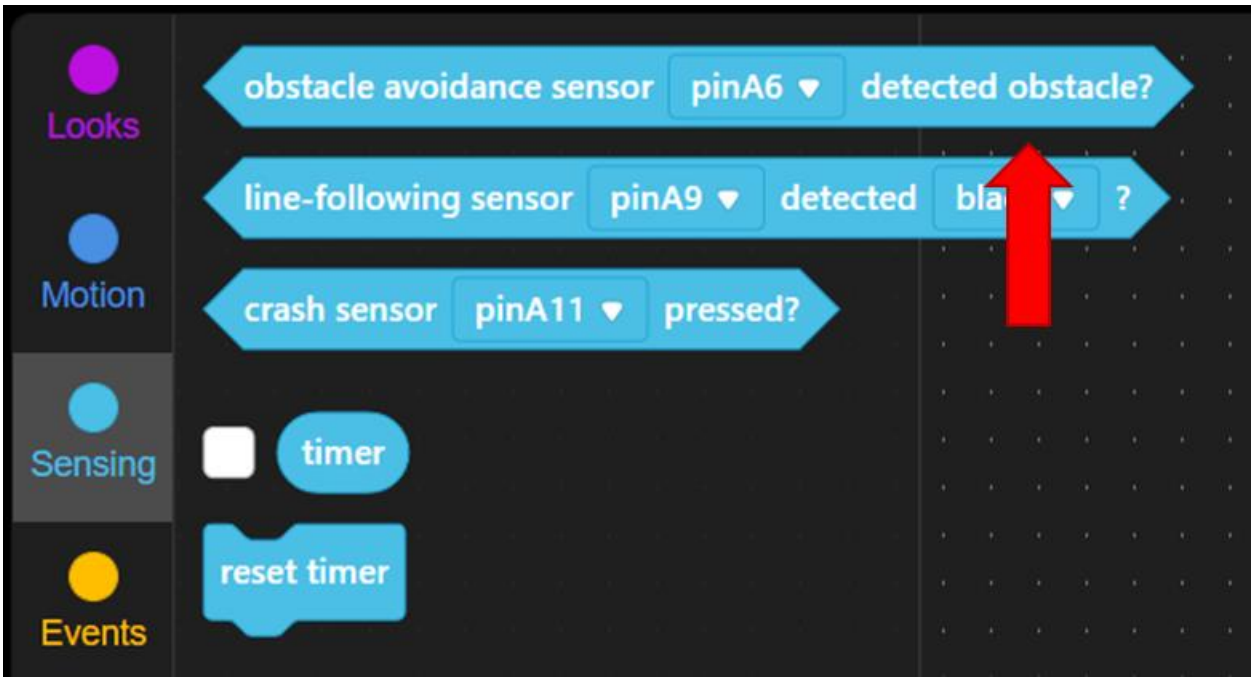

Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0

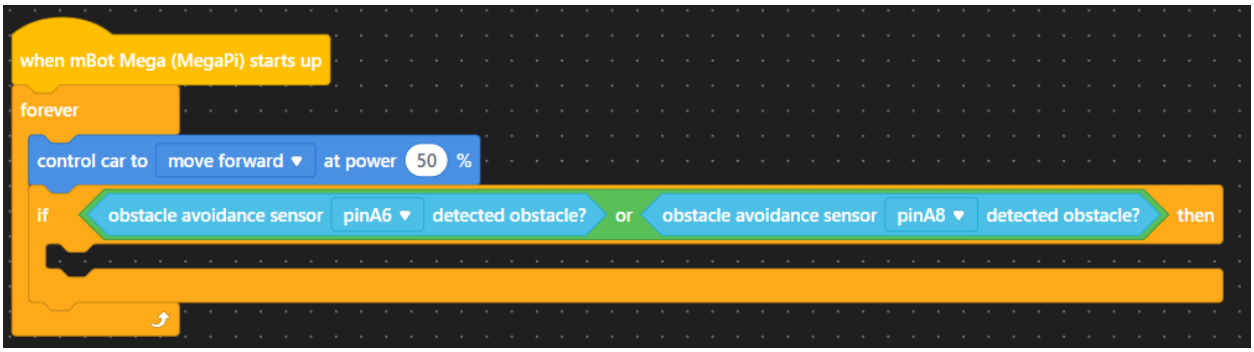

when mBot Mega (MegaPi) starts up
forever
control car to move forward at power 50 %

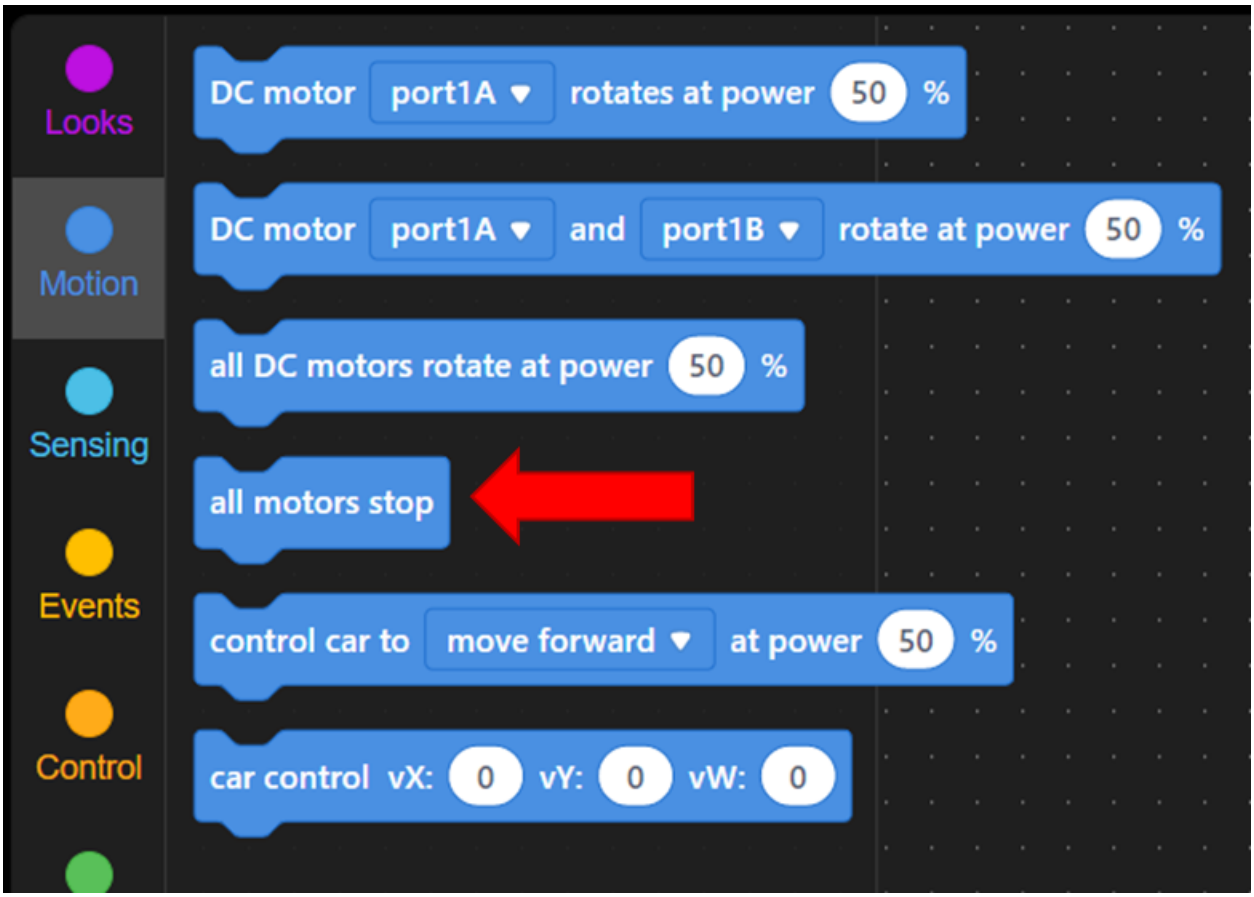

Looks
Motion
Sensing
Events
Control
Operators
wait 1 seconds
repeat 10
forever
if then

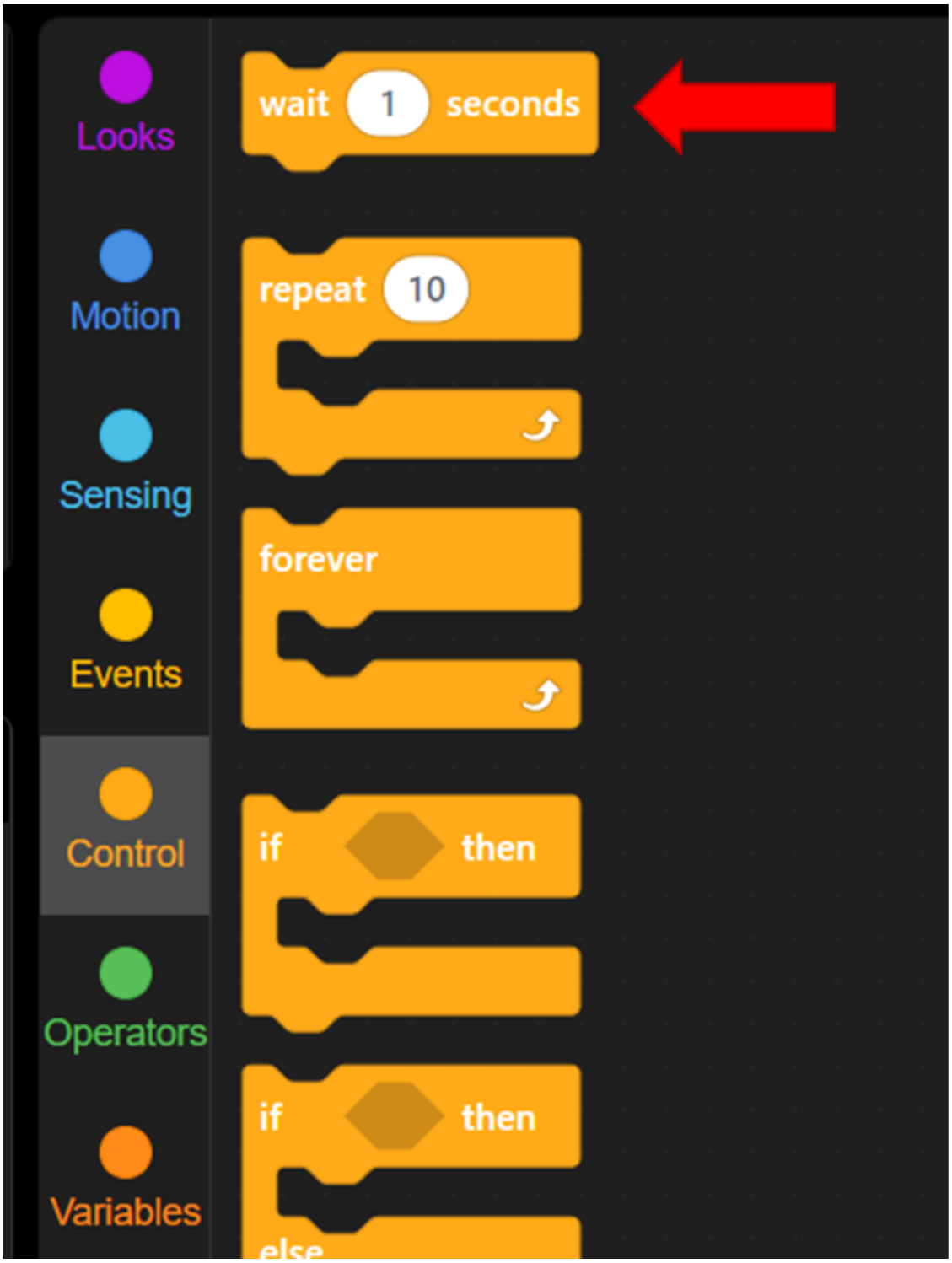


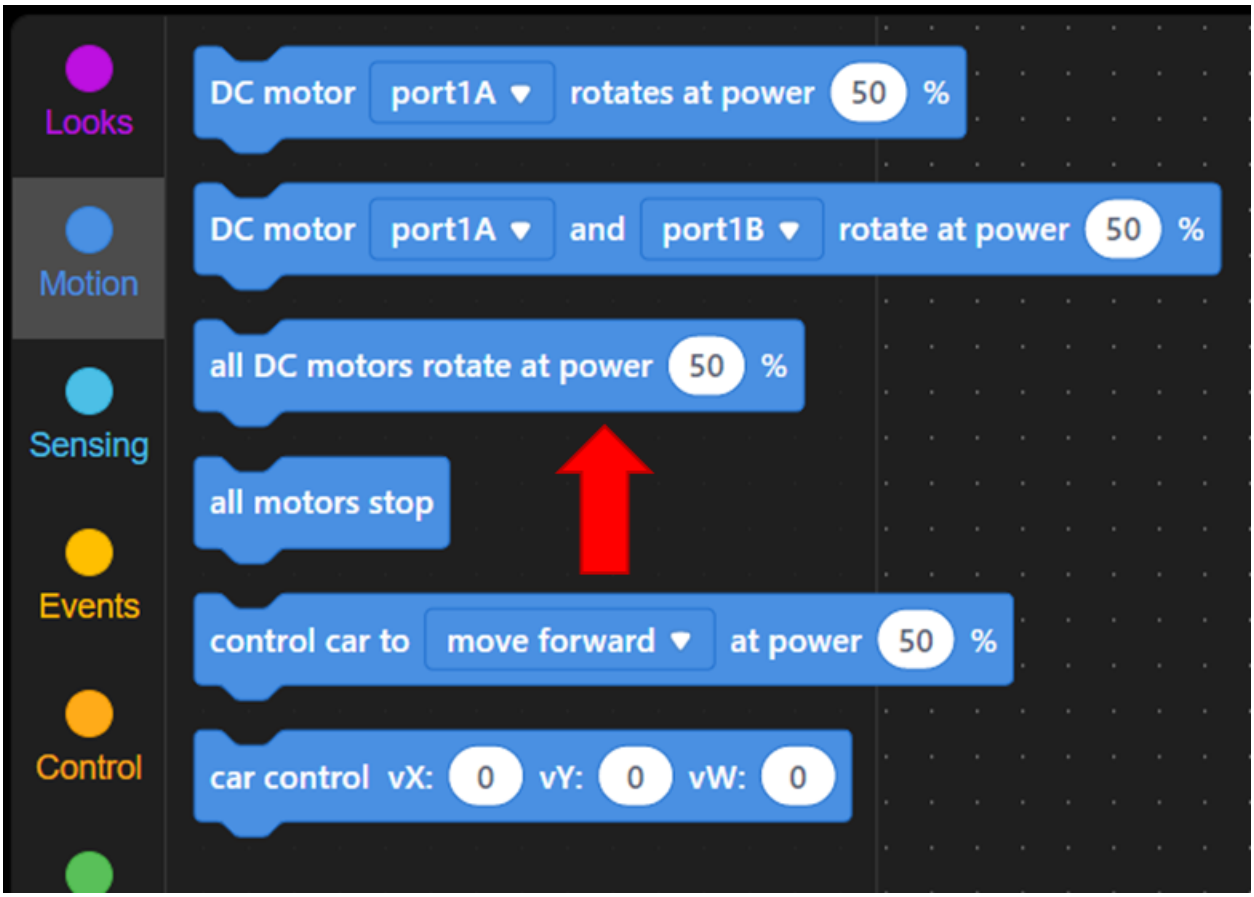
Grab two of the sensors block, and set them both to pin A6 and pin A8

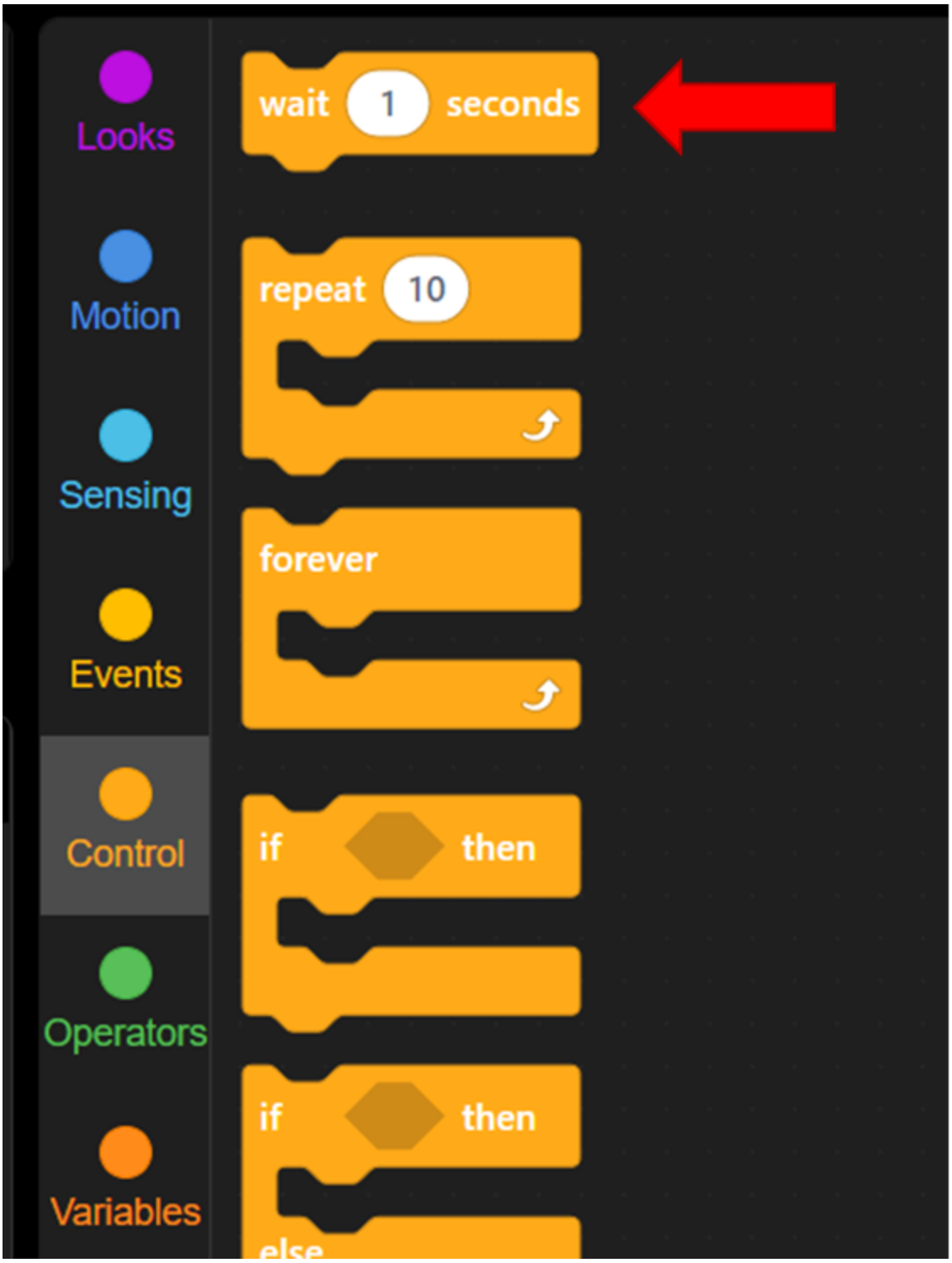

Looks
Motion
Sensing
Events
obstacle avoidance sensor pinA6 detected obstacle?
line-following sensor pinA9 detected
crash sensor pinA11 pressed?
timer
reset timer

