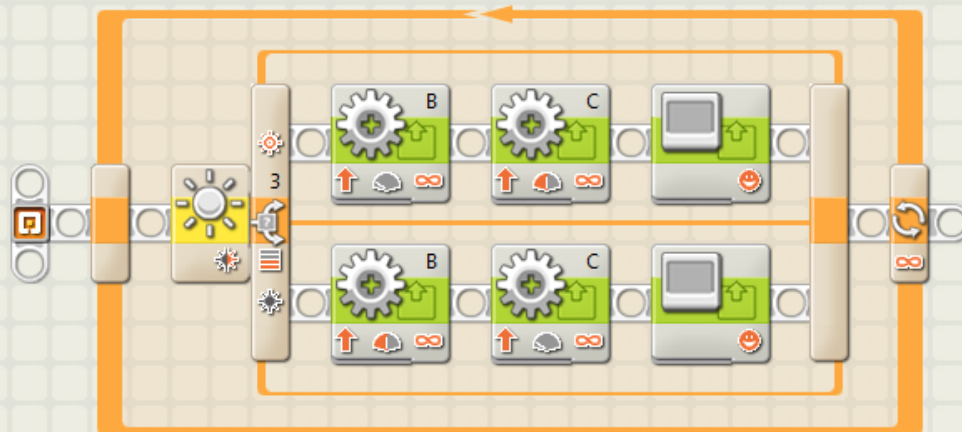


Line Following Robot “Simple”

Decision Choices: 2



A Forever loop is used to repeatedly get sensor readings and apply the appropriate steering correction to the wheels, as fast as possible. The loop will repeat several times per second.



After the Motor blocks, a Display block is used to show an image that indicates whether the light sensor is currently seeing light or dark.

Inside the loop, we repeatedly check the light sensor and then switch on the midpoint of the calibrated light range (50), and if we see brighter than 50 (white) then turn left, else darker than 50 (black) then turn right. The turns are done by making one wheel go at low power and the other go at higher power, using individual Motor blocks for each motor. This is more consistent and faster than using a single 2-motor Move block with steering because the rotation sensors don't interfere with the amount of steering.

The movement is "reverse" because the motors are mounted "backwards" on the robot, and the duration is Unlimited because we just want to start moving that way then immediately loop back and check the sensor again to see if we need to change direction (Unlimited here means "Go this way until I tell you otherwise").

Line Follow 2

Approach:

(1) Use an Infinite Loop to create an autonomous Robot. If you run this program, it will continue until you stop it or when the batteries die...

(2) Use a Switch Statement to allow the Robot to "Sense" its surroundings and make Decisions. We will be using the "Light" Sensor.

(3) Notice two subroutines, the top routine is if the sensor sees "White" or lighter colors. The bottom routine is for "Black" or darker colors.

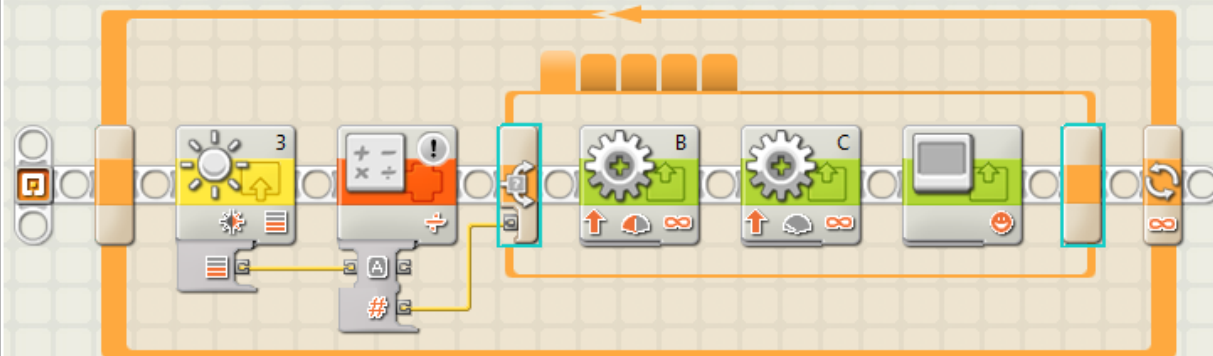
(4) Each routine has its own motor commands... Specifically the motors are meant to run forever... The infinite loop checks conditions very fast, possibly 100 times per second!

