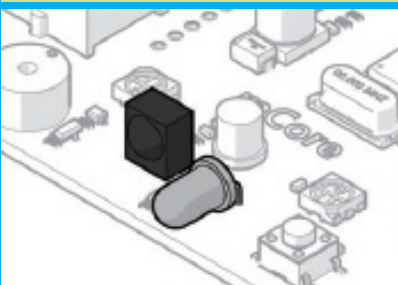


module 3 - InfraRed Transceiver

LEARNING OBJECTIVES:

- Use of mathematic operation
- Use variables
- Use of infrared remote control
- Use of Infrared Transceiver Module



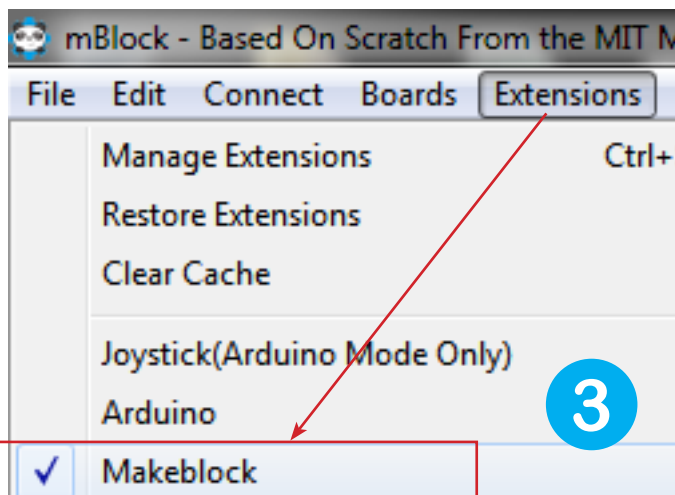
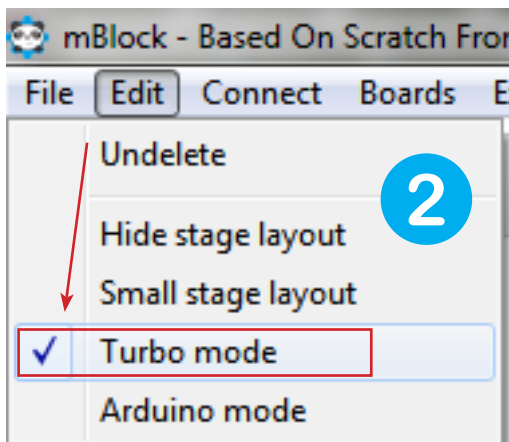
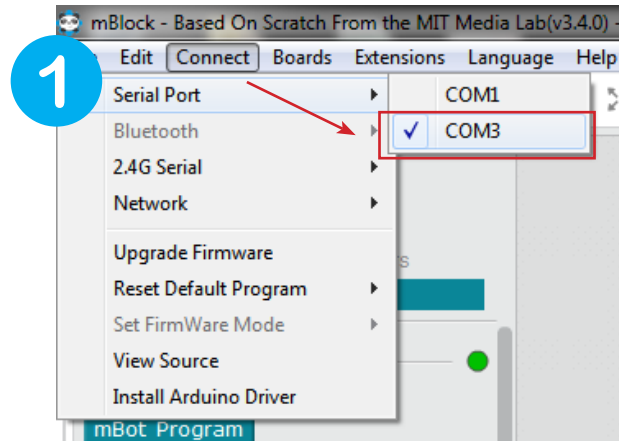
Infrared remote control

Lets you send information via infrared to the infrared receiver module. Then process the received data in the program.