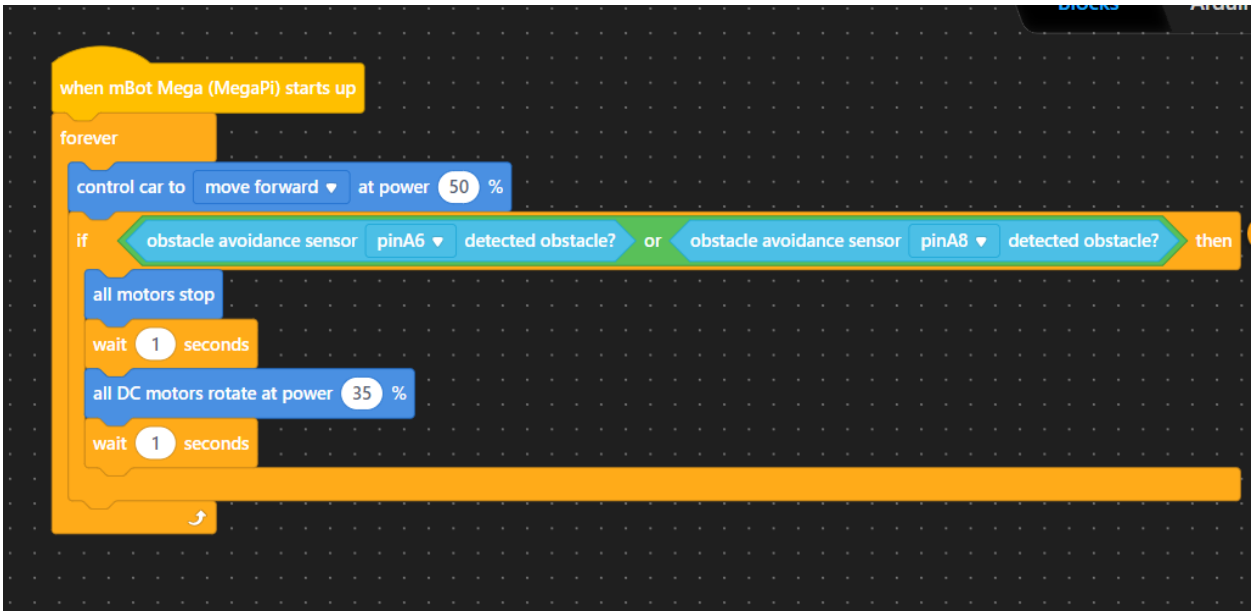

when mBot Mega (MegaPi) starts up
forever
control car to move forward at power 50 %
if obstacle avoidance sensor pinA6 detected obstacle? or obstacle avoidance sensor pinA8 detected obstacle? then


Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0

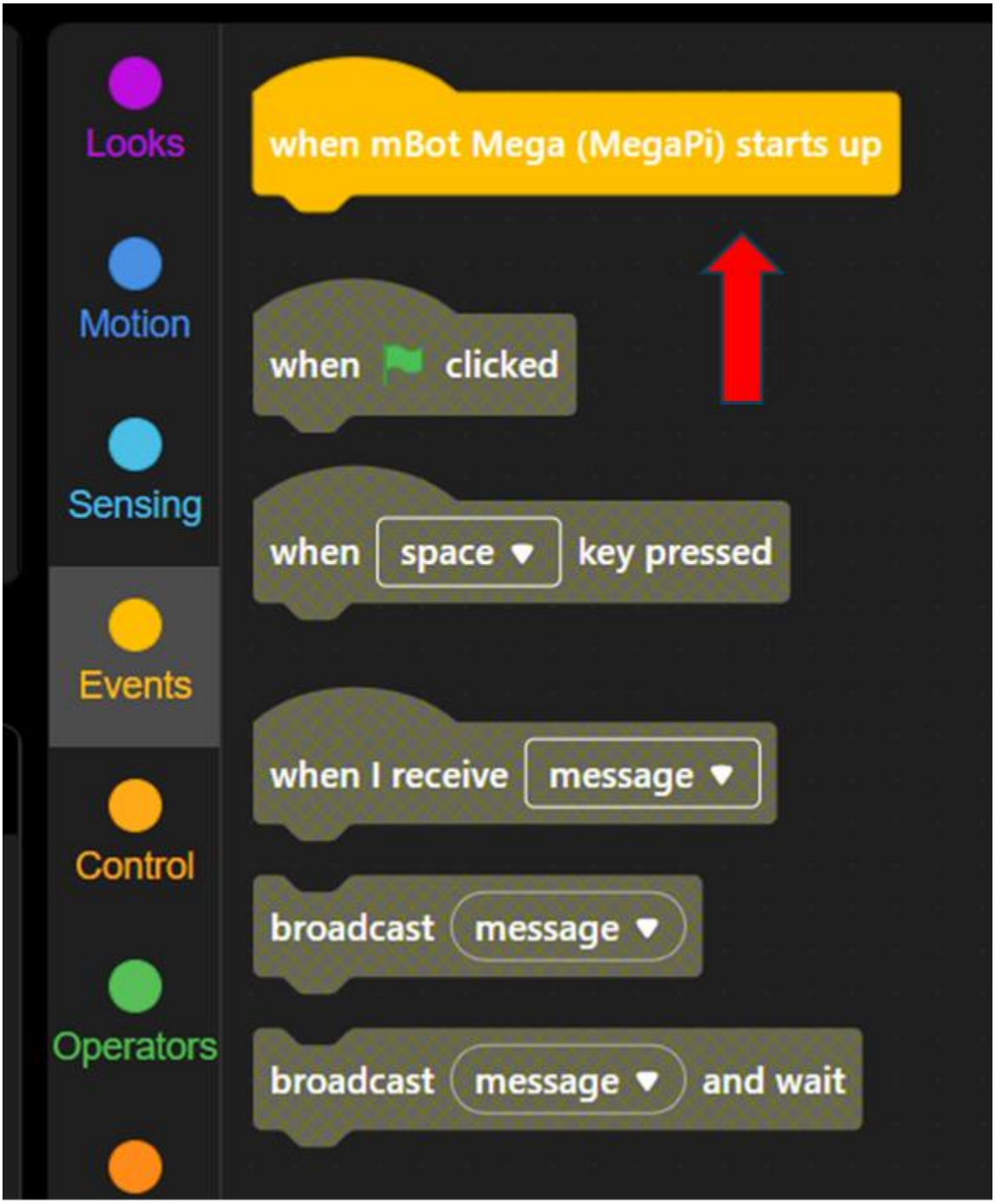

Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else

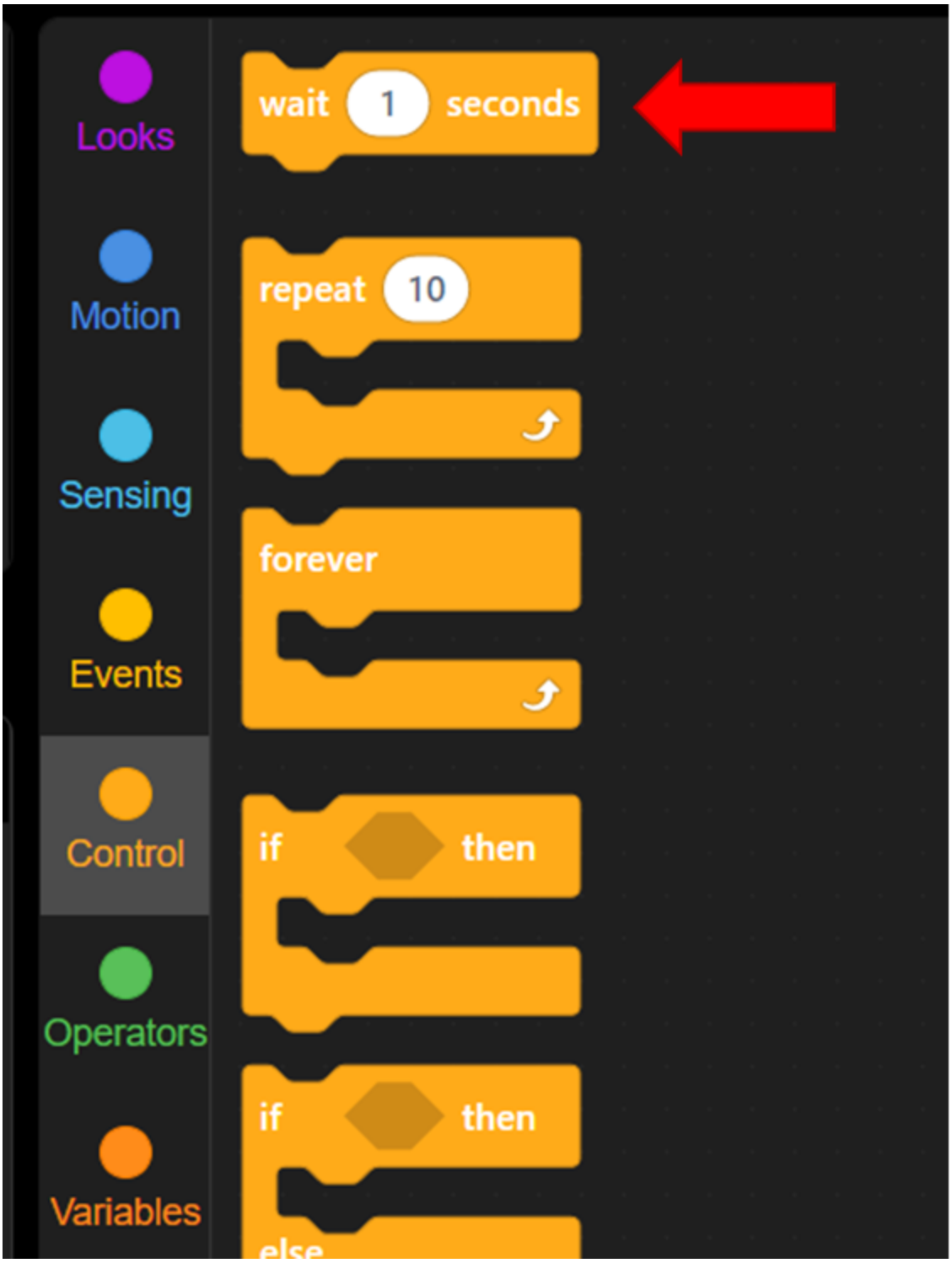

Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0

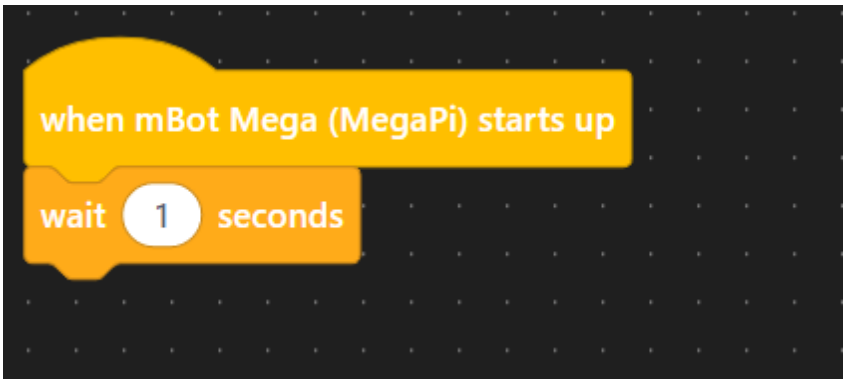

Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else

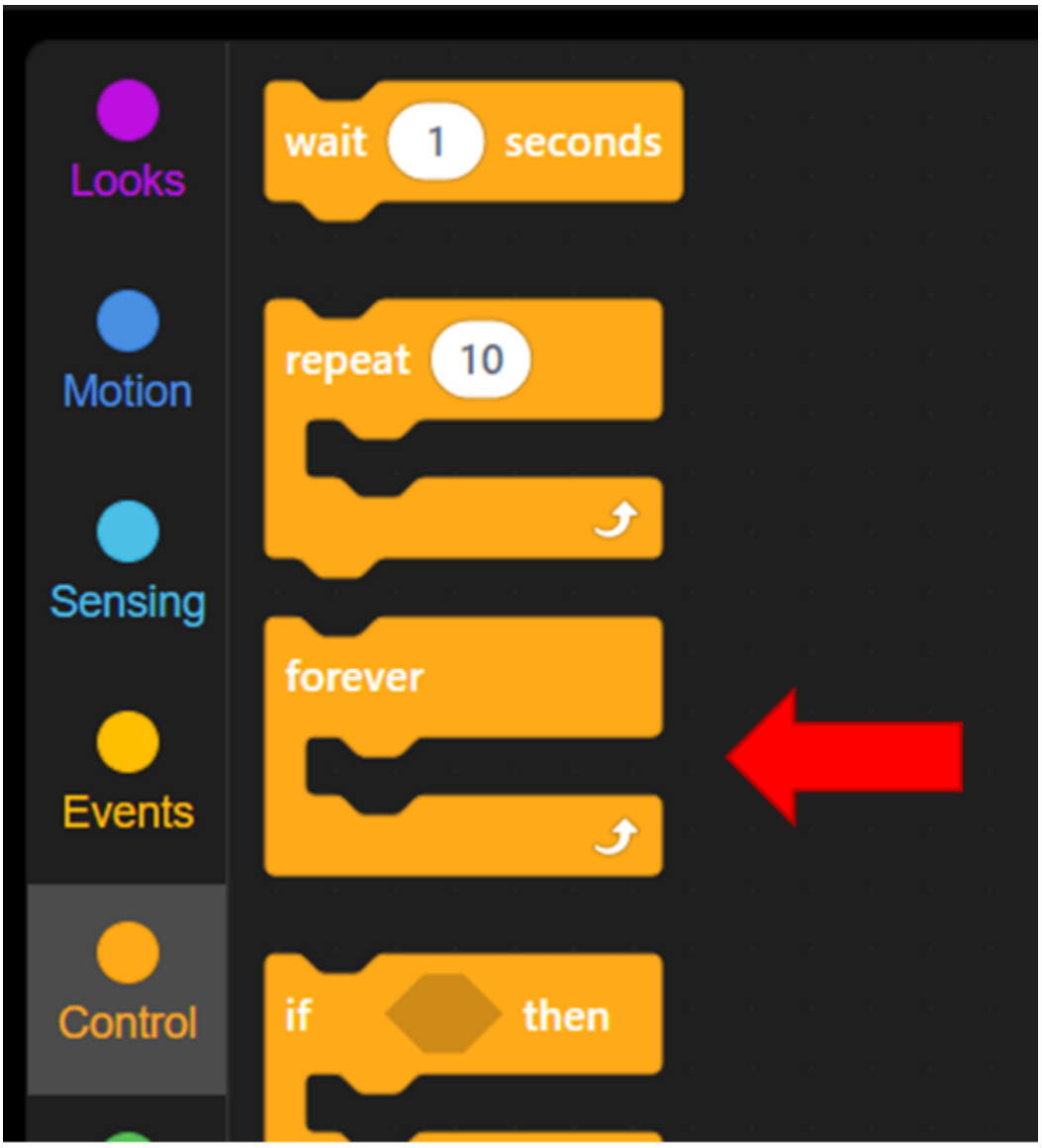


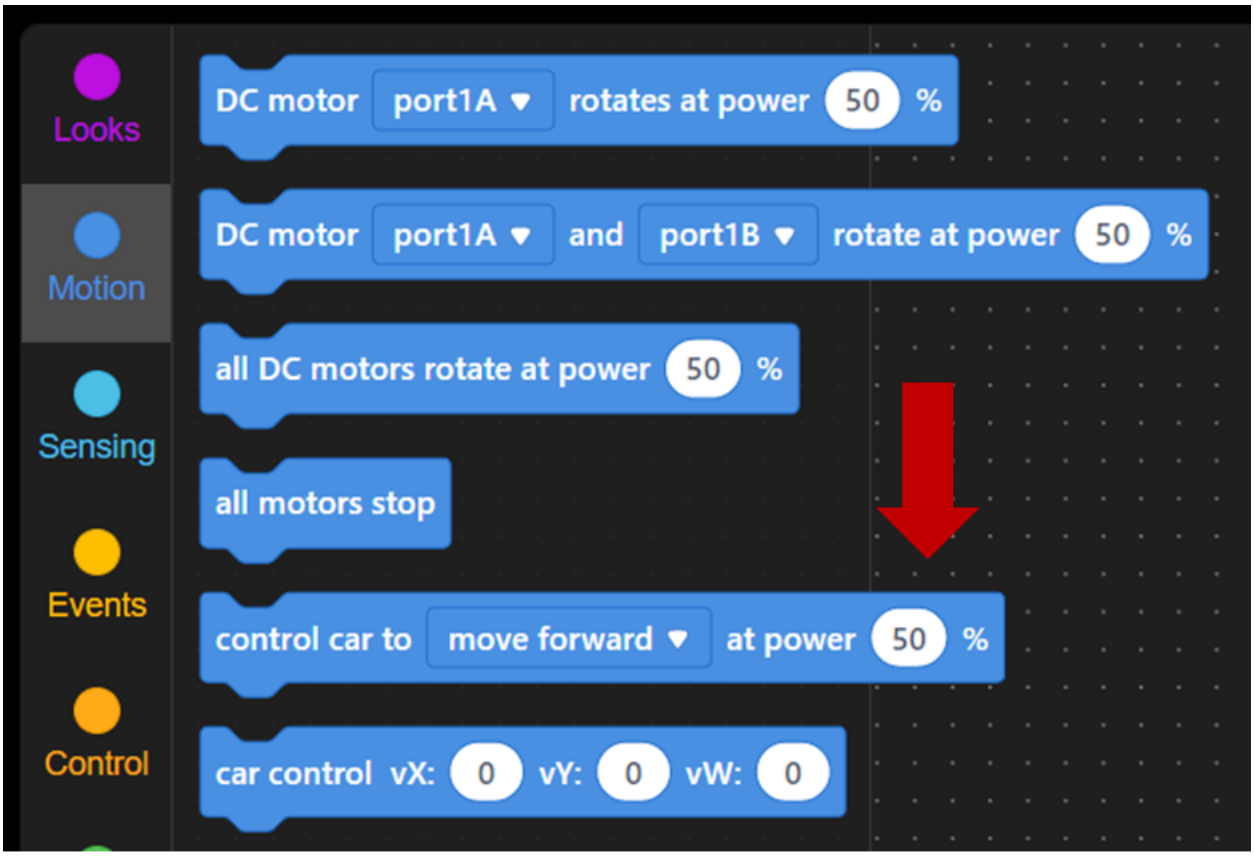
3. The Crash Detection Code


Looks
Motion
Sensing
Events
Control
Operators
when mBot Mega (MegaPi) starts up
when clicked
when space key pressed
when I receive message
broadcast message
broadcast message and wait