This is how the Robot Zig Zags while tracking the line!

Line Following Robot “Smooth”

Decision Choices: 5

A Forever loop is used to repeatedly get sensor readings and apply the appropriate steering correction to the wheels, as fast as possible. The loop will repeat several times per second.



In each condition of the Switch, after the Motor blocks is a Display block that displays an image that indicates how much black the robot is seeing.

Inside the loop, we repeatedly check the light sensor, which will return a calibrated number from 0 to 100 that corresponds to how much white the light sensor is seeing. 100 would mean totally over white, 0 is totally over black, 50 would mean that we are exactly centered on the border between the black and the white, and other values are between these cases. The goal is to go as straight as possible, so if we are mostly centered on the border then just go straight. If we are way off to the side, then make a hard turn in the correct direction. If we are slightly off center, then make a small steering correction in the correct direction.

To do this, we split the light range into five ranges, which we can respond to separately, by dividing the light sensor reading by 20, which takes the 0-100 number to 0-4 (or sometimes 5) and then using a Switch with five conditions for the numbers 0-4, (and 4 is the "default" condition so that it will catch the 5 values too). In these conditions we do:

- 0 = Hard Right turn by greatly reducing power to motor C
- 1 = Gradual Right turn by slightly reducing power to motor C
- 2 = Straight Ahead with both motors equal
- 3 = Gradual Left turn by slightly reducing power to motor B
- 4 = Hard Left turn by greatly reducing power to motor B

Individual Motor blocks are used to control each wheel instead of using a Move block with steering, since this keeps the rotation sensors from interfering with the amount of steering.

Note that the movement is "reverse" because the motors are mounted "backwards" on the robot, and the duration is Unlimited because we just want to start moving that way then immediately loop back and check the sensor again to see if we need to change direction (Unlimited here means "Go this way until I tell you otherwise").

Control: Value

Type: Number

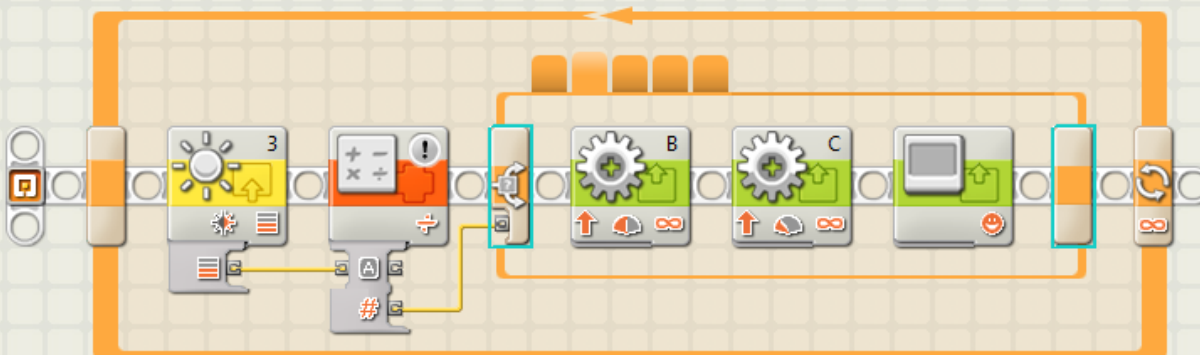
Display: Flat view

Conditions:

1.	0	
2.	1	
3.	2	
4.	3	
✓ 5.	4	

0

A Forever loop is used to repeatedly get sensor readings and apply the appropriate steering correction to the wheels, as fast as possible. The loop will repeat several times per second.