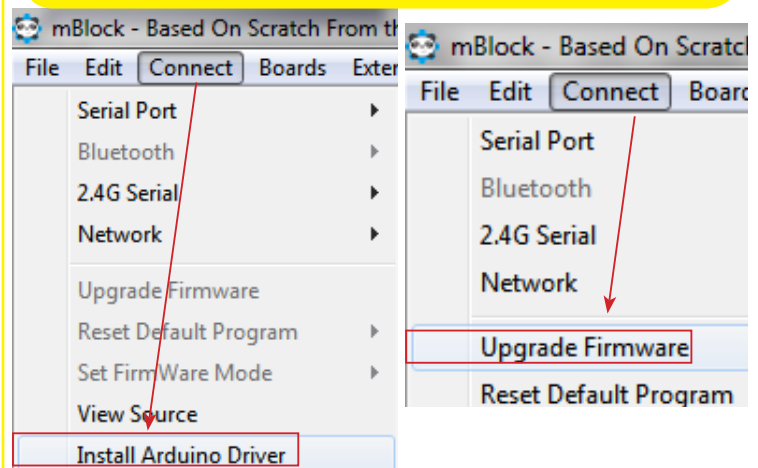
Infrared Transceiver Module

The mBot infrared transceiver module is able to receive and send information. The transmitted information can be numbers and text.

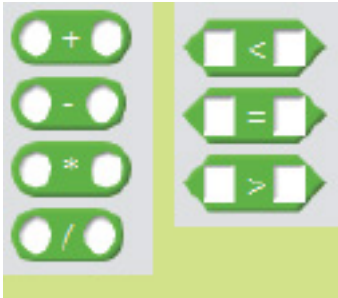
BEFORE WE START: Make sure you have mBlock software installed and correct options selected



If you can't find the correct port please try to install Arduino driver. Then try to select the new port and next Upgrade the Firmware:

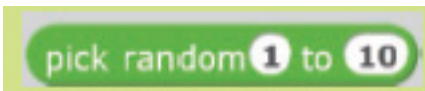


BUILDING BLOCKS

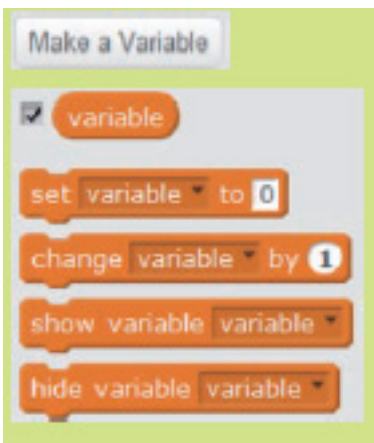


Operators

Four operations include addition, subtraction, multiplication, division. You can fill in the values or variables. Comparison operators can be used to compare the value with the variable, the variable with the variable, the value with the value. The input of the sensor can also be used as a variable



Random number blocks. You can fill in the values or variables.

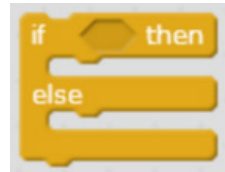


Variable is a container for storing data. Its value can be freely modified according to the needs.



If <condition> then

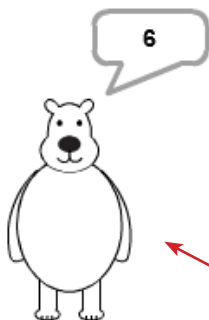
If the condition is satisfied, the internal script is executed



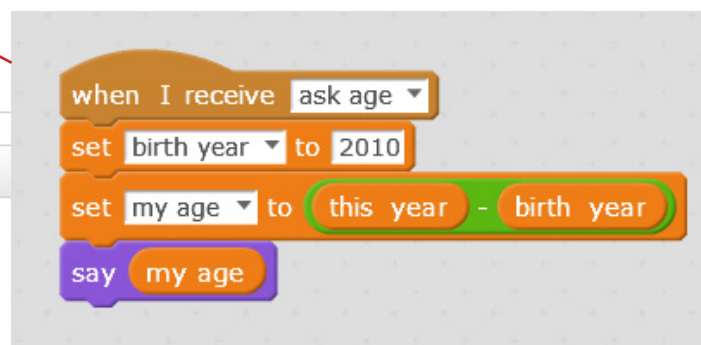
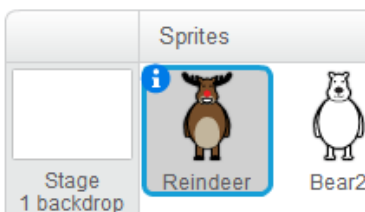
If <condition> then else