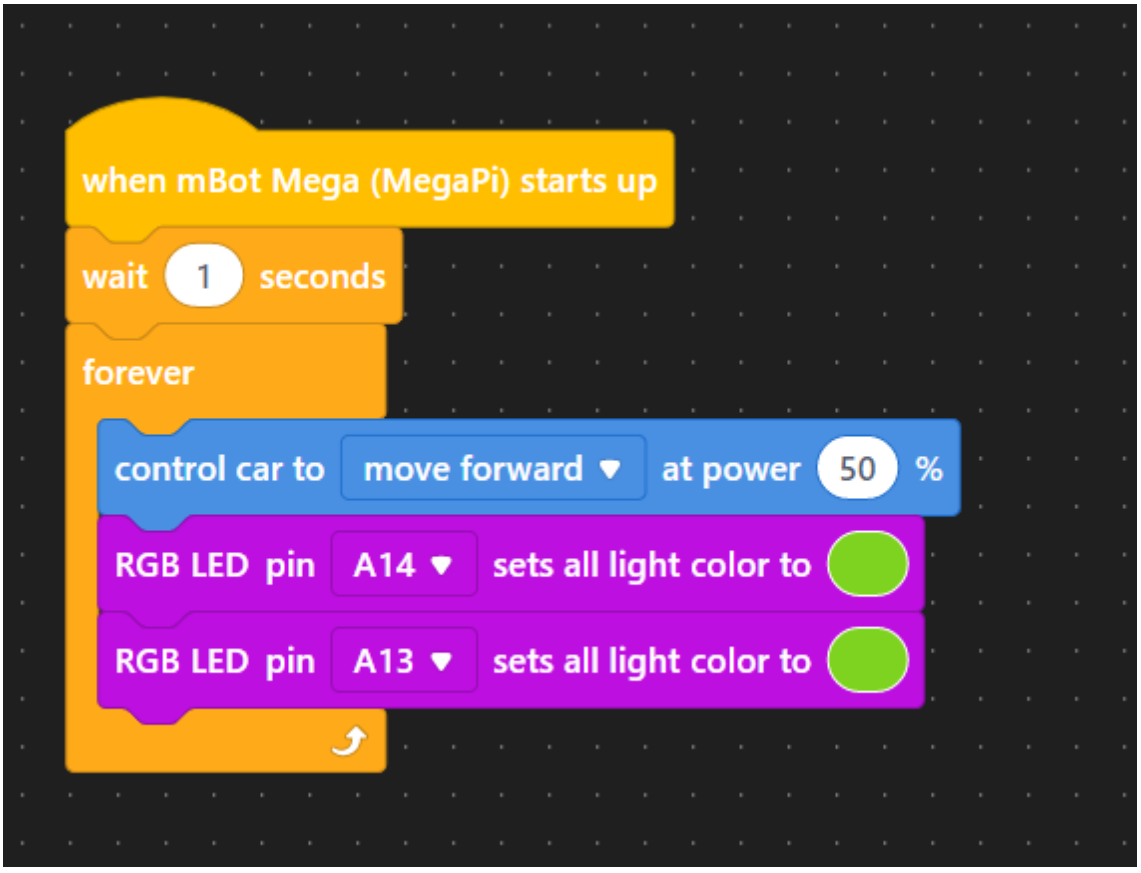

Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else

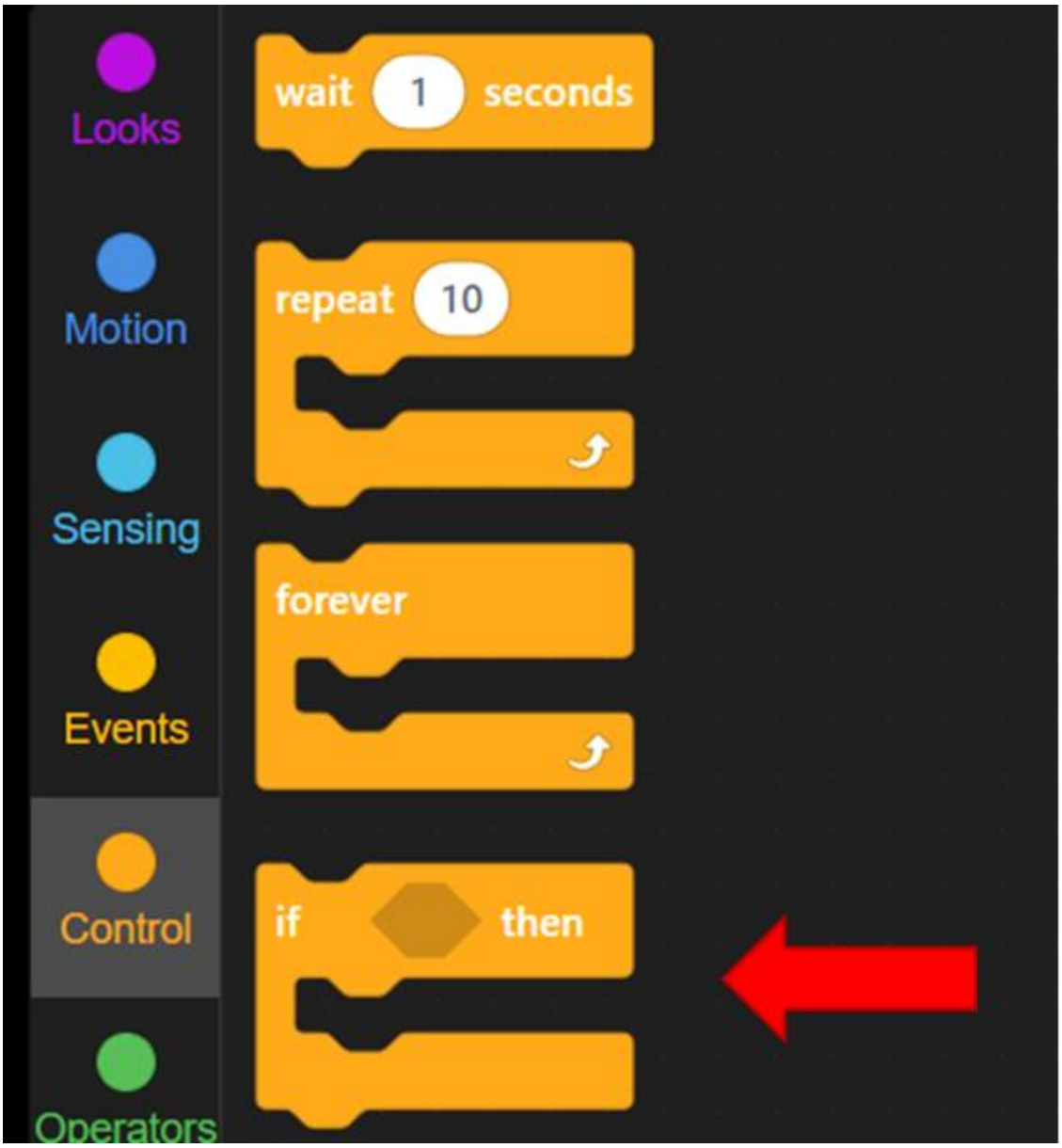

when mBot Mega (MegaPi) starts up
wait 1 seconds

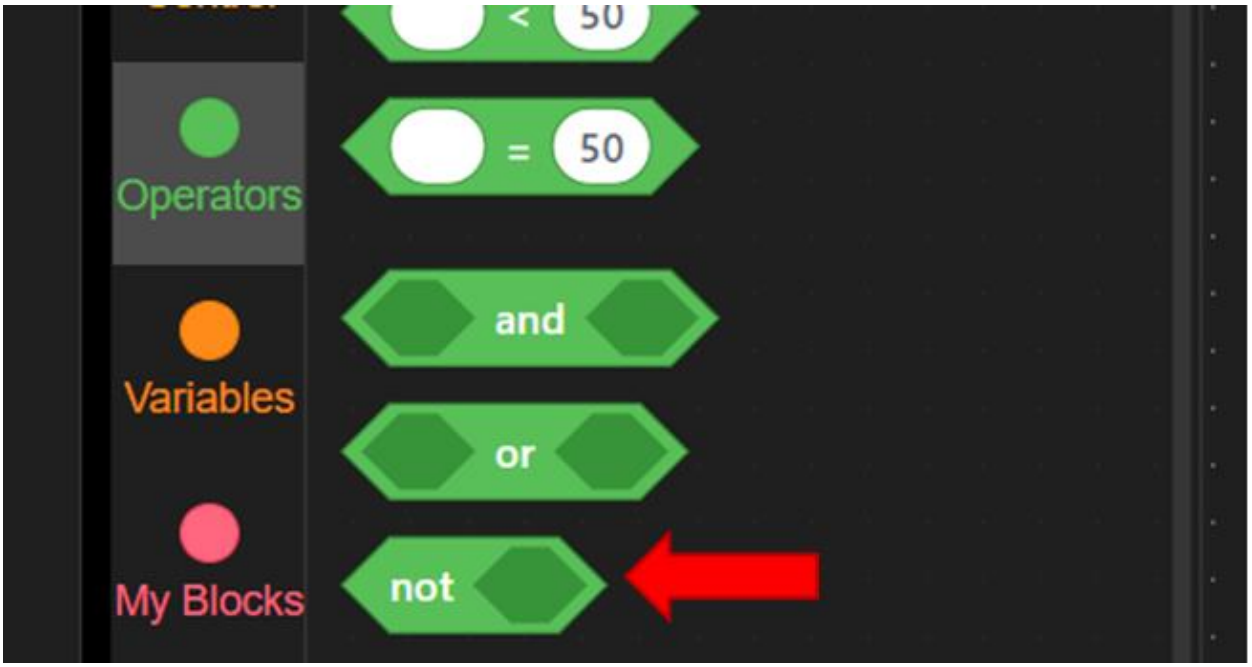

Looks
Motion
Sensing
Events
Control
wait 1 seconds
repeat 10
forever
if then

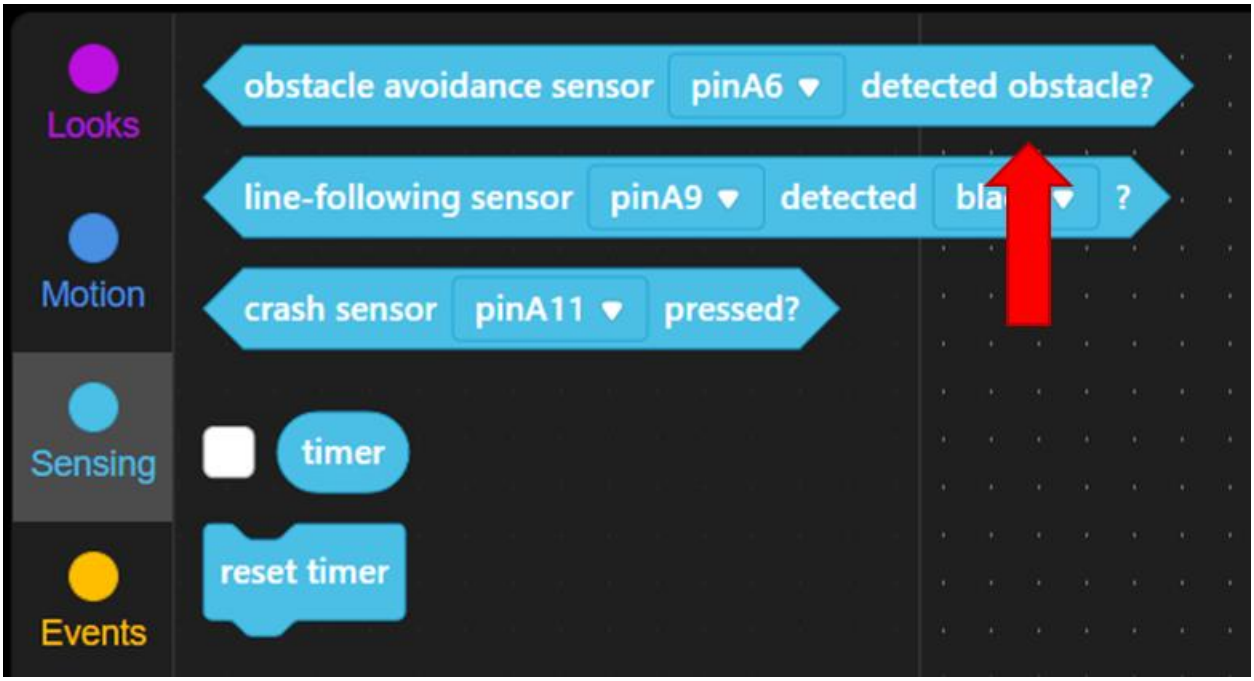

Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0

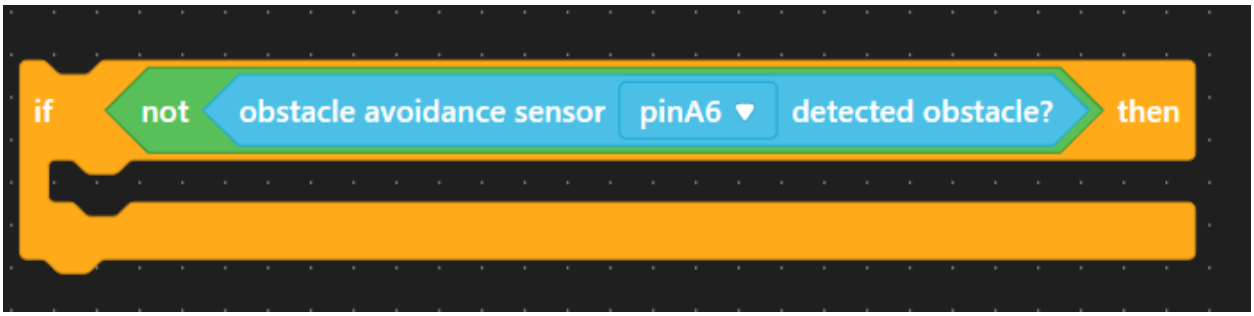

Looks
Motion
Sensing
Events
RGB LED pin A13 turns on bead 1 , color
RGB light pin A13 turns on bead 1 , color R 255 G 0 B 0
RGB LED pin A13 turns off bead 1
RGB LED pin A13 sets all light color to
RGB LED pin A13 sets all light color to R 255 G 0 B 0

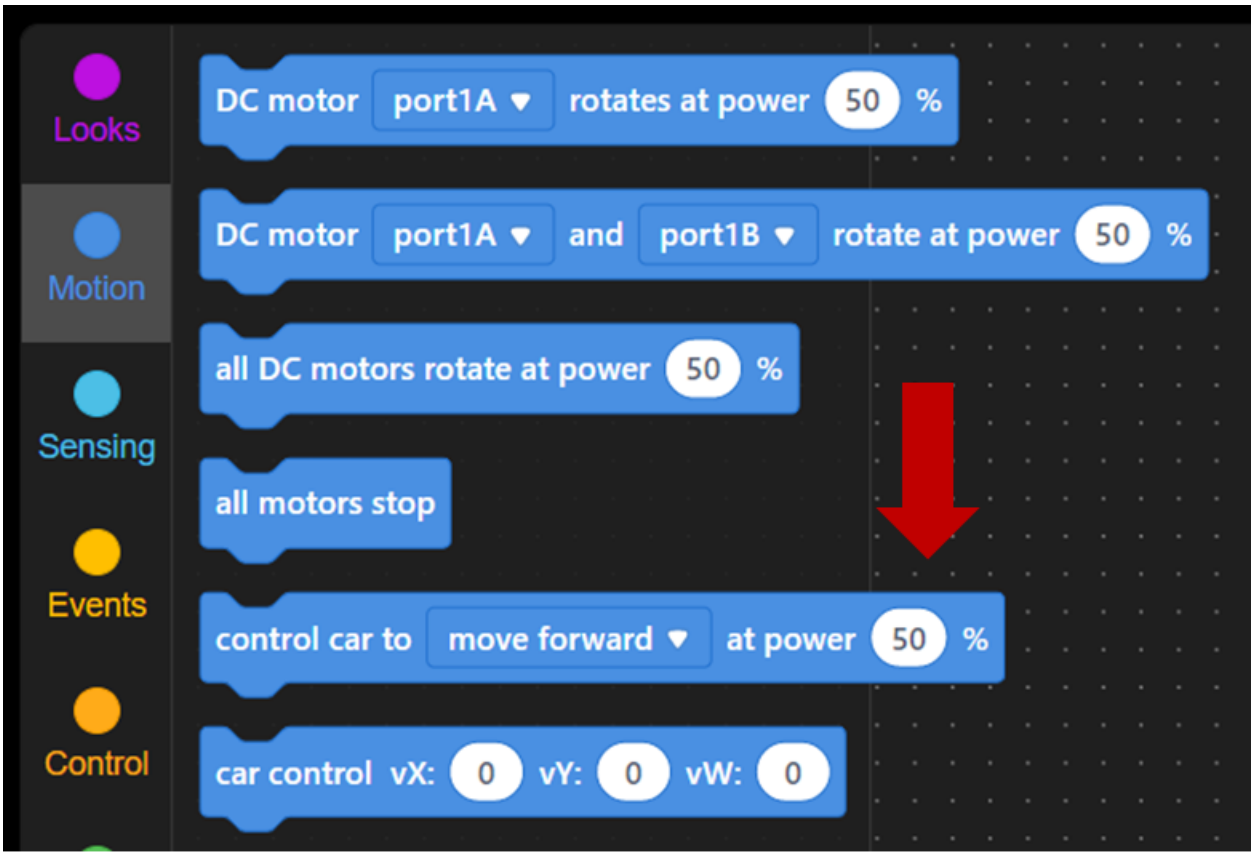

when mBot Mega (MegaPi) starts up
wait 1 seconds
forever
control car to move forward at power 50 %
RGB LED pin A14 sets all light color to
RGB LED pin A13 sets all light color to