In each condition of the Switch, after the Motor blocks is a Display block that displays an image that indicates how much black the robot is seeing.

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Control: Value

Type: Number

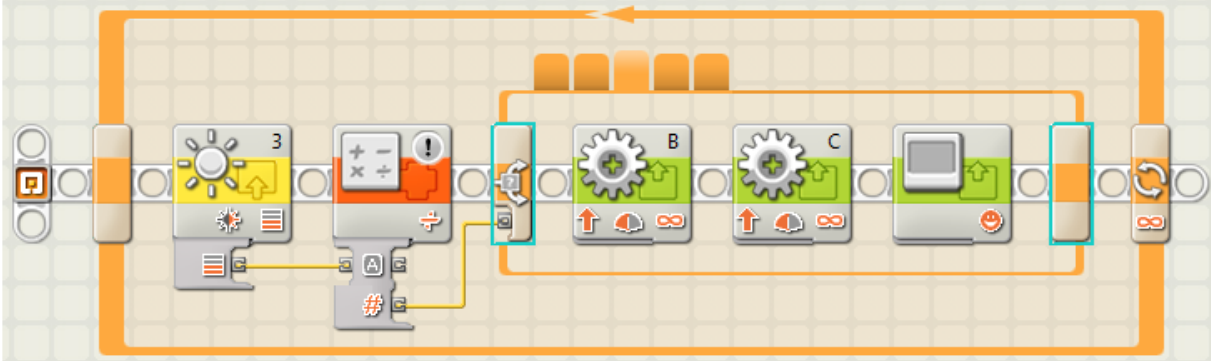
Display: Flat view

Conditions:

1.	0
2.	1
3.	2
4.	3
5.	4

1

A Forever loop is used to repeatedly get sensor readings and apply the appropriate steering correction to the wheels, as fast as possible. The loop will repeat several times per second.



In each condition of the Switch, after the Motor blocks is a Display block that displays an image that indicates how much black the robot is seeing.

Inside the loop, we repeatedly check the light sensor, which will return a calibrated number from 0 to 100 that corresponds to how much white the light sensor is seeing. 100 would mean totally over white, 0 is totally over black, 50 would mean that we are exactly centered on the border between the black and the white, and other values are between these cases. The goal is to go as straight as possible, so if we are mostly centered on the border then just go straight. If we are way off to the side, then make a hard turn in the correct direction. If we are slightly off center, then make a small steering correction in the correct direction.

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Individual Motor blocks are used to control each wheel instead of using a Move block with steering, since this keeps the rotation sensors from interfering with the amount of steering.

Note that the movement is "reverse" because the motors are mounted "backwards" on the robot, and the duration is Unlimited because we just want to start moving that way then immediately loop back and check the sensor again to see if we need to change direction (Unlimited here means "Go this way until I tell you otherwise").

Control: Value

Type: Number

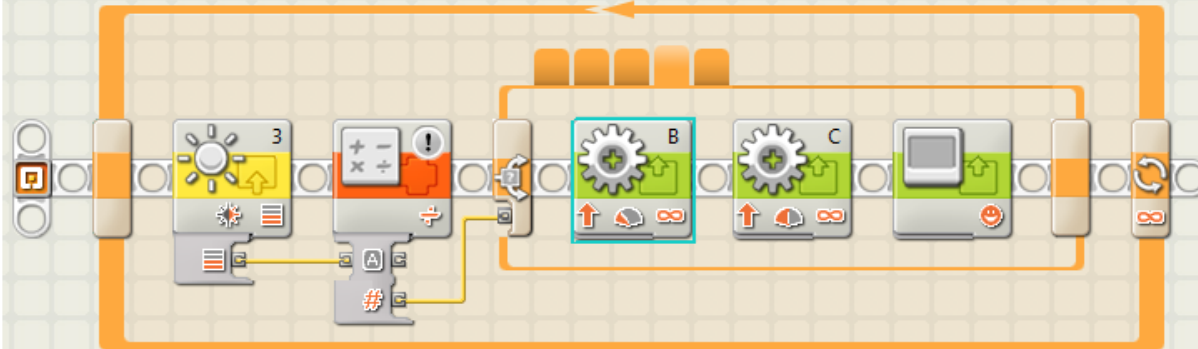
Display: Flat view

Conditions:

1.	0
2.	1
3.	2
4.	3
5.	4

2

A Forever loop is used to repeatedly get sensor readings and apply the appropriate steering correction to the wheels, as fast as possible. The loop will repeat several times per second.



In each condition of the Switch, after the Motor blocks is a Display block that displays an image that indicates how much black the robot is seeing.

Inside the loop, we repeatedly check the light sensor, which will return a calibrated number from 0 to 100 that corresponds to how much white the light sensor is seeing. 100 would mean totally over white, 0 is totally over black, 50 would mean that we are exactly centered on the border between the black and the white, and other values are between these cases. The goal is to go as straight as possible, so if we are mostly centered on the border then just go straight. If we are way off to the side, then make a hard turn in the correct direction. If we are slightly off center, then make a small steering correction in the correct direction.

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Port: A B C

Control: Motor Power

Direction: ↑ ↓ ↻

Duration: 360 Unlimited

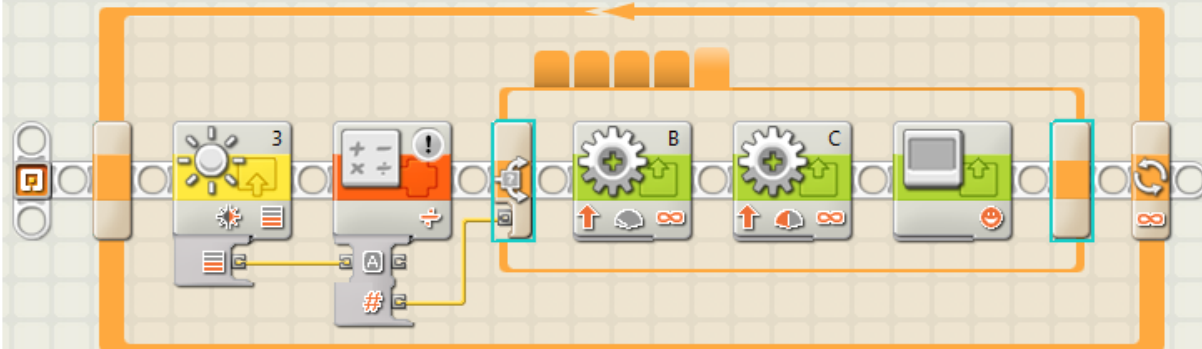
Action: Constant

Wait: Wait for Completion

Power: 40

Next Action: Brake Coast

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Control: Value

Type: Number

Display: Flat view

Conditions:

1.	0
2.	1
3.	2
4.	3
5.	4

4

More Detailed Instructions

- Inside the loop, we repeatedly check the light sensor, which will return a calibrated number from 0 to 100 that corresponds to
- how much white the light sensor is seeing. 100 would mean totally over white, 0 is totally over black, 50 would mean that
- we are exactly centered on the border between the black and the white, and other values are between these cases.
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- the side, then make a hard turn in the correct direction. If we are slightly off center, then make a small steering correction
- in the correct direction.

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- sensors from interfering with the amount of steering.

- Note that the movement is "reverse" because the motors are mounted "backwards" on the robot, and the duration is Unlimited
- because we just want to start moving that way then immediately loop back and check the sensor again to see if we need to change
- direction (Unlimited here means "Go this way until I tell you otherwise").