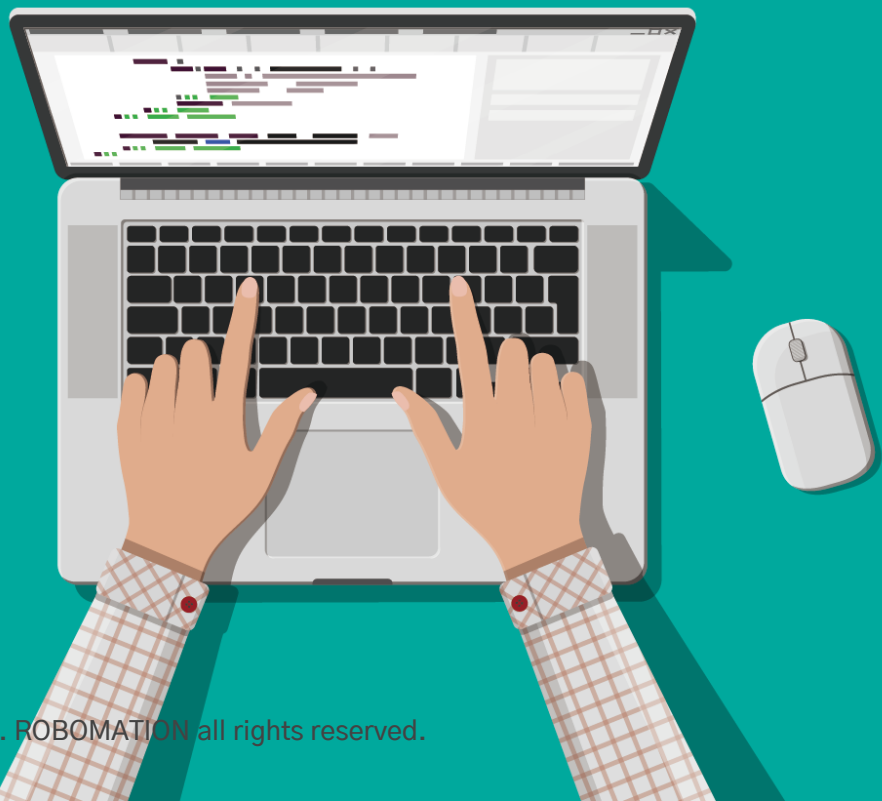
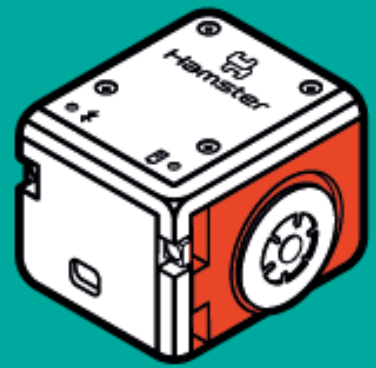
e-book

Hamster Coding

Scratch 13

Written by ConceptOn





ROBOMATION
MAKE THINGS ALIVE

How to Use

This manual is designed for the educational utilization of the Hamster robot.

- Please use this manual as on-screen instructions when teaching the Hamster class.
- The contents are easy to understand. Just read them before the class.
- Worksheets can be downloaded from the Robomation website.
- This manual can be used to ensure the best lesson plan.
- For more information, contact us at 7concepton@daum.net.

Hamster Coding Scratch 13

Let’s get started with Hamster coding with the Scratch program!

The use of the Scratch programs will make coding more interesting!

ROBOMATION
MAKE THINGS ALIVE

Today's Activity

Division	Description	Time
Introduction	**Explore the problem.** Why not code for your Hamster to follow the black line to move?	5min
Development	**Find a solution.** Let's code by controlling the floor sensor and the Illuminance Sensor. **Solve the problem.** Let's command your Hamster to move according to a given mission.	30min
Conclusion	**Review today's activities.** Let's talk about what you have learned and enjoyed.	5min

Shall we try coding for your Hamster to follow the black line?