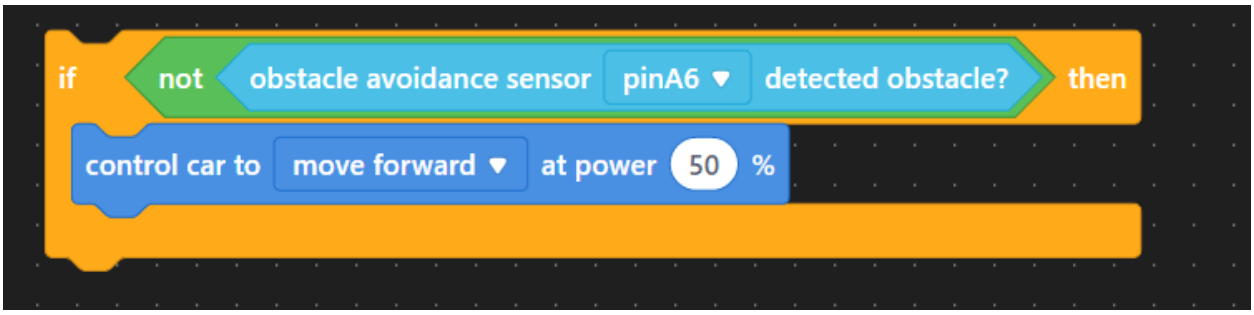

Looks
Motion
Sensing
Events
Control
Operators
wait 1 seconds
repeat 10
forever
if then

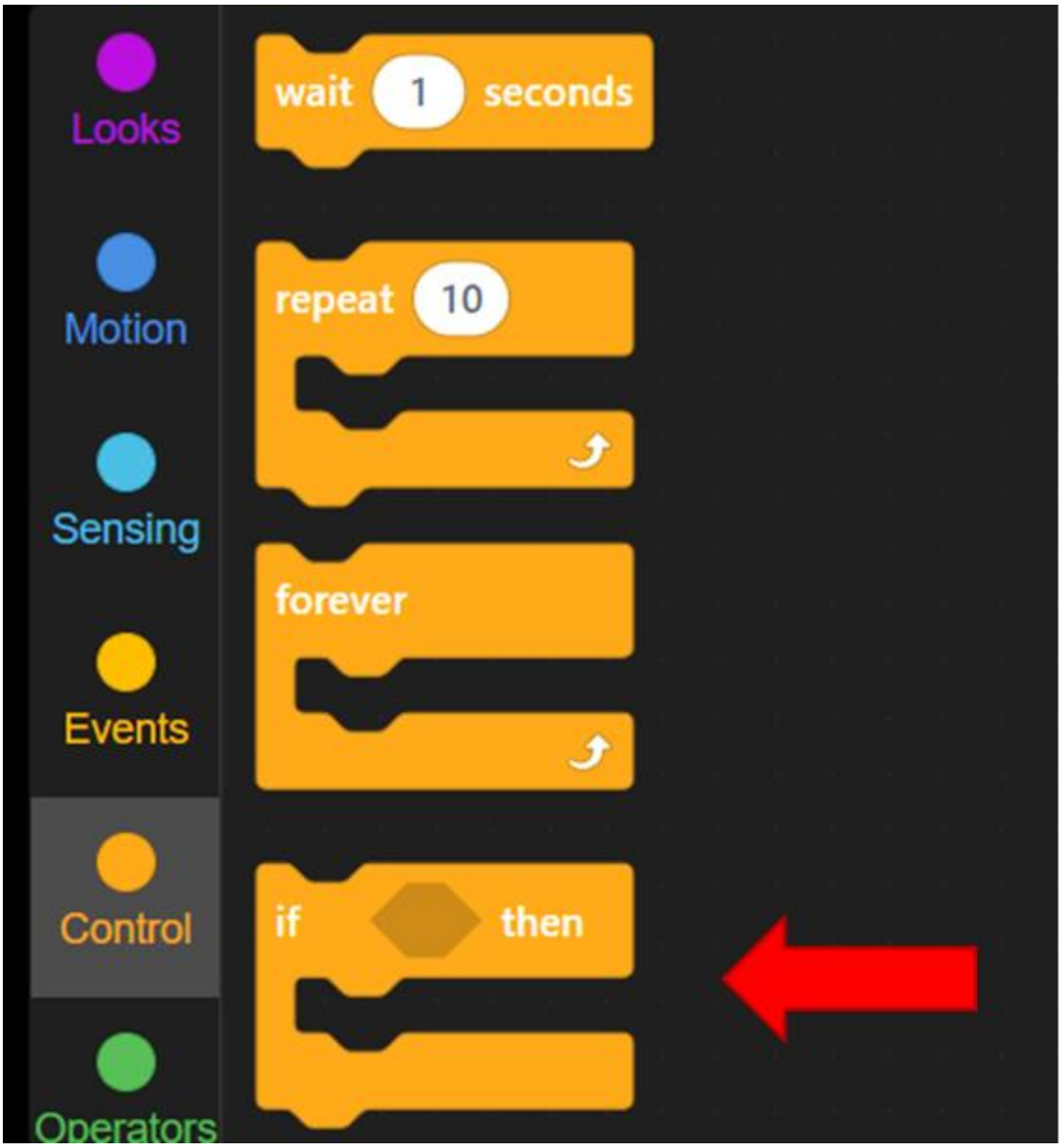

Operators
Variables
My Blocks
< 50
= 50
and
or
not

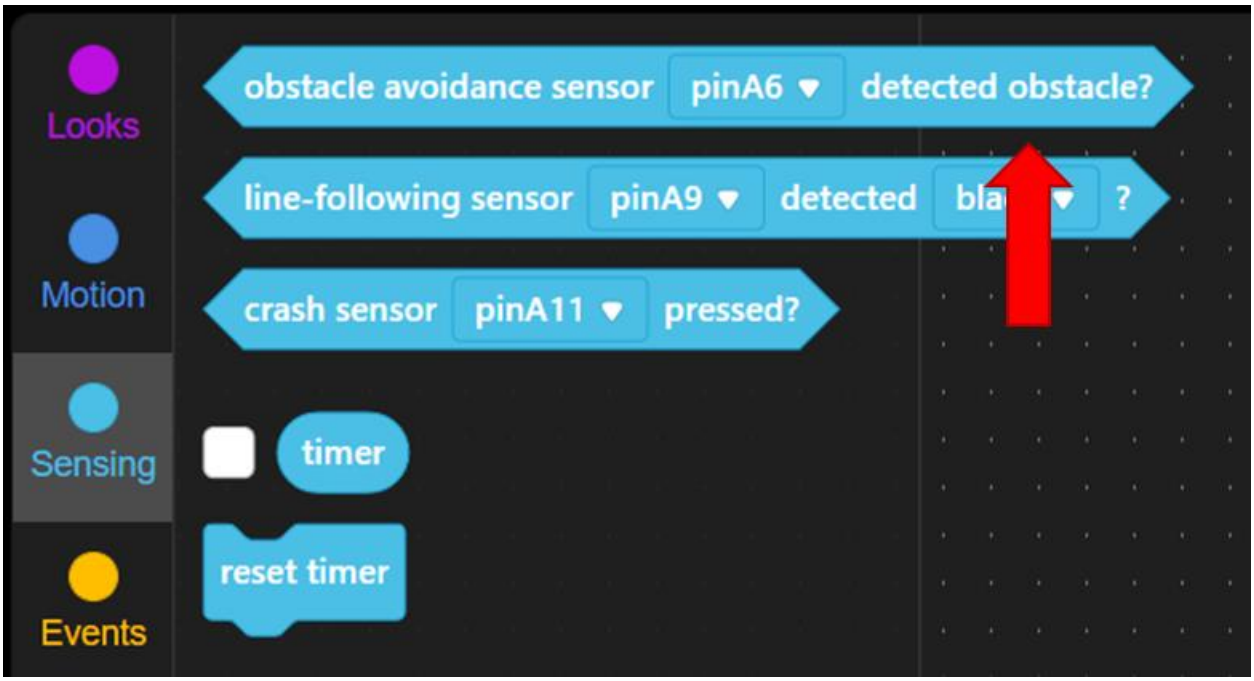

Looks
Motion
Sensing
Events
obstacle avoidance sensor pinA6 detected obstacle?
line-following sensor pinA9 detected
crash sensor pinA11 pressed?
timer
reset timer

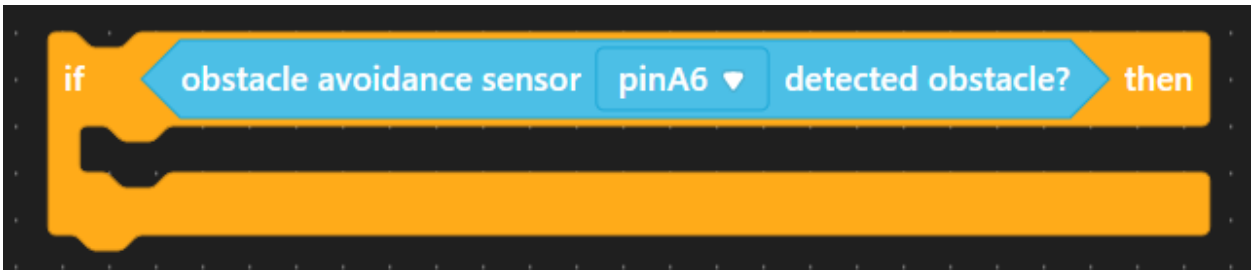

if
not
obstacle avoidance sensor pinA6 detected obstacle?
then


Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0

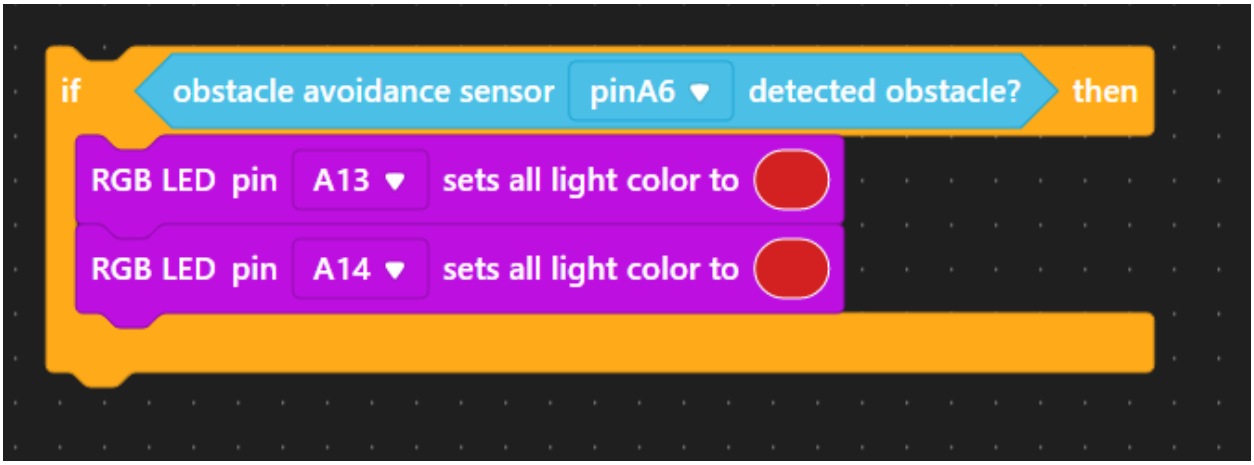

if not obstacle avoidance sensor pinA6 detected obstacle? then
control car to move forward at power 50 %

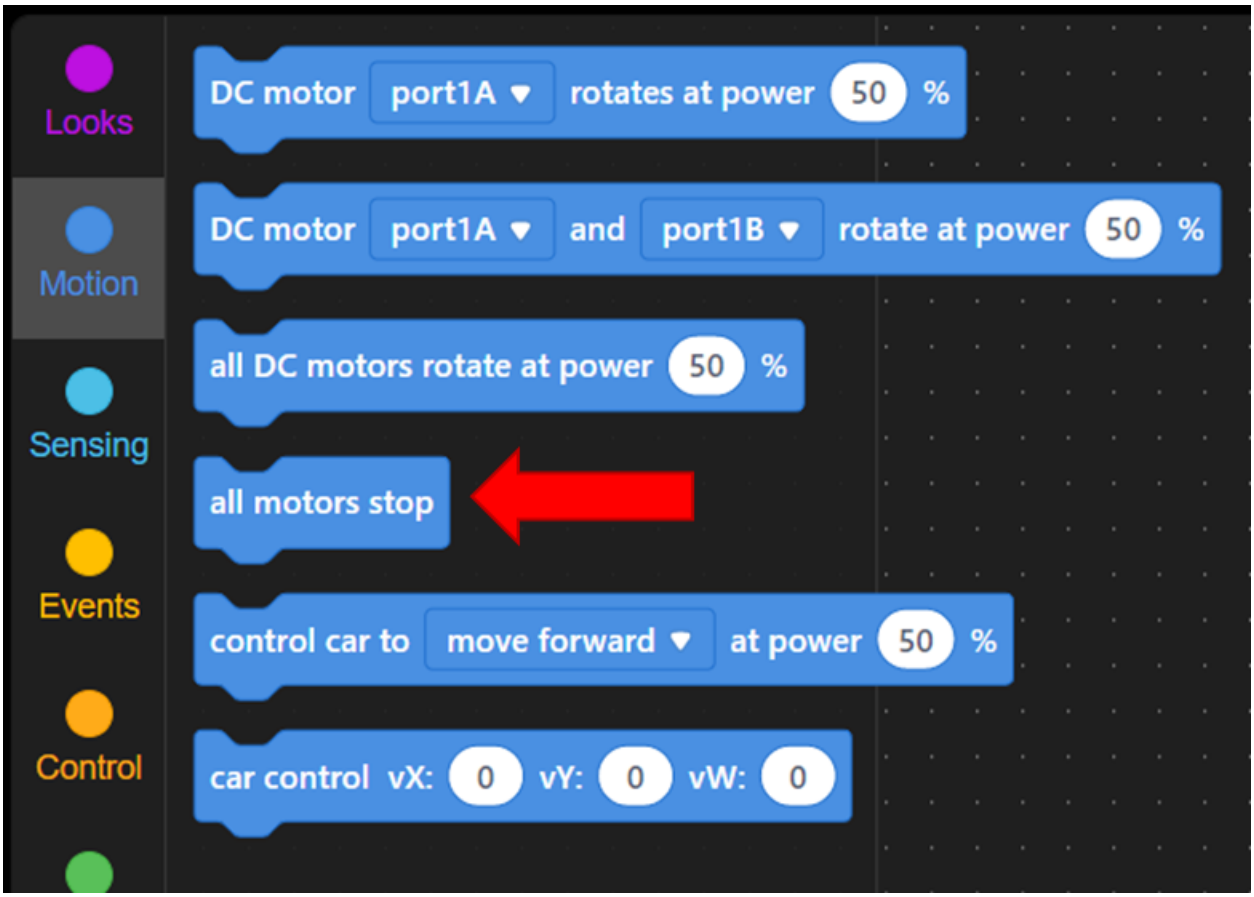

Looks
Motion
Sensing
Events
Control
Operators
wait 1 seconds
repeat 10
forever
if then

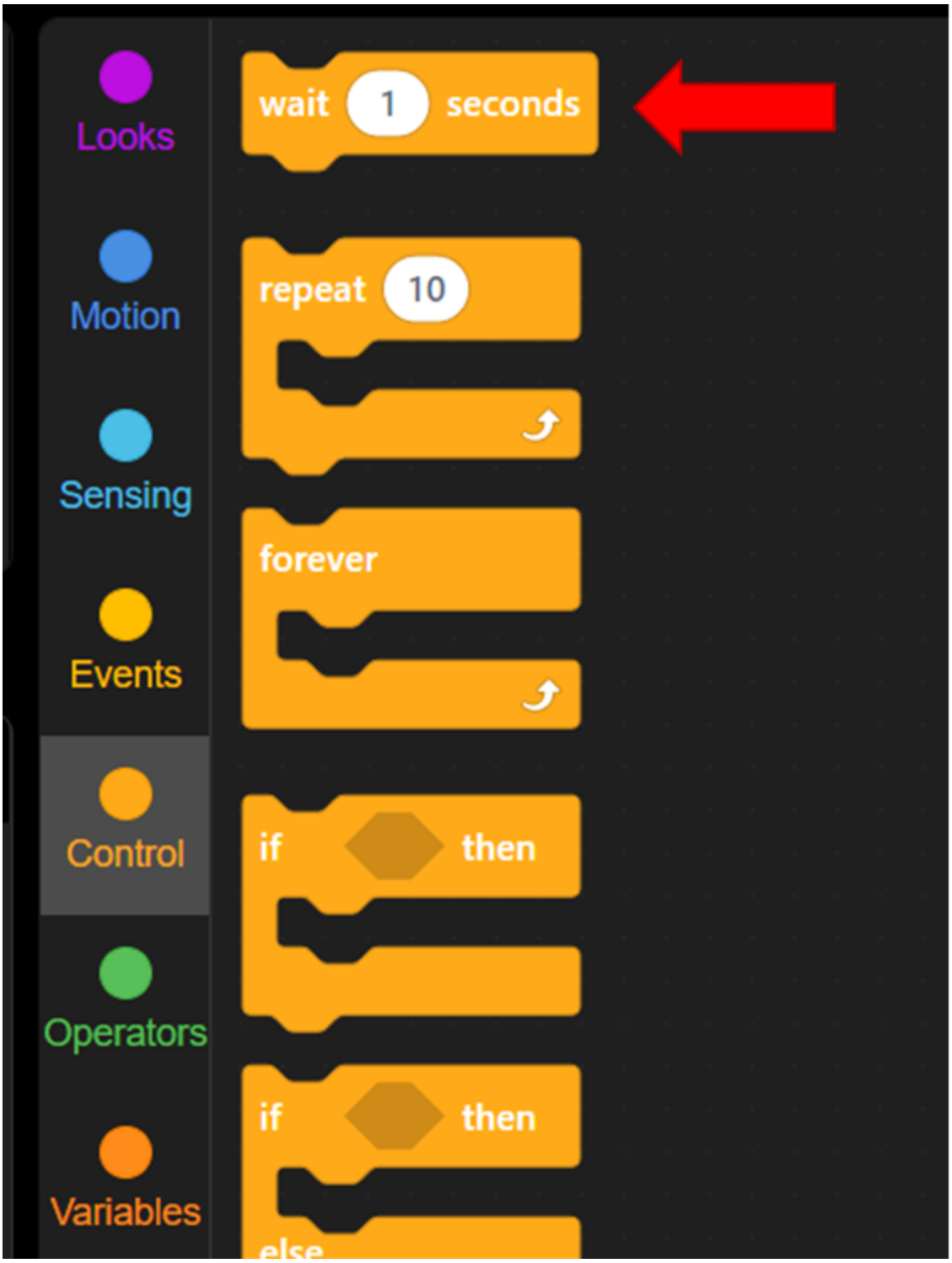

Looks
Motion
Sensing
Events
obstacle avoidance sensor pinA6 detected obstacle?
line-following sensor pinA9 detected
crash sensor pinA11 pressed?
timer
reset timer

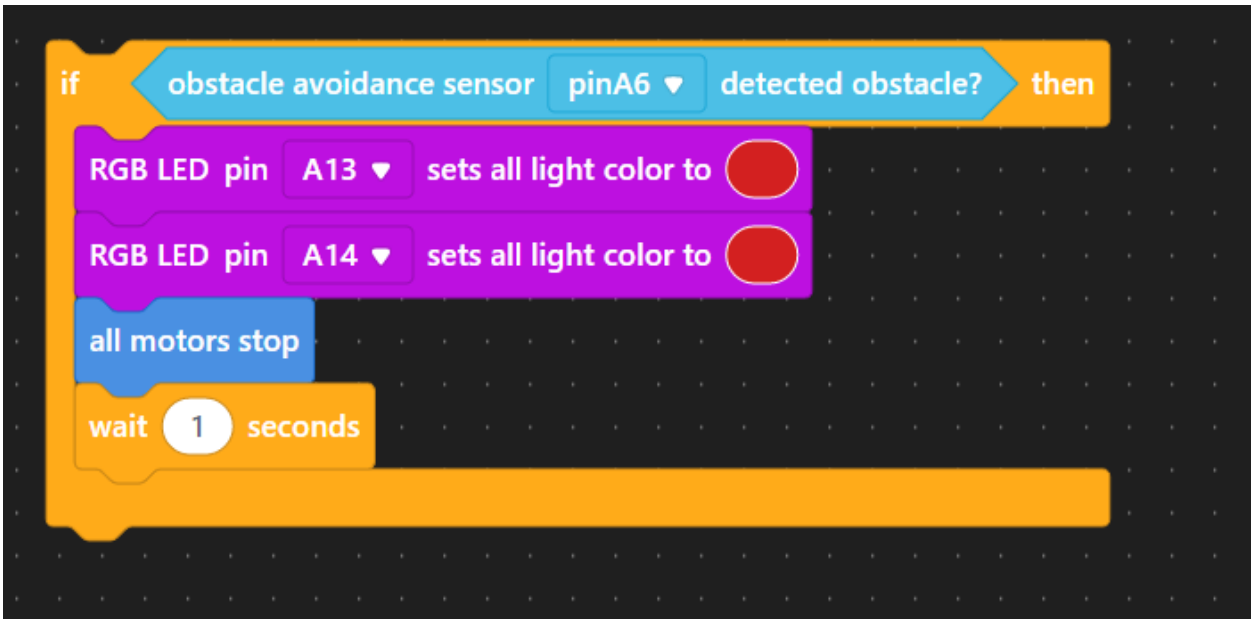

if
obstacle avoidance sensor pinA6 detected obstacle?
then

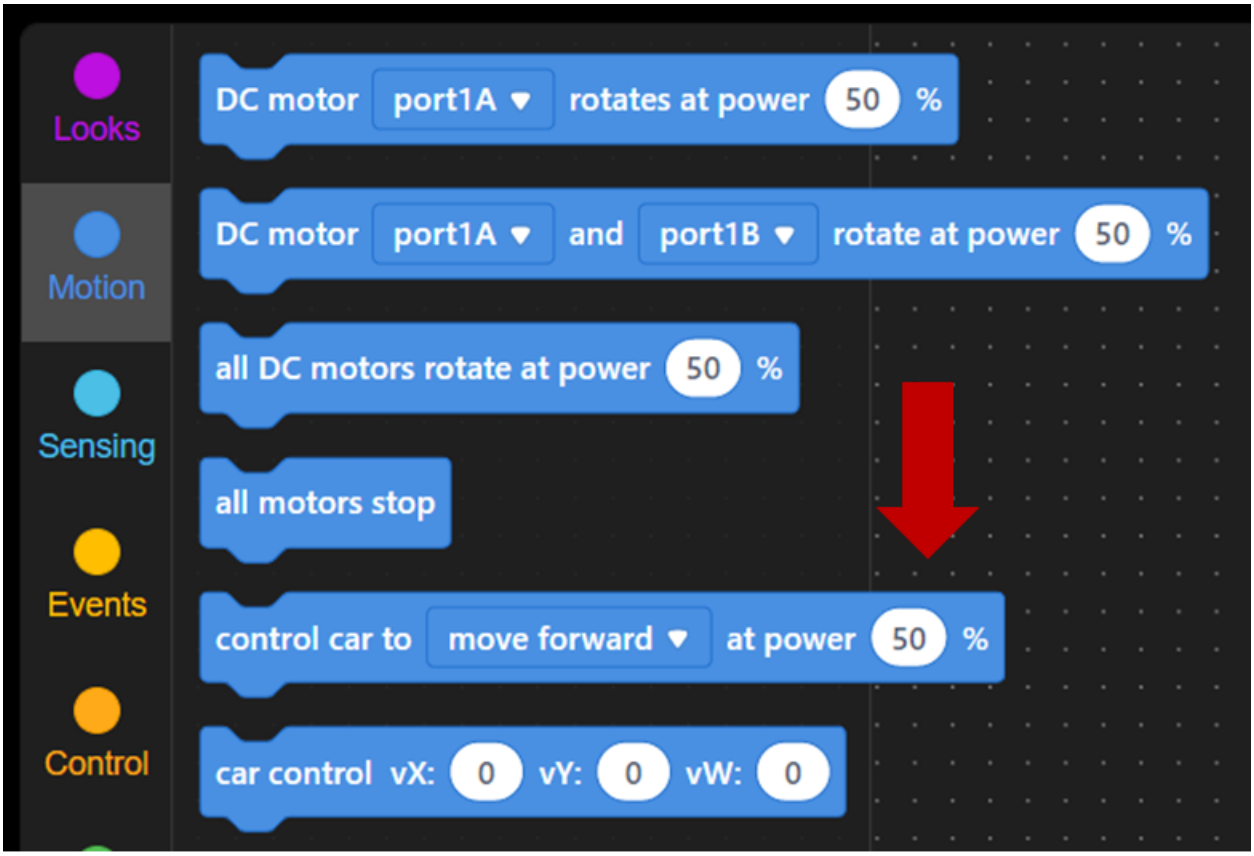

Looks
Motion
Sensing
Events
RGB LED pin A13 turns on bead 1 , color
RGB light pin A13 turns on bead 1 , color R 255 G 0 B 0
RGB LED pin A13 turns off bead 1
RGB LED pin A13 sets all light color to
RGB LED pin A13 sets all light color to R 255 G 0 B 0

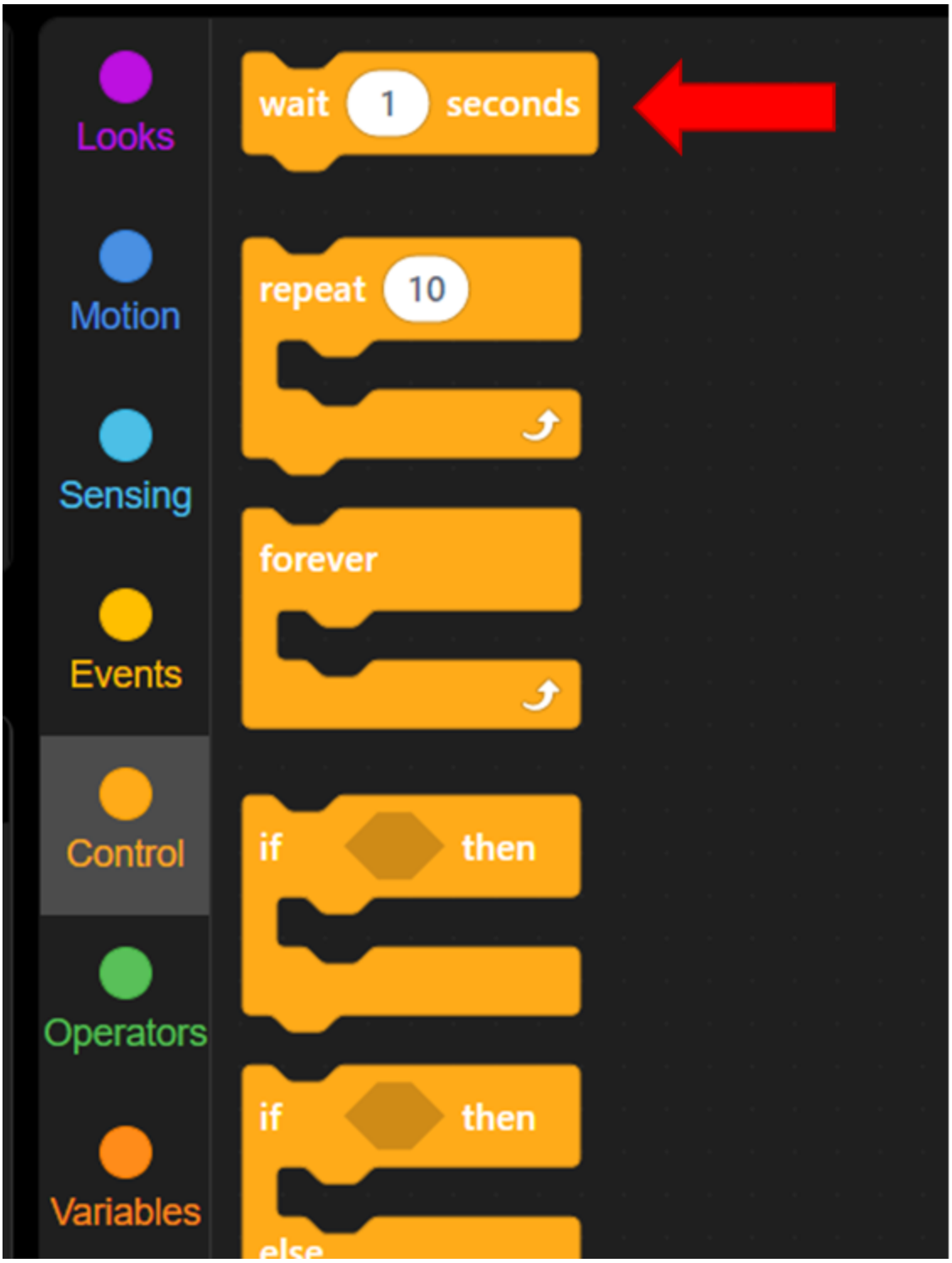

if obstacle avoidance sensor pinA6 detected obstacle? then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to

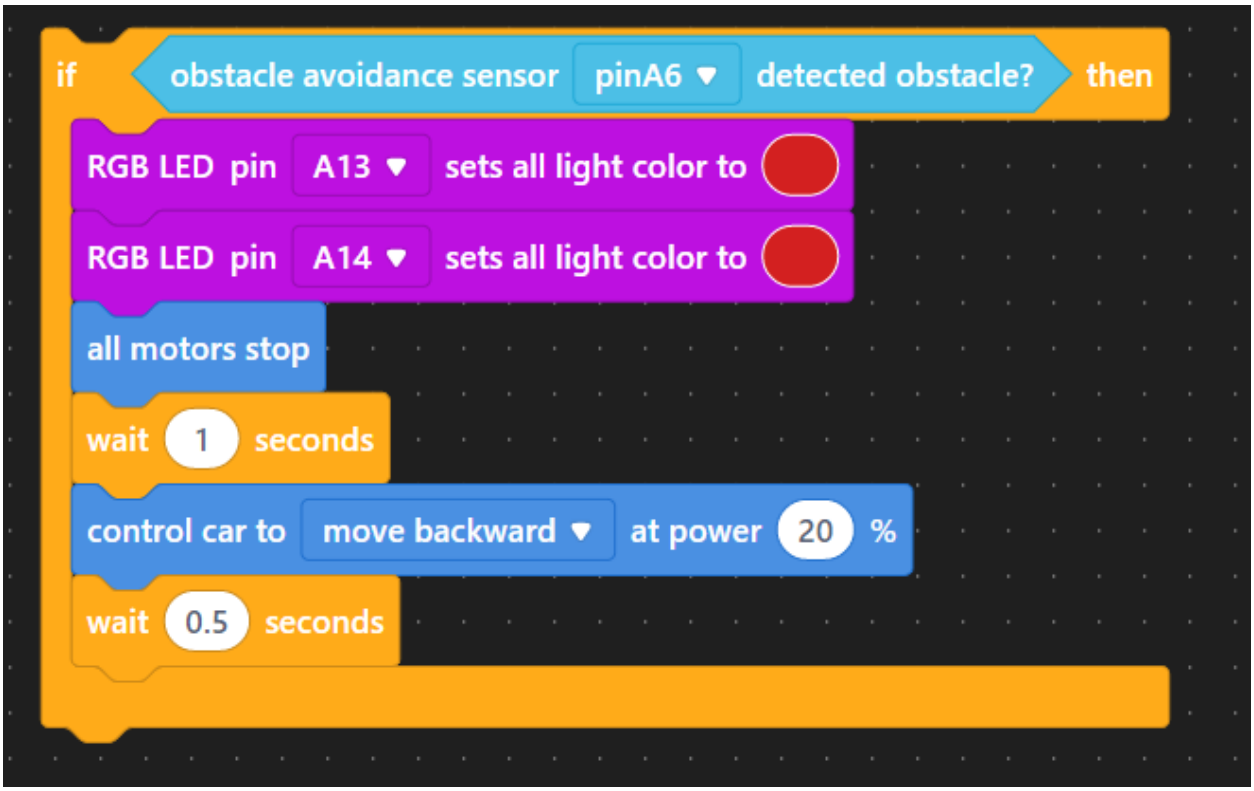

Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0

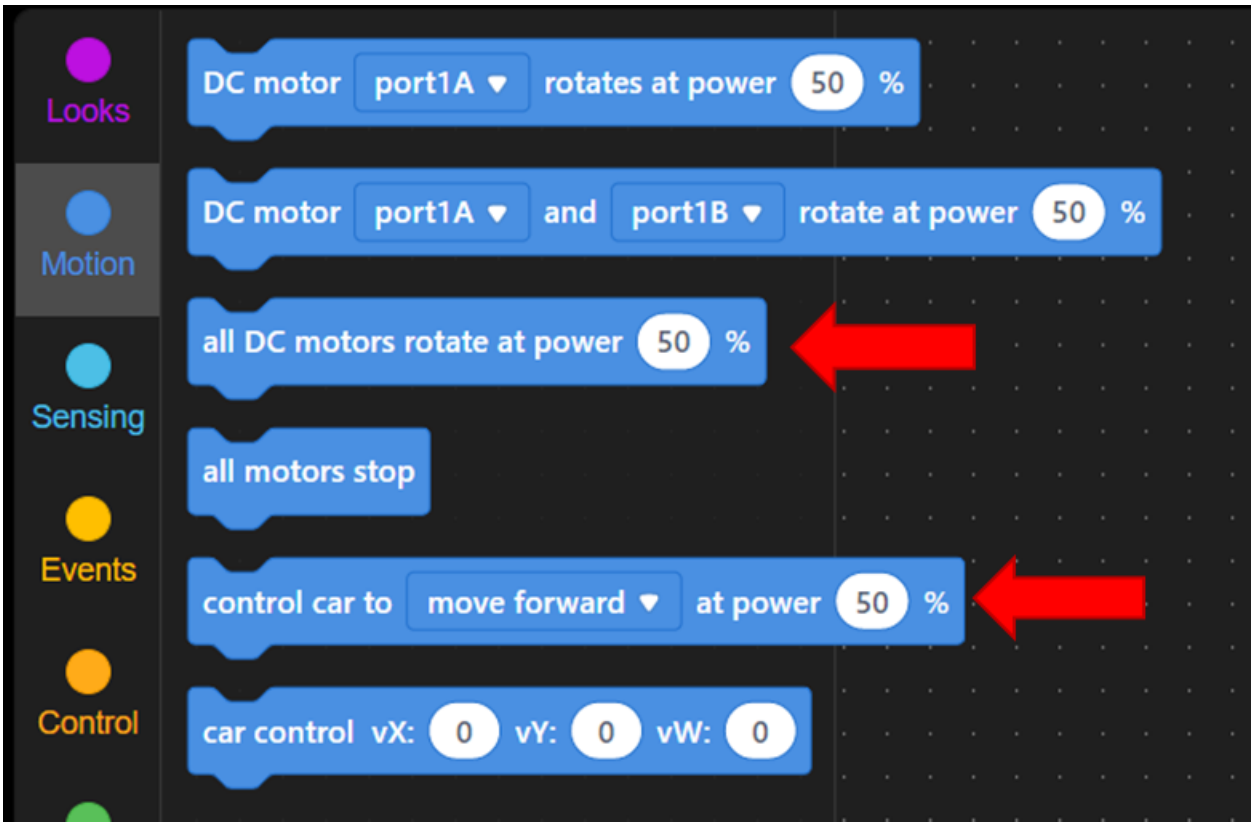

Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else

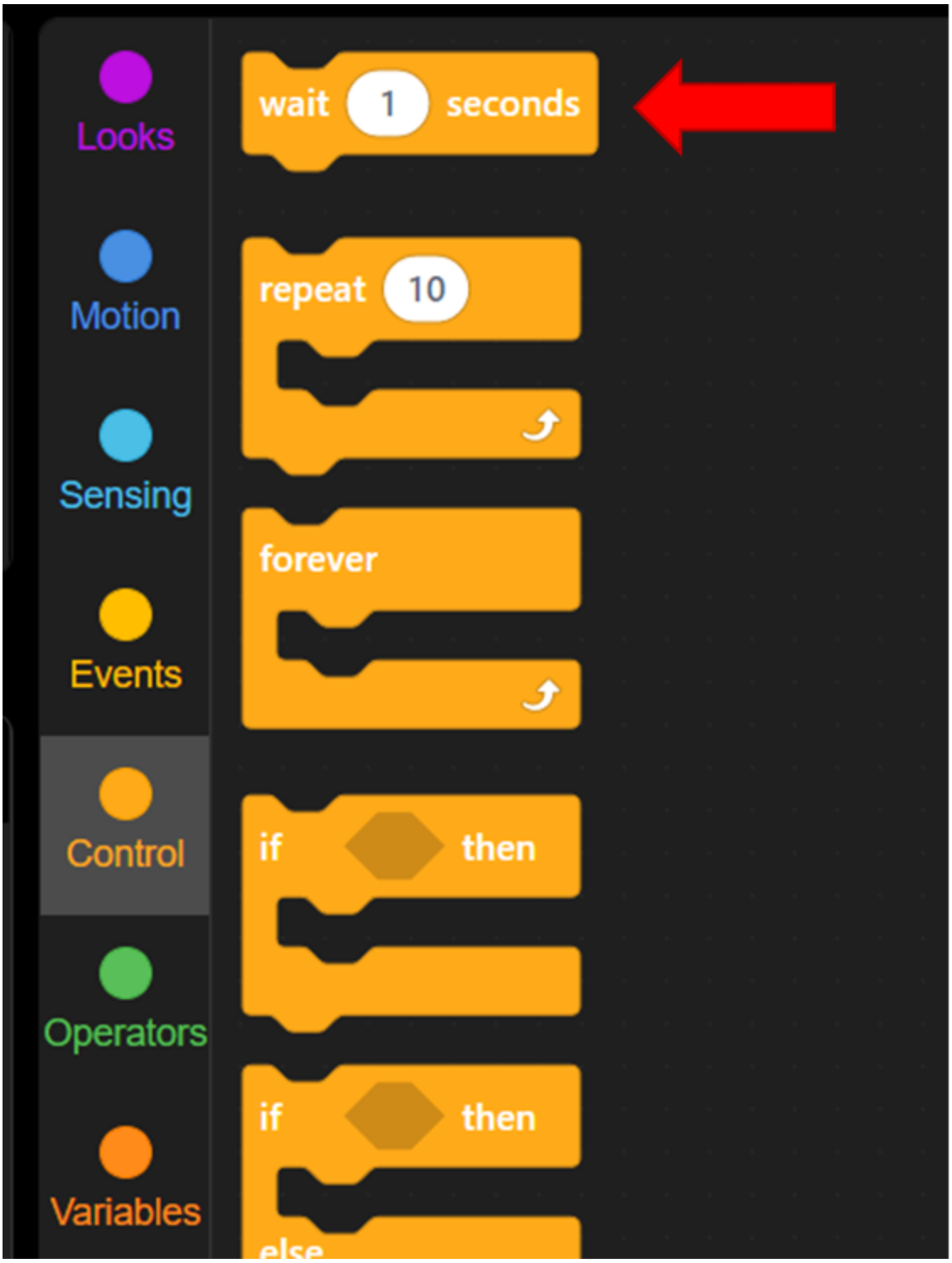

if
obstacle avoidance sensor pinA6 detected obstacle?
then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to
all motors stop
wait 1 seconds

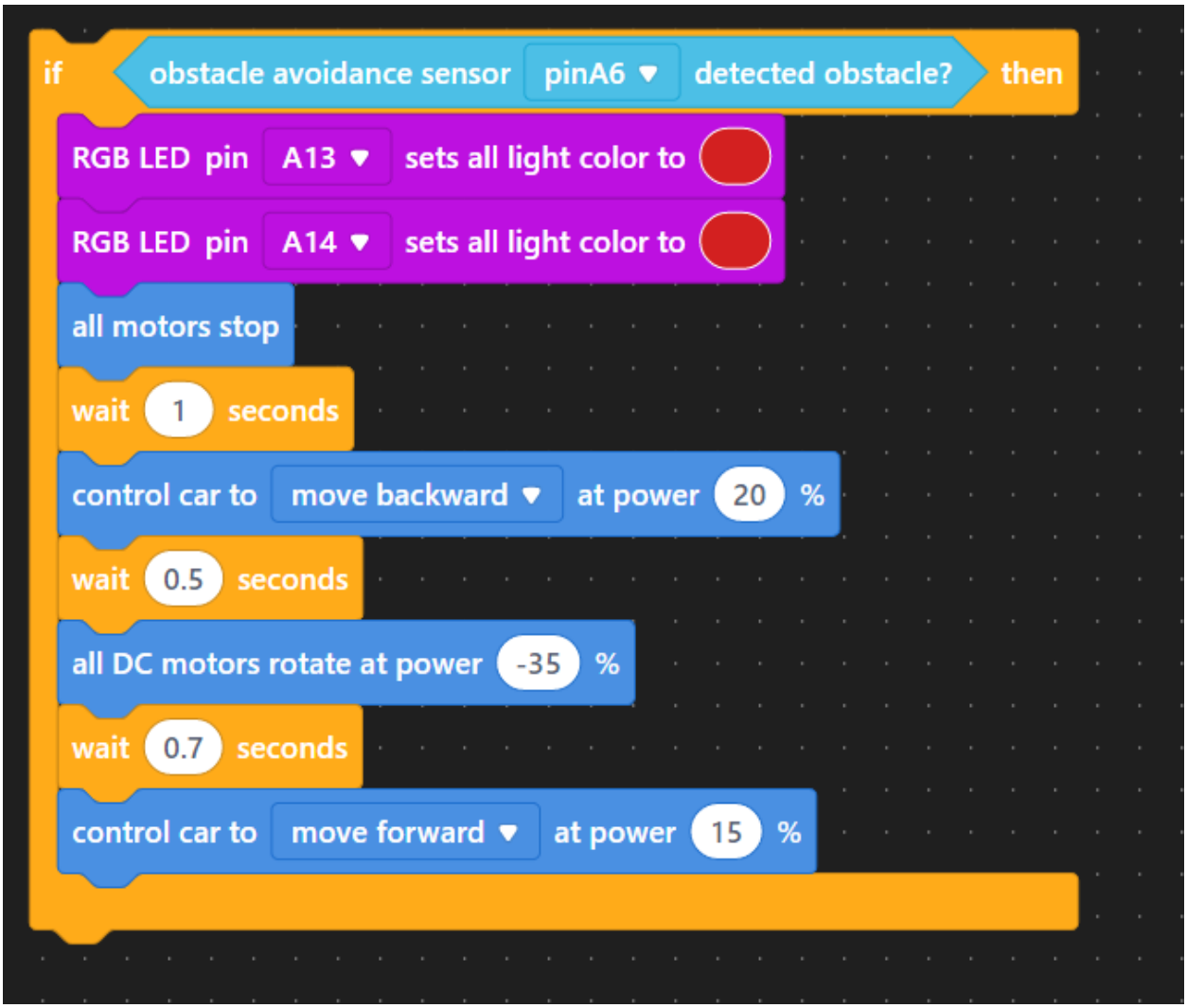

Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0


Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else

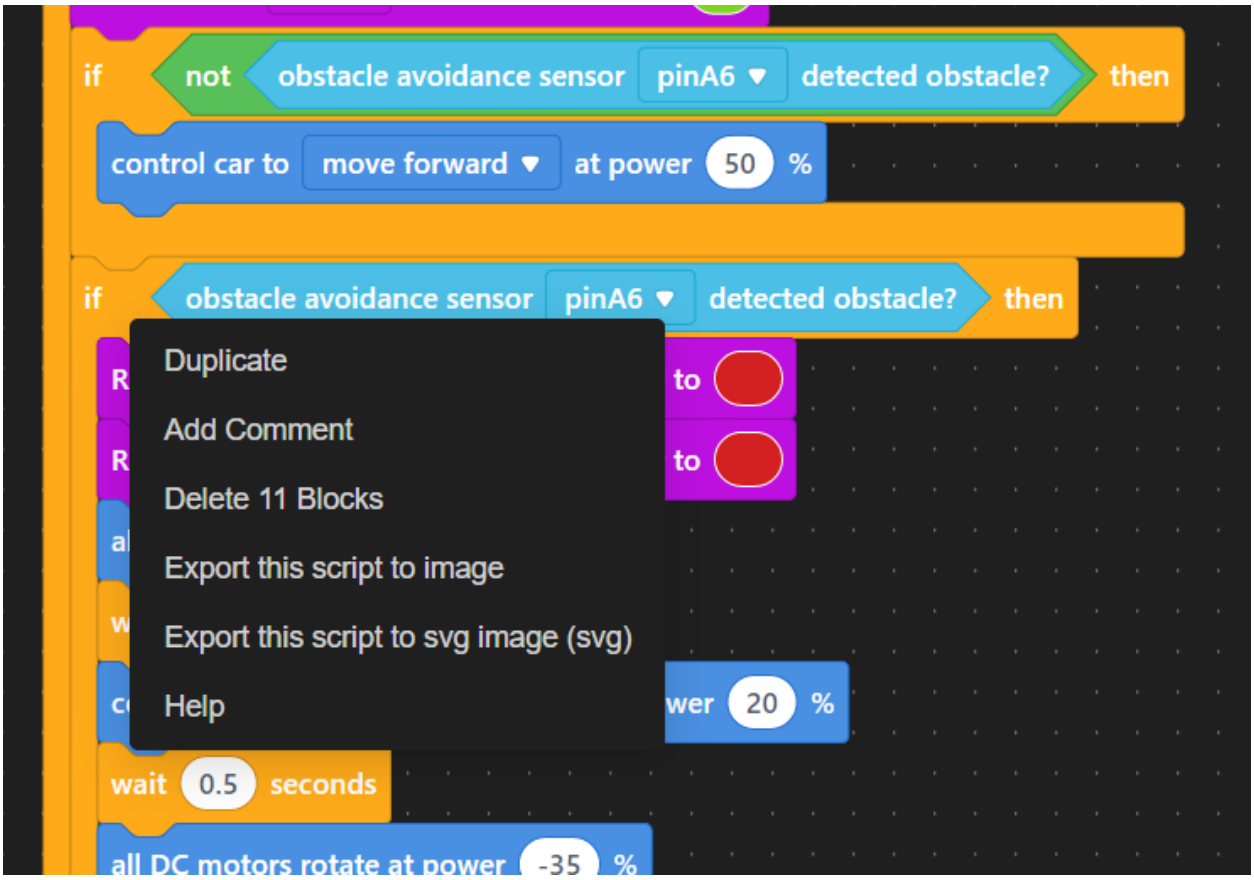

if
obstacle avoidance sensor pinA6 detected obstacle? then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to
all motors stop
wait 1 seconds
control car to move backward at power 20 %
wait 0.5 seconds

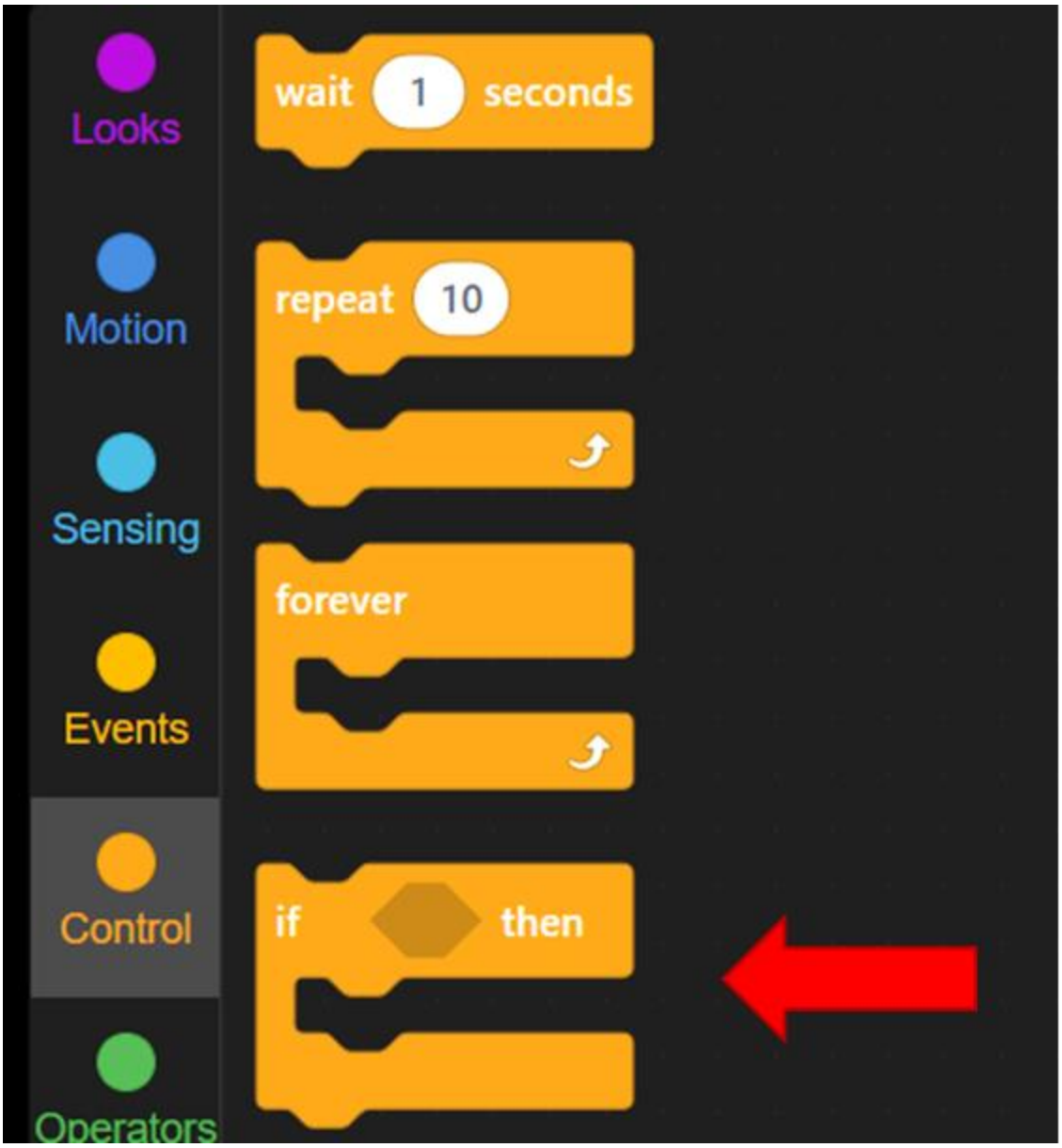

Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0

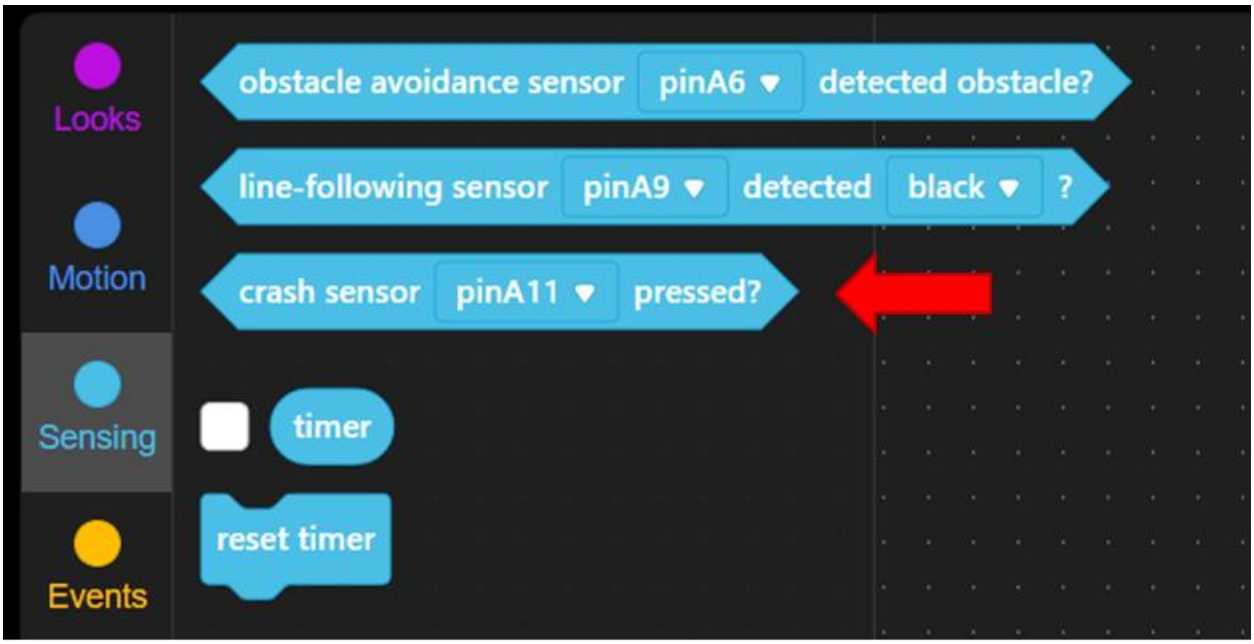

Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else

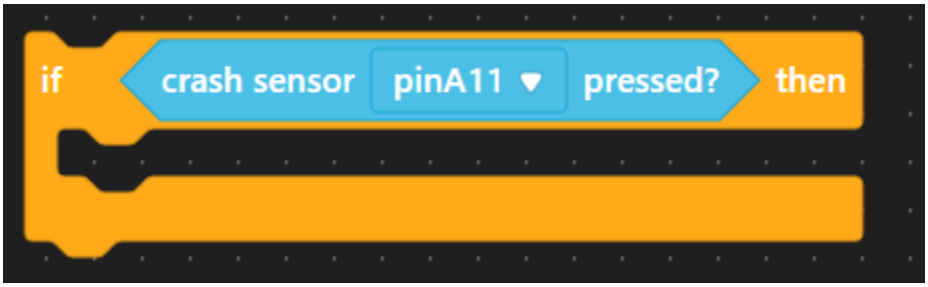


Duplicate both the if statements and change it to pinA8 by clicking right click and place it under the previously created if statements

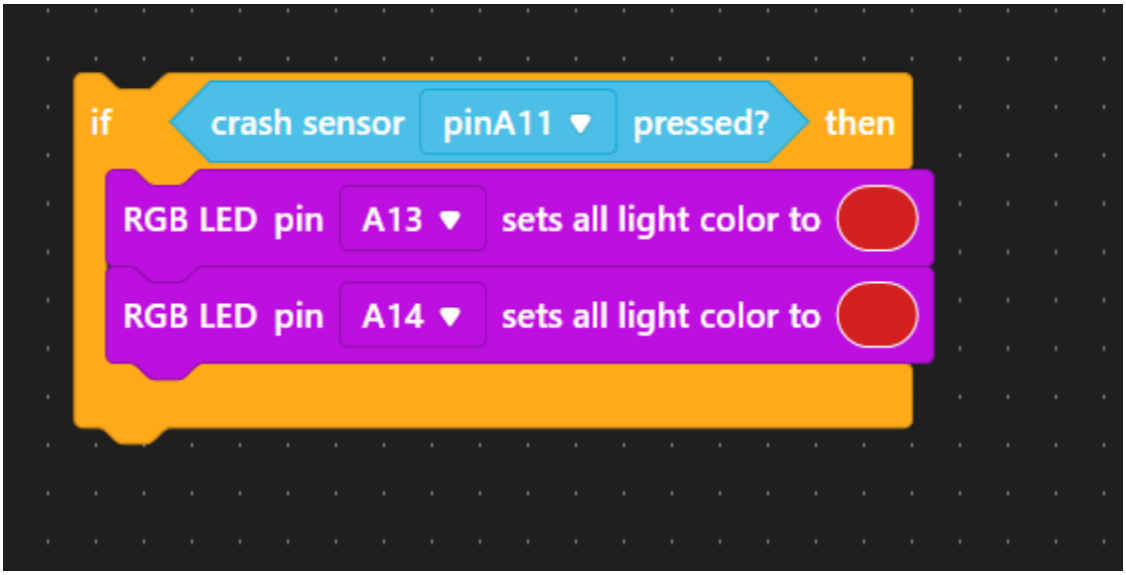

if not obstacle avoidance sensor pinA6 detected obstacle? then
control car to move forward at power 50 %
if obstacle avoidance sensor pinA6 detected obstacle? then
Duplicate
Add Comment
Delete 11 Blocks
Export this script to image
Export this script to svg image (svg)
Help
to
to
wer 20 %
wait 0.5 seconds
all DC motors rotate at power -35 %

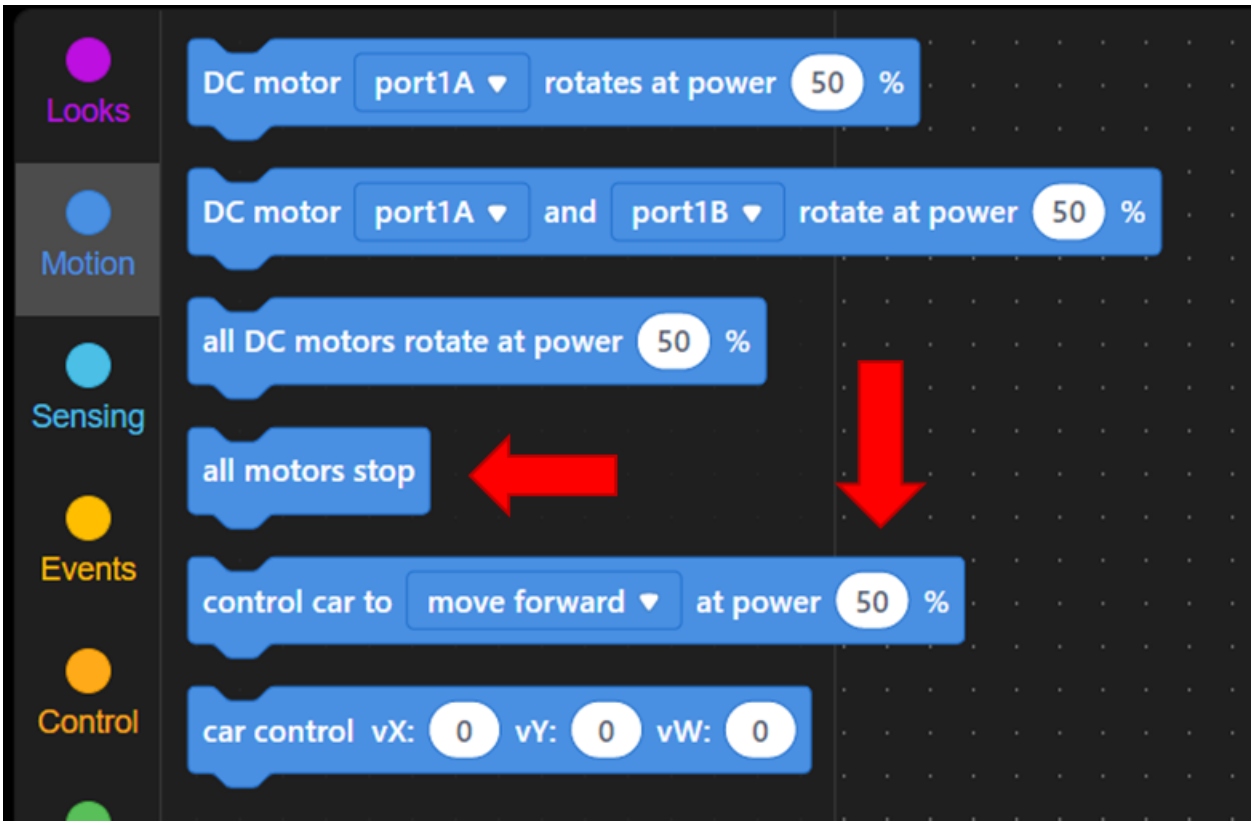

Looks
Motion
Sensing
Events
Control
Operators
wait 1 seconds
repeat 10
forever
if then

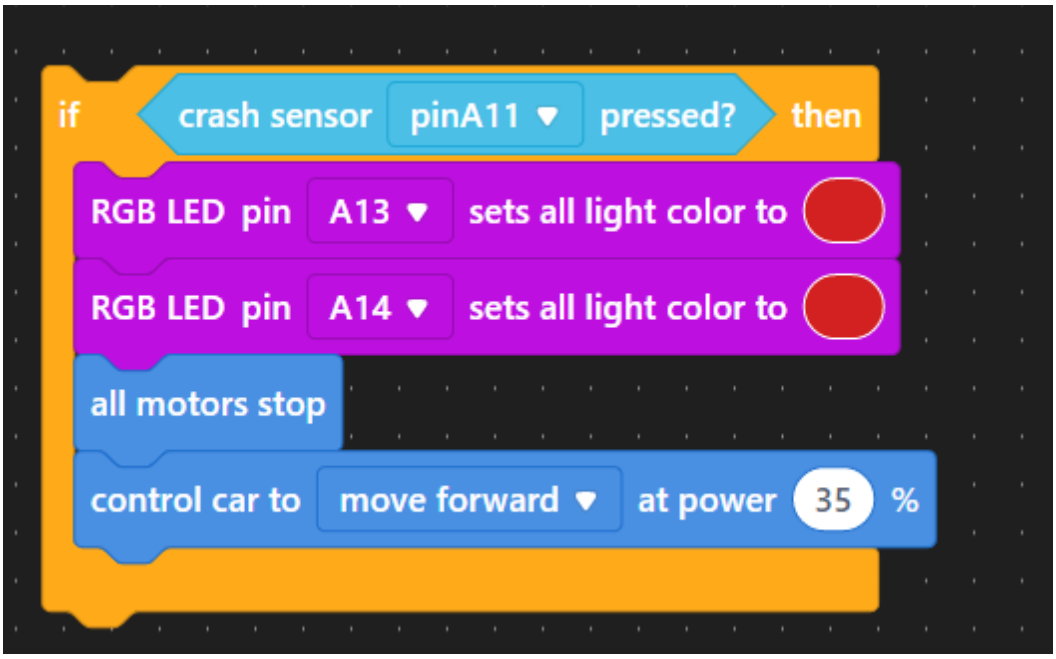

Looks
Motion
Sensing
Events
obstacle avoidance sensor pinA6 detected obstacle?
line-following sensor pinA9 detected black ?
crash sensor pinA11 pressed?
timer
reset timer

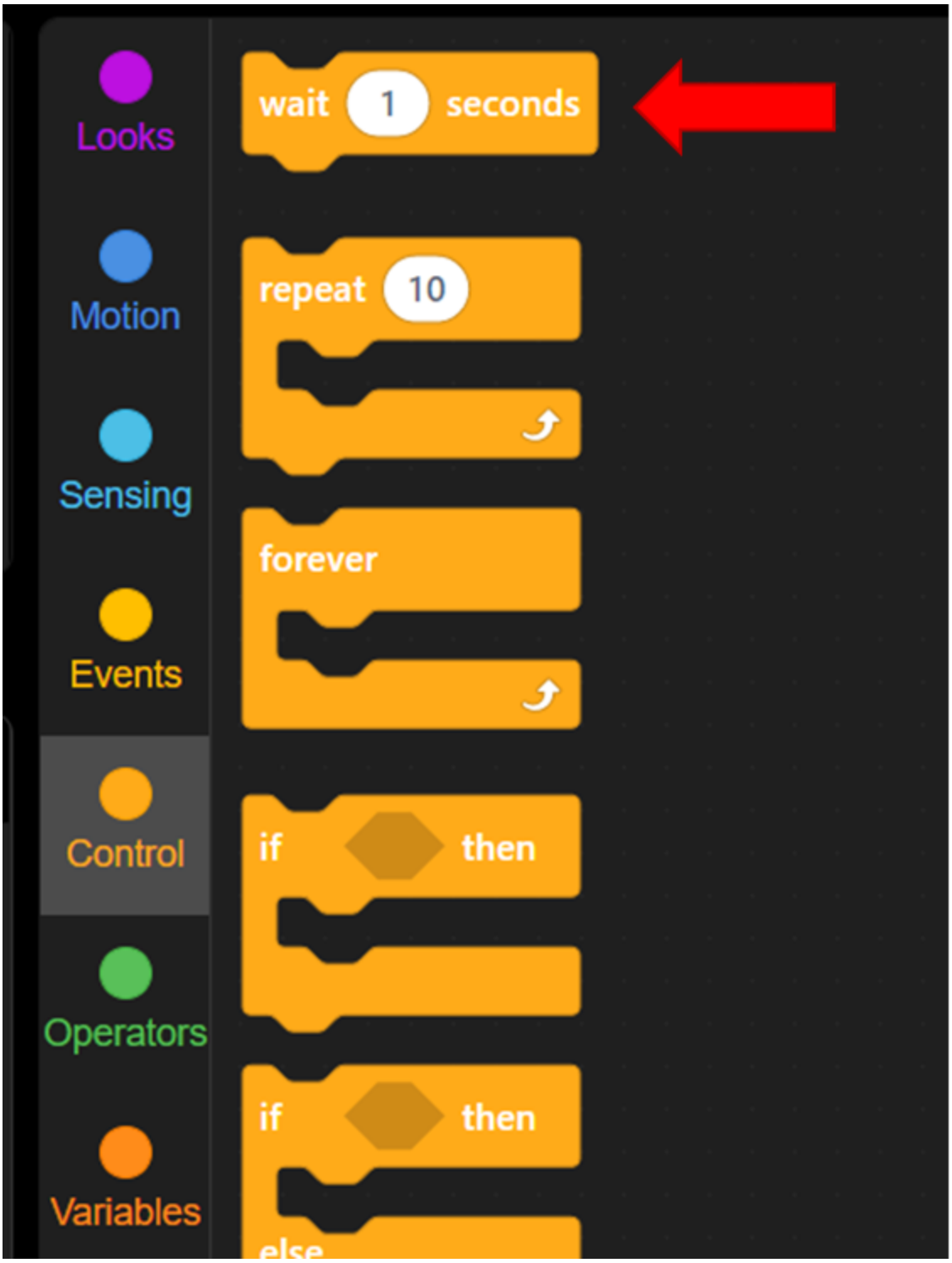

if
crash sensor pinA11 pressed?
then

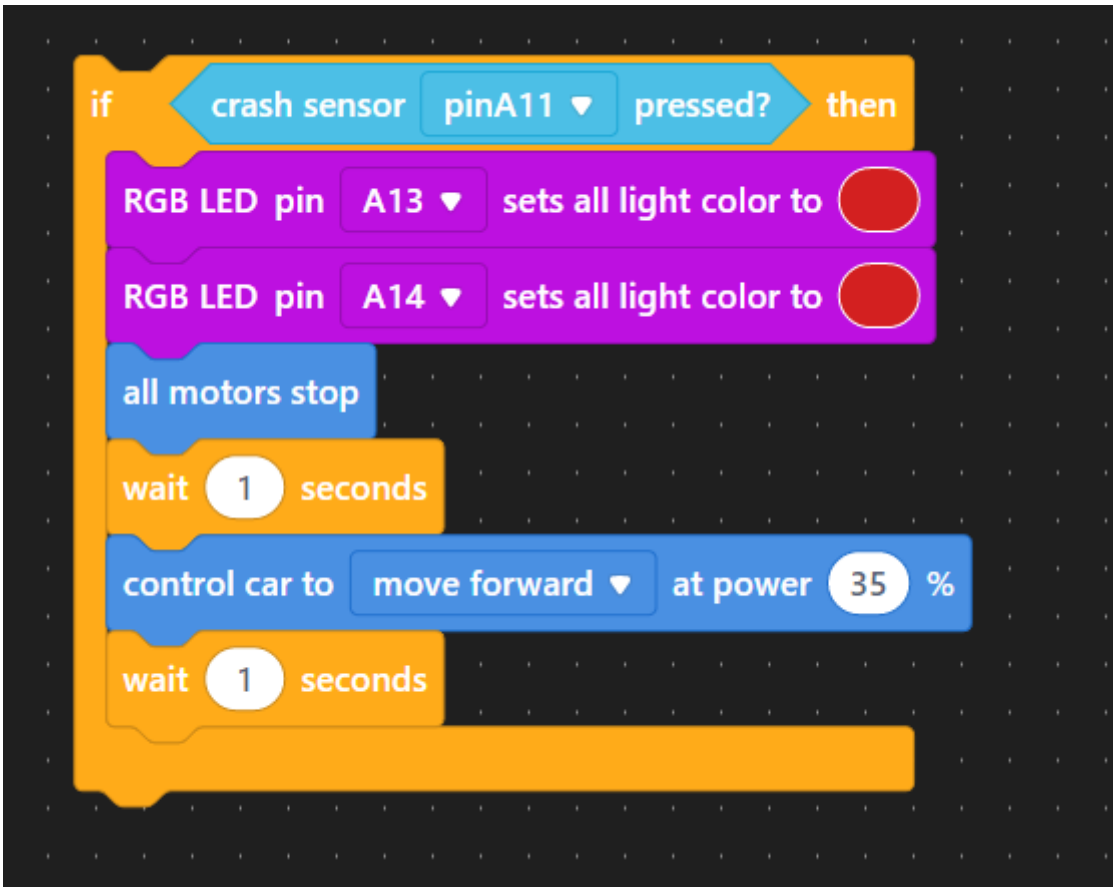

Looks
Motion
Sensing
Events
RGB LED pin A13 turns on bead 1 , color
RGB light pin A13 turns on bead 1 , color R 255 G 0 B 0
RGB LED pin A13 turns off bead 1
RGB LED pin A13 sets all light color to
RGB LED pin A13 sets all light color to R 255 G 0 B 0


if crash sensor pinA11 pressed? then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to

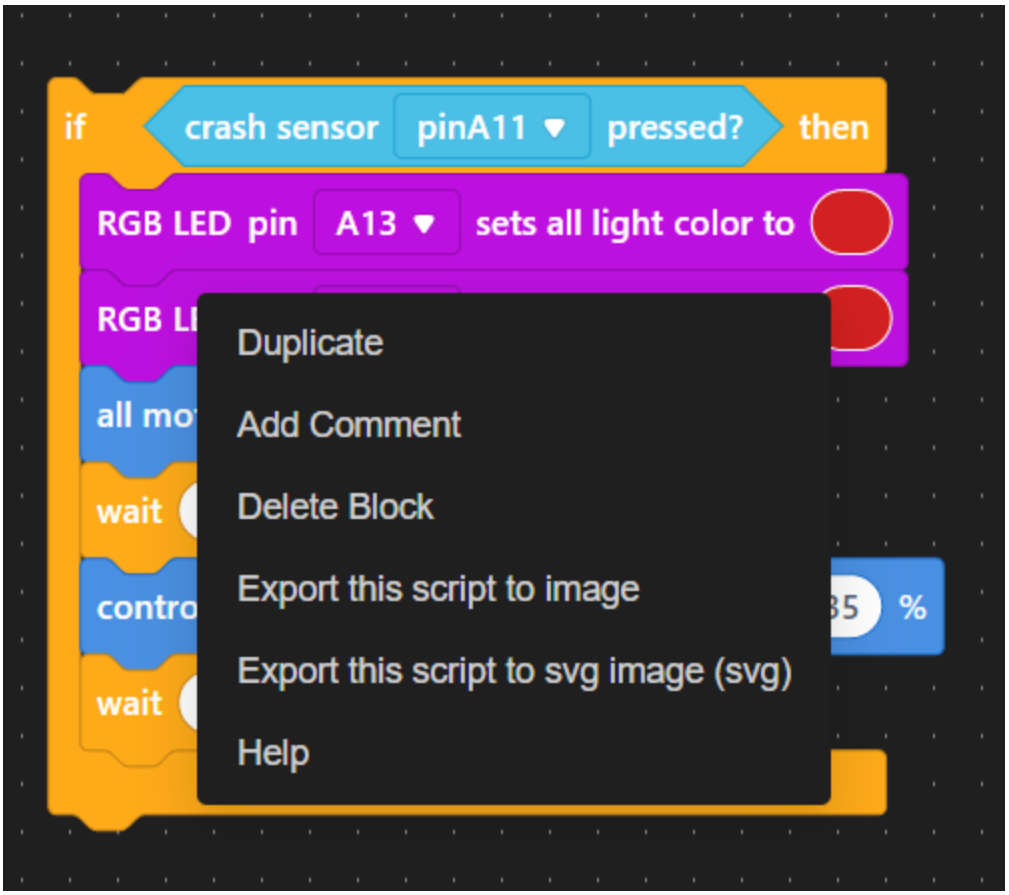

Looks
Motion
Sensing
Events
Control
DC motor port1A rotates at power 50 %
DC motor port1A and port1B rotate at power 50 %
all DC motors rotate at power 50 %
all motors stop
control car to move forward at power 50 %
car control vX: 0 vY: 0 vW: 0


if
crash sensor pinA11 pressed?
then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to
all motors stop
control car to move forward at power 35 %

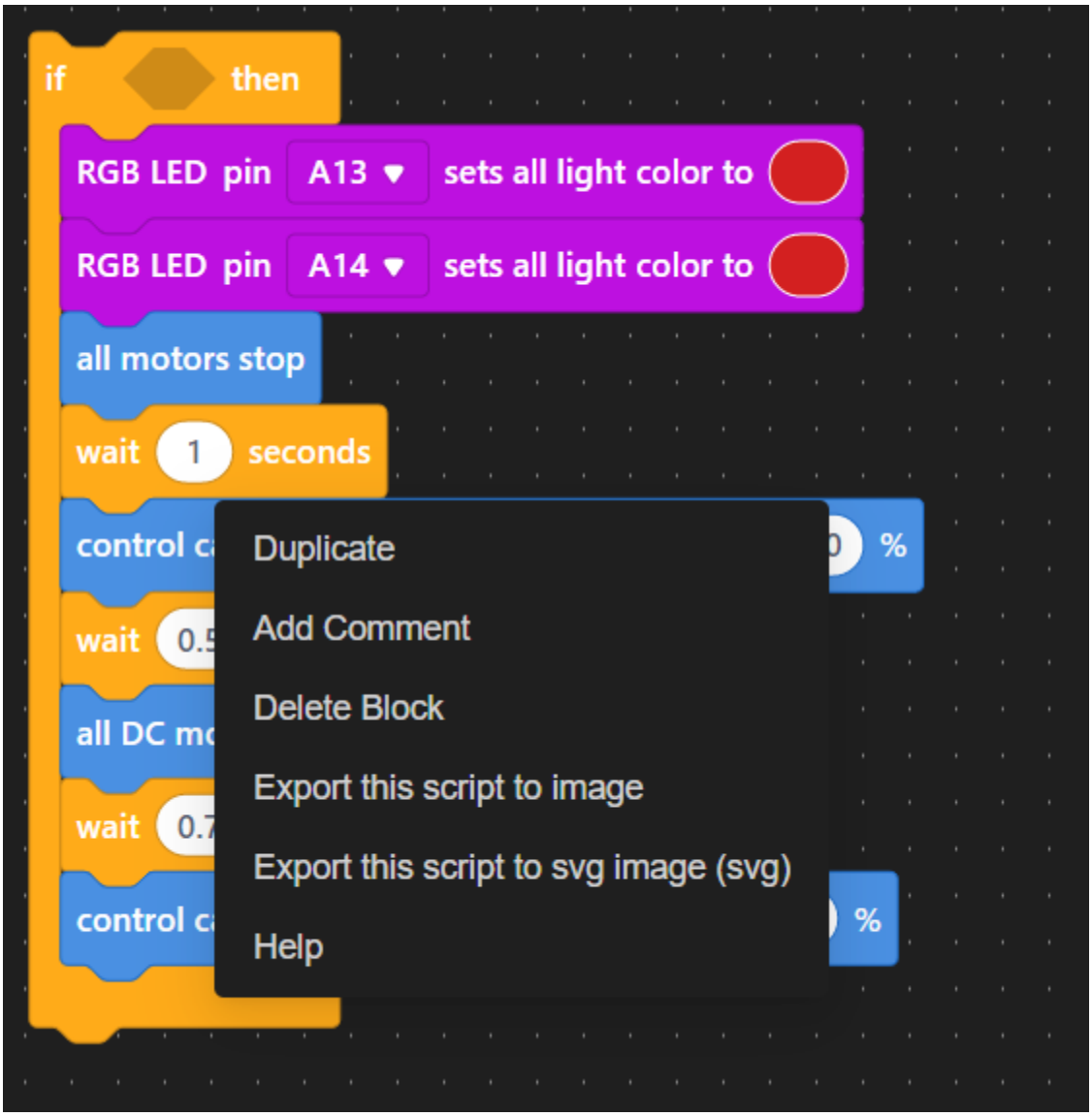

Looks
Motion
Sensing
Events
Control
Operators
Variables
wait 1 seconds
repeat 10
forever
if then
if then
else



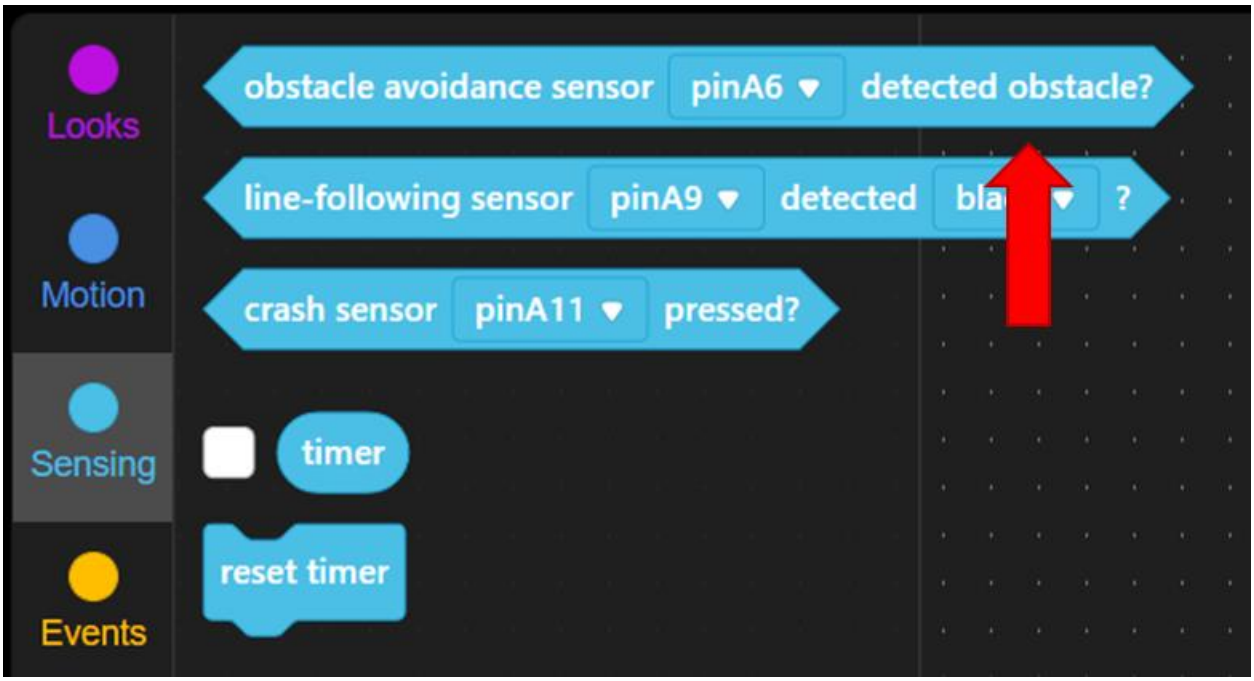
Duplicate it again by clicking right click. Set it for pinA12

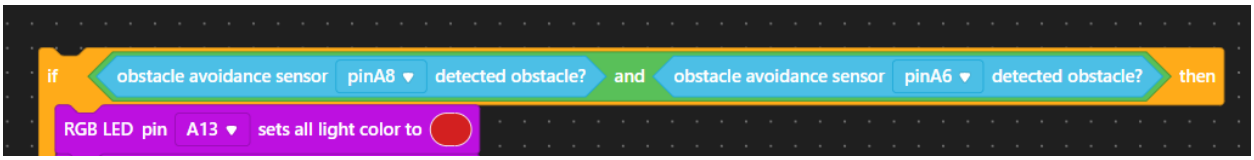


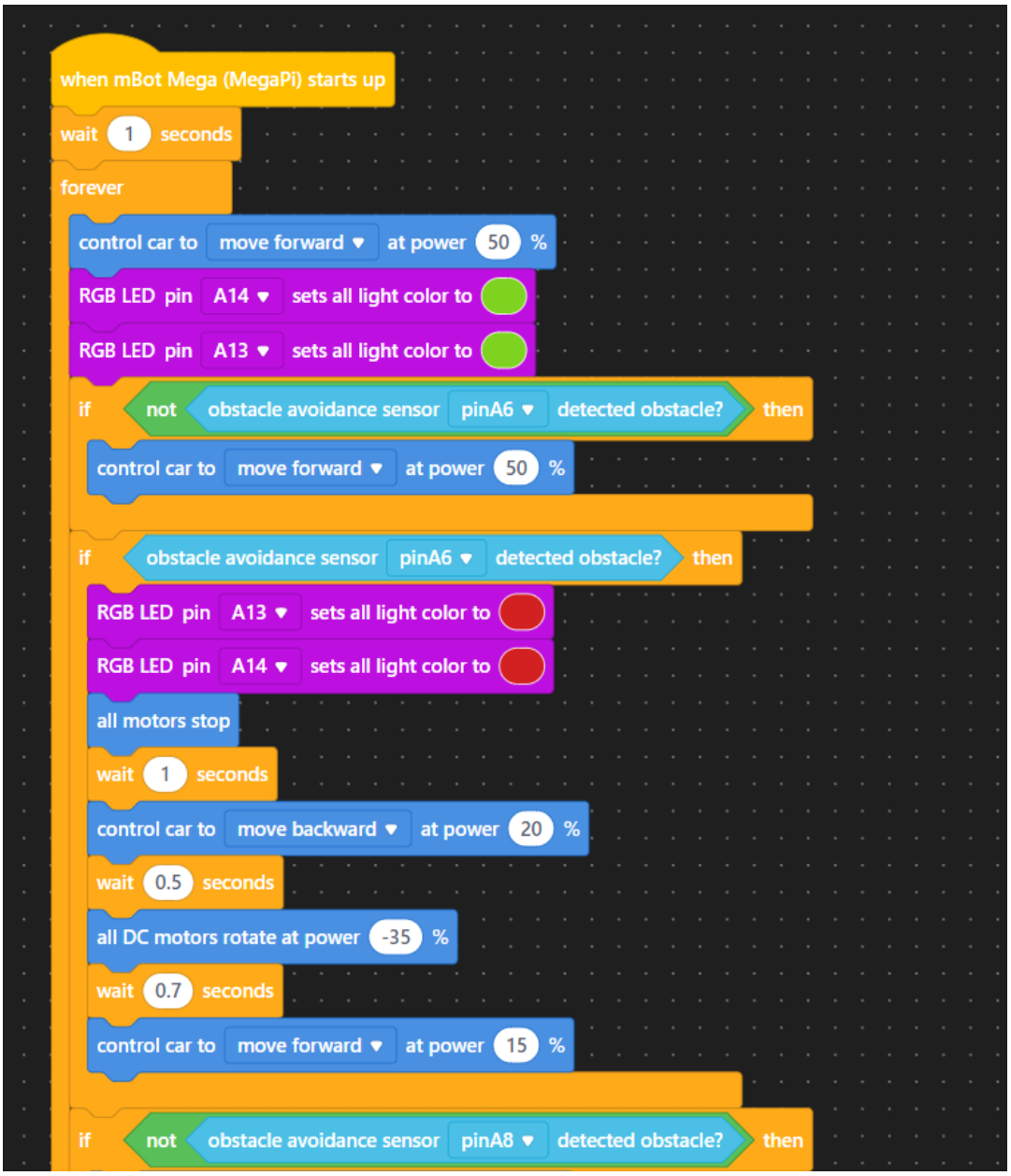
Duplicate the two first if statements we created by clicking right click and dragging them to the bottom

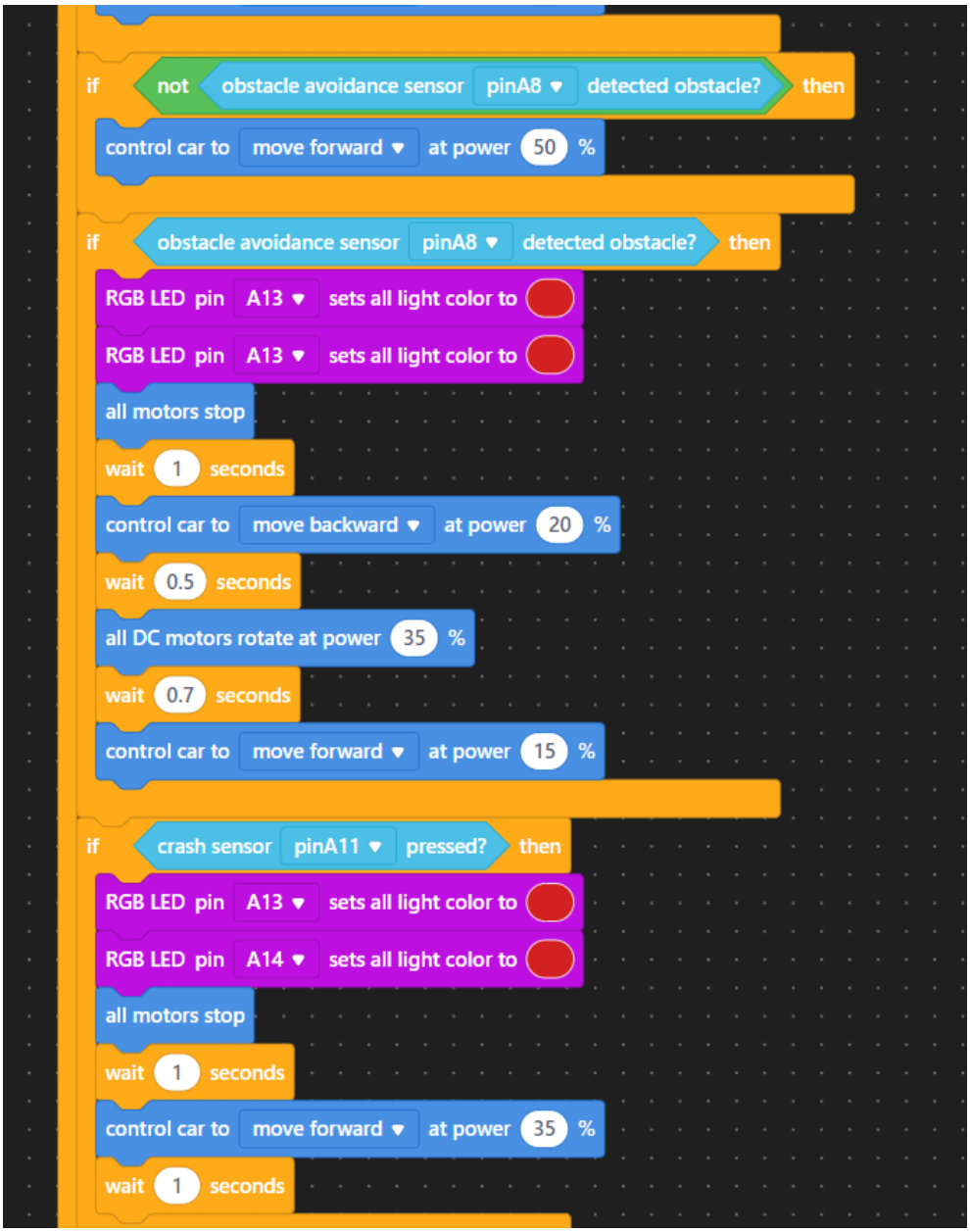

if
then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to
all motors stop
wait 1 seconds
control c
%
wait 0.5
all DC mo
wait 0.7
control c
%
Duplicate
Add Comment
Delete Block
Export this script to image
Export this script to svg image (svg)
Help

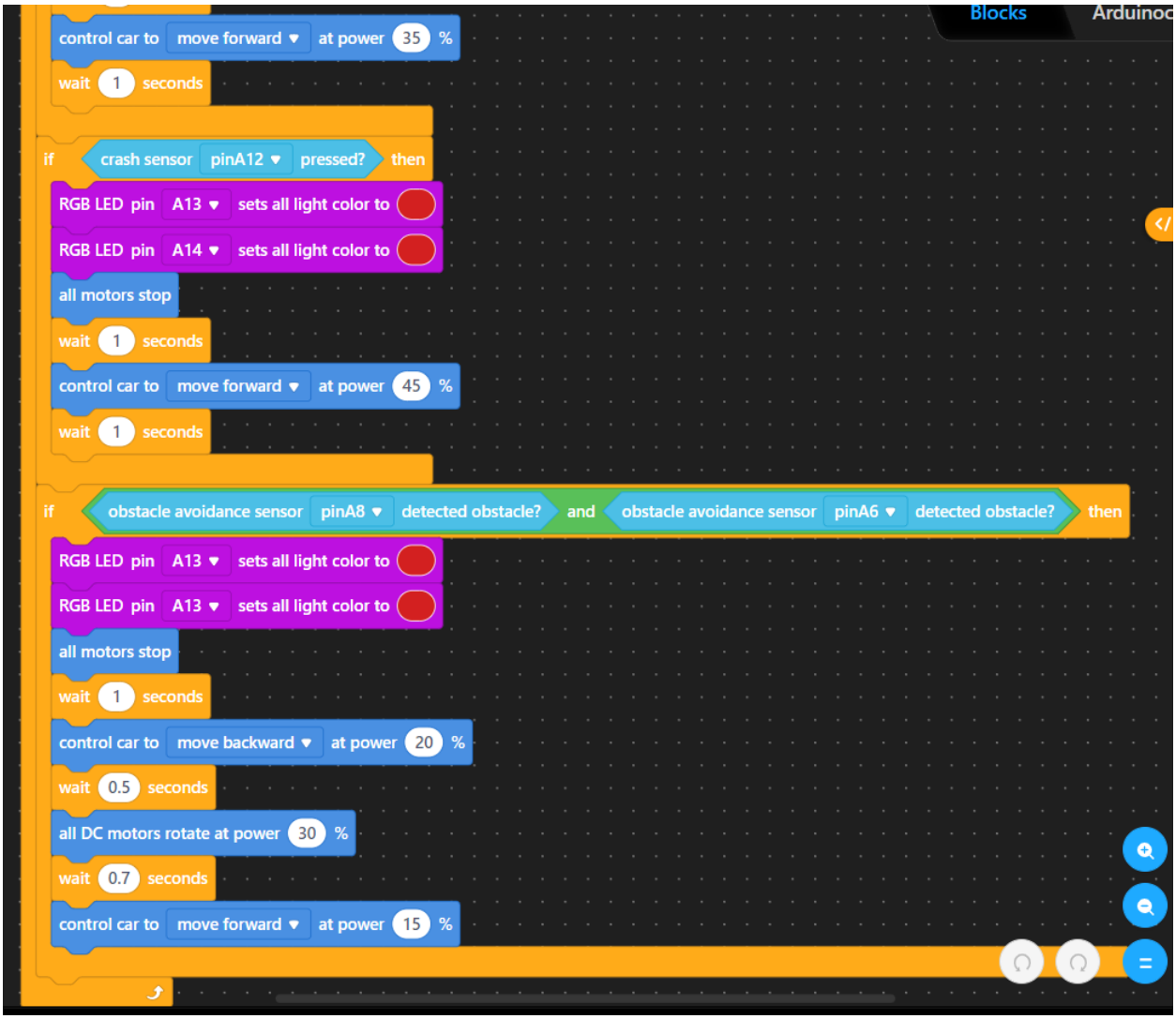

Looks
Motion
Sensing
Events
Control
Operators
Variables
My Blocks
+
-
*
/
pick random 1 to 10
> 50
< 50
= 50
and
or
not
join banana apple
letter 1 of apple


Looks
Motion
Sensing
Events
obstacle avoidance sensor pinA6 detected obstacle?
line-following sensor pinA9 detected
crash sensor pinA11 pressed?
timer
reset timer


if
obstacle avoidance sensor pinA8 detected obstacle?
and
obstacle avoidance sensor pinA6 detected obstacle?
then
RGB LED pin A13 sets all light color to


when mBot Mega (MegaPi) starts up
wait 1 seconds
forever
control car to move forward at power 50 %
RGB LED pin A14 sets all light color to
RGB LED pin A13 sets all light color to
if not obstacle avoidance sensor pinA6 detected obstacle? then
control car to move forward at power 50 %
if obstacle avoidance sensor pinA6 detected obstacle? then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to
all motors stop
wait 1 seconds
control car to move backward at power 20 %
wait 0.5 seconds
all DC motors rotate at power -35 %
wait 0.7 seconds
control car to move forward at power 15 %
if not obstacle avoidance sensor pinA8 detected obstacle? then


if not obstacle avoidance sensor pinA8 detected obstacle? then
control car to move forward at power 50 %
if obstacle avoidance sensor pinA8 detected obstacle? then
RGB LED pin A13 sets all light color to
RGB LED pin A13 sets all light color to
all motors stop
wait 1 seconds
control car to move backward at power 20 %
wait 0.5 seconds
all DC motors rotate at power 35 %
wait 0.7 seconds
control car to move forward at power 15 %
if crash sensor pinA11 pressed? then
RGB LED pin A13 sets all light color to
RGB LED pin A14 sets all light color to
all motors stop
wait 1 seconds
control car to move forward at power 35 %
wait 1 seconds



(All of this code can be found in our cheat sheet)

4. Between each part, the students will test run the bot using obstacles around them, or the created obstacle course