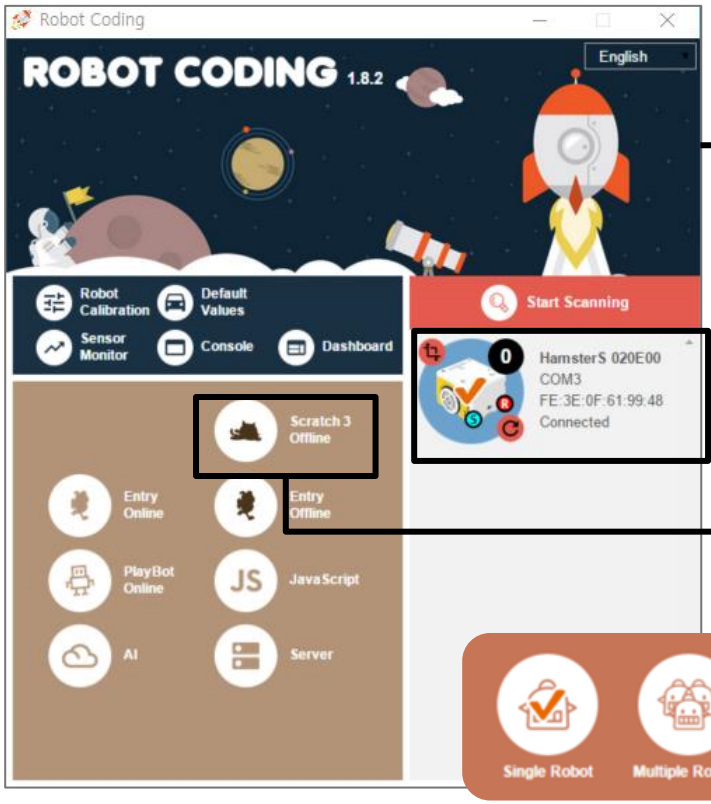
Get ready

First, let’s find out what is needed for Hamster coding.

1. Hamster
2. Bluetooth Dongle
3. PC
4. Worksheet
5. Writing supplies (pen and paper)
6. Charging cable

Open the program

When opening the program, turn on Hamster and plug the Bluetooth Dongle into the USB port of your PC.



Open the program

1. Run the Robot Coding program.

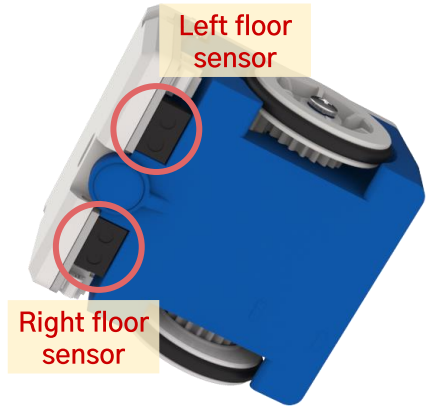
2. Check if your Hamster robot is connected with the Bluetooth Dongle (through its LED light colors).

3. Click on Scratch 3 Offline.

4. Click on “Single Robot” and then “New File.”

Let's think

What sensor is used for Hamster to detect and follow the black line drawn on the floor?



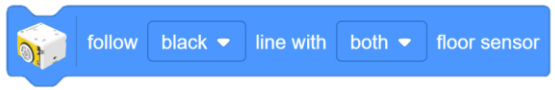
There are two floor sensors placed at the bottom of Hamster!

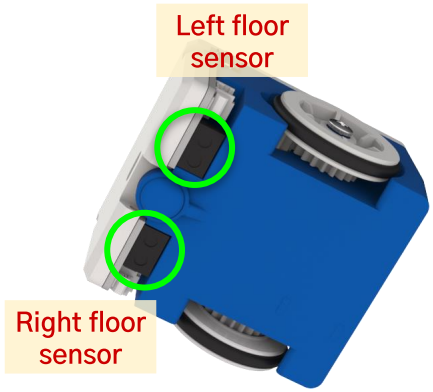
Floor sensor

Guess how?

Let’s write the code for your Hamster to follow the black line.

Code hints





Does it follow the black line?

This code is designed for Hamster to follow the black line drawn on the white floor.

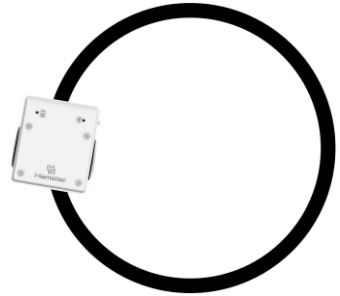
Exercise 1

Let's write the code so that your Hamster can follow the black line.

Preparations: Hamster, Worksheet

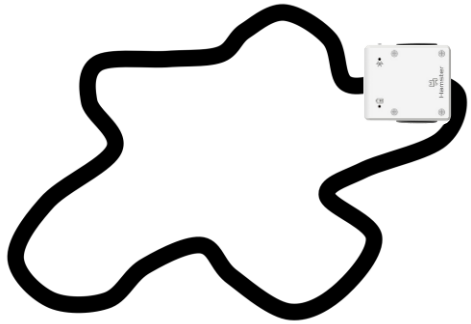
1. Follow a straight line

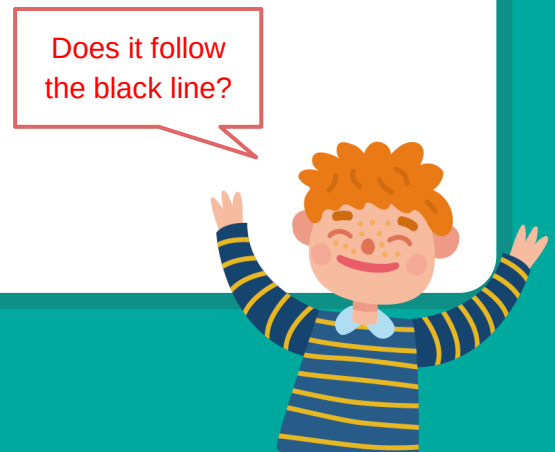
2. Follow a circle



3. Follow a rectangle.

4. Follow a freely drawn line

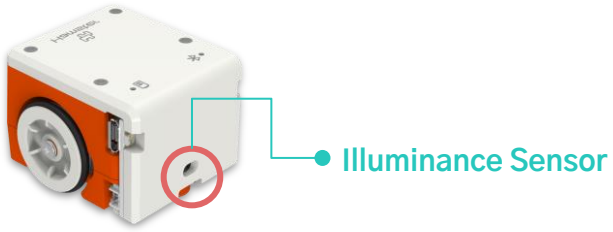


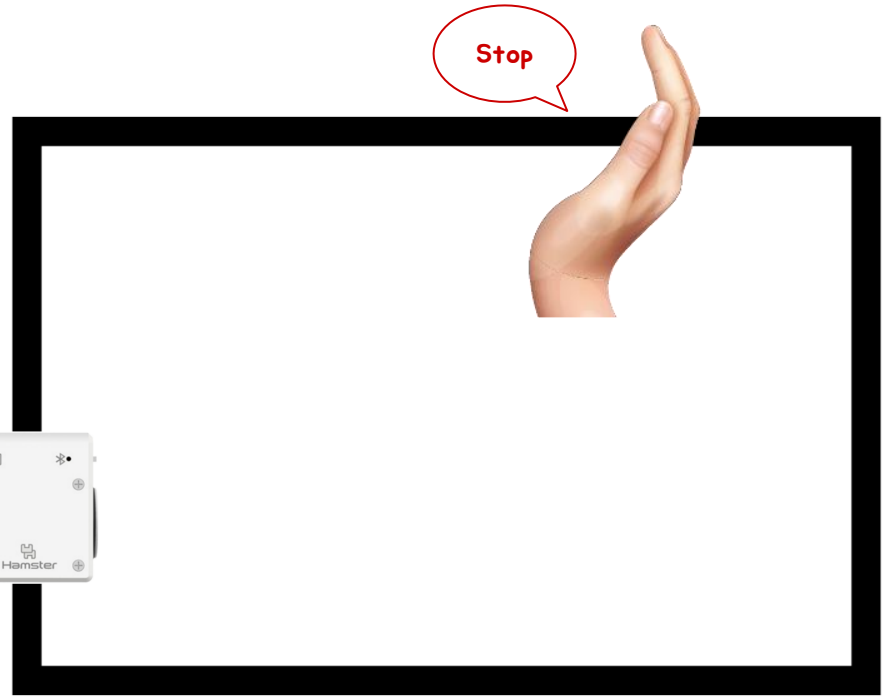


Write code for the left, right, and both sensors before operating them.

Guess how?

Let’s think about the code that allows your Hamster to stop when it detects your hand while following the black line.

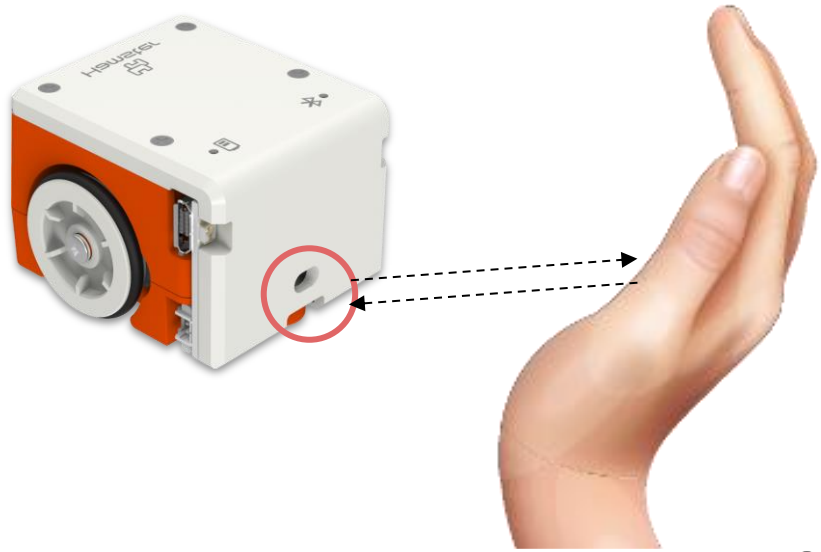


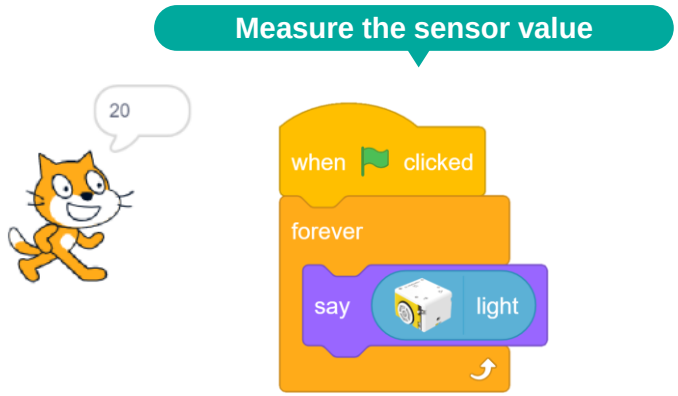


Use the Illuminance Sensor
to stop Hamster
when it detects your hand.

Measure the Illuminance Sensor values

Let's talk about how the sensor values change after measurement.





The Say code can be used to measure the Illuminance Sensor values.

1. Measure the Illuminance Sensor values, which depend on the distance between Hamster and your hand.

Division	2cm	5cm	10cm	15cm
Illuminance sensor				

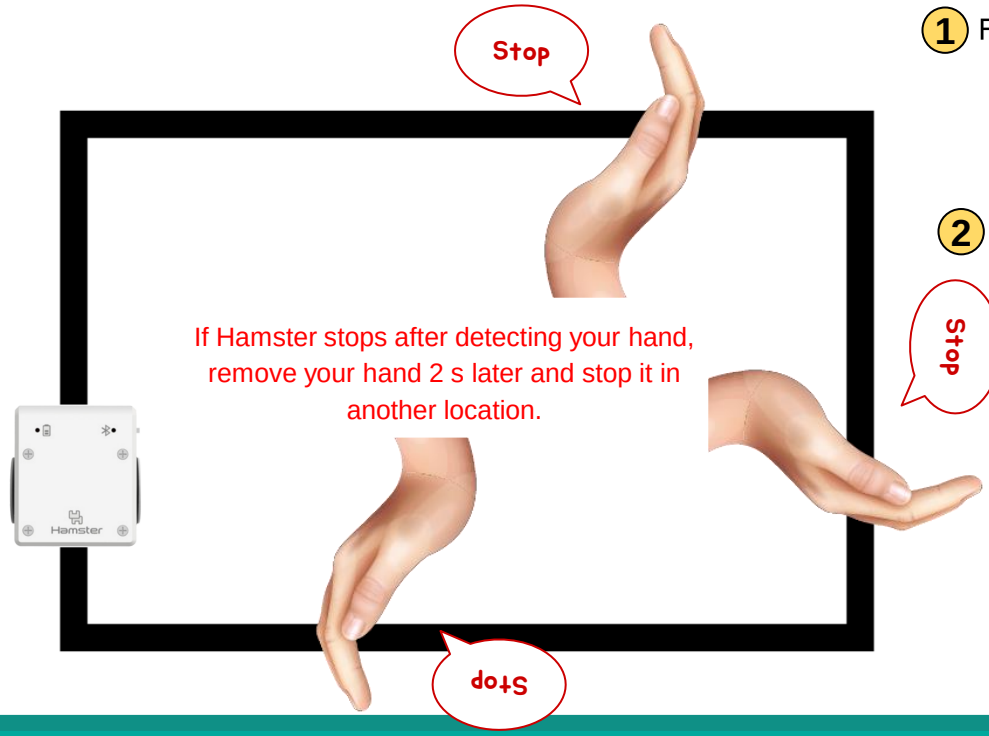
2. How do the Illuminance Sensor values change as your hand comes closer to the sensor?

The values become smaller.

Exercise 2

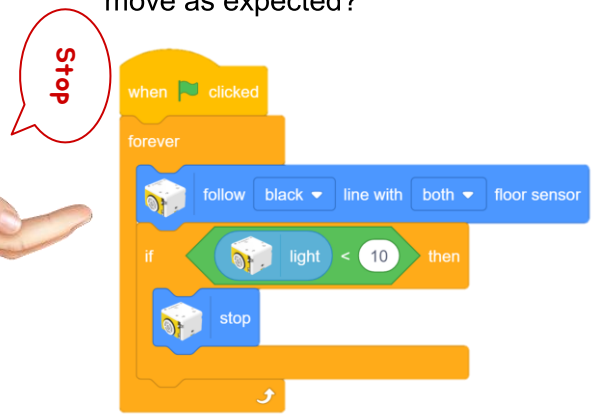
Let's think about the code that allows your Hamster to stop when it detects your hand while following the black line.

Preparations: Hamster, Worksheet



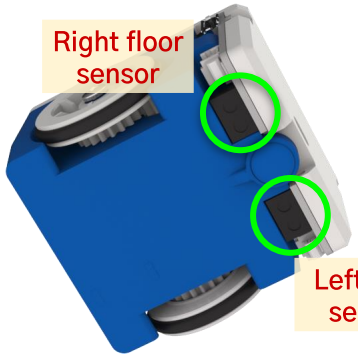
1 Find the code that checks the sensor values.

2 Write and execute the code. Did your Hamster move as expected?



Guess how?

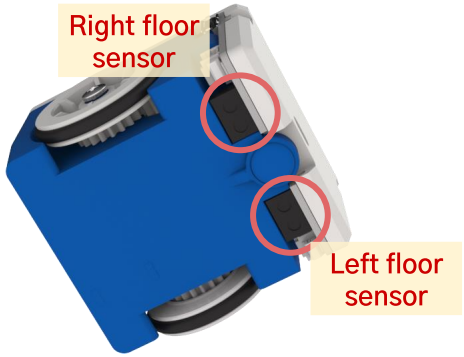
Let’s think about the code that allows your Hamster to stop after crossing four black lines.

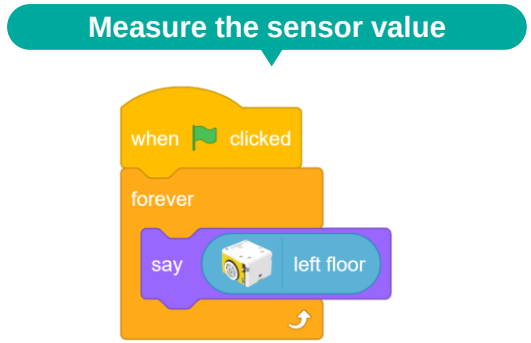


Use the floor sensors for your Hamster to cross four black lines.

Measure the floor Sensor values

Let's talk about how the sensor values change after measurement.





The Say code can be used to measure the floor sensor values.

① Let's measure the sensor values when the floor sensor detects the black line and when it doesn't, respectively.

Division	On black color	On white color
Left floor sensor		
Right floor sensor		

② How different are the sensor values measured when the floor sensor detects black and white each?

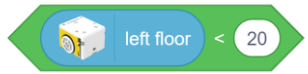
The sensor value is greater when it detects white than when it detects black.

Exercise 3

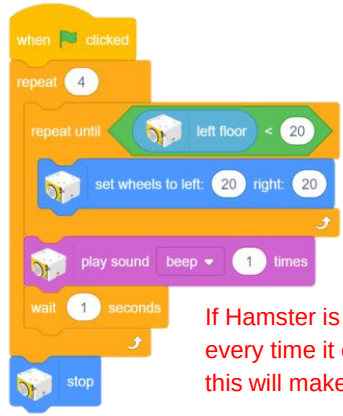
Let’s think about the code that allows your Hamster to stop after crossing four black lines.

Preparations: Hamster, Worksheet

1. Find the code that checks the sensor values.



2. Write and execute the code. Did your Hamster move as expected?

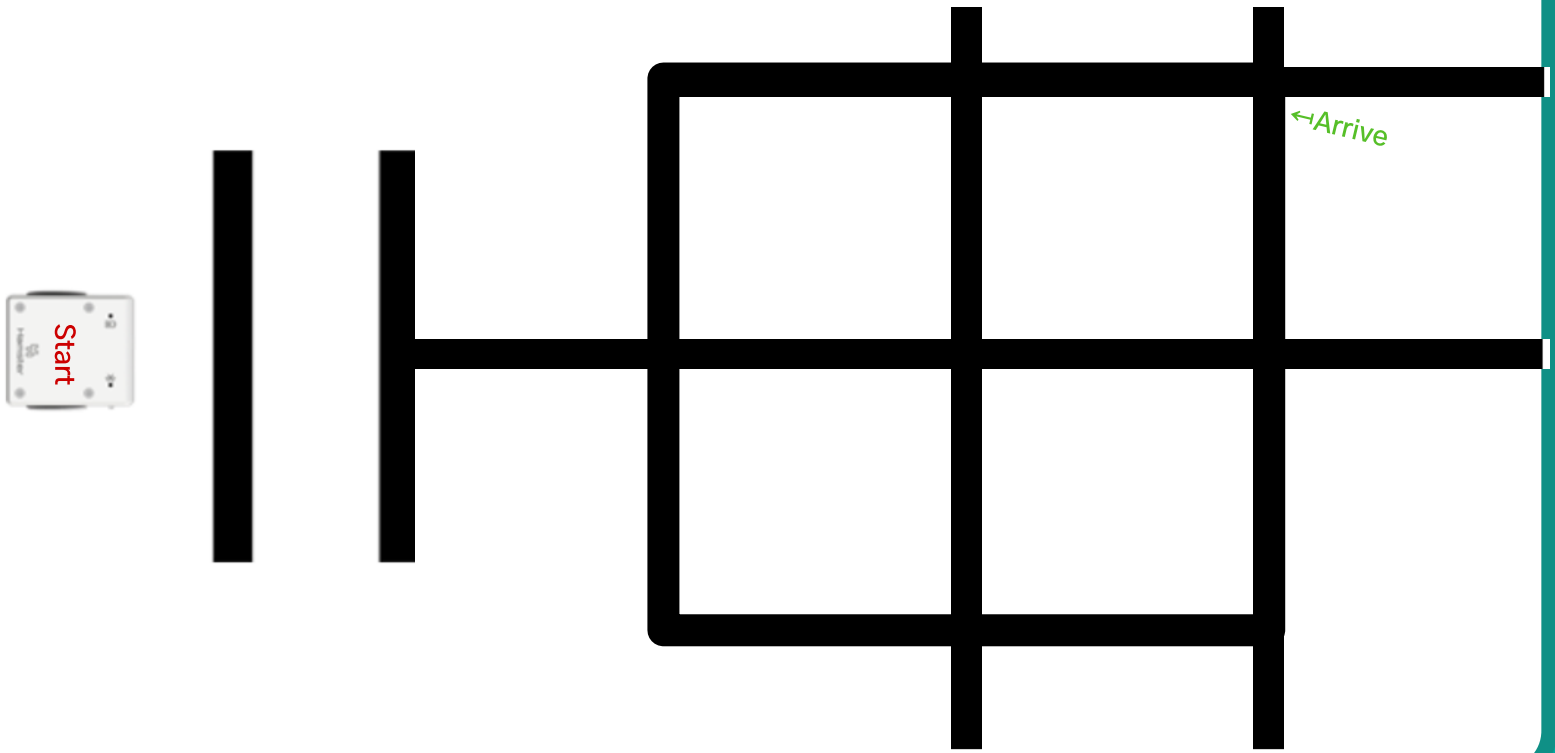


If Hamster is allowed to make a beep every time it crosses each black line, this will make it easy to identify each crossing.

Hamster line tracer

Challenge

Let’s write the code for your Hamster to follow the black line according to a given mission.



Let's Review

- What did you learn today?
- Did you encounter any difficulties?
- What interested you the most about Hamster robot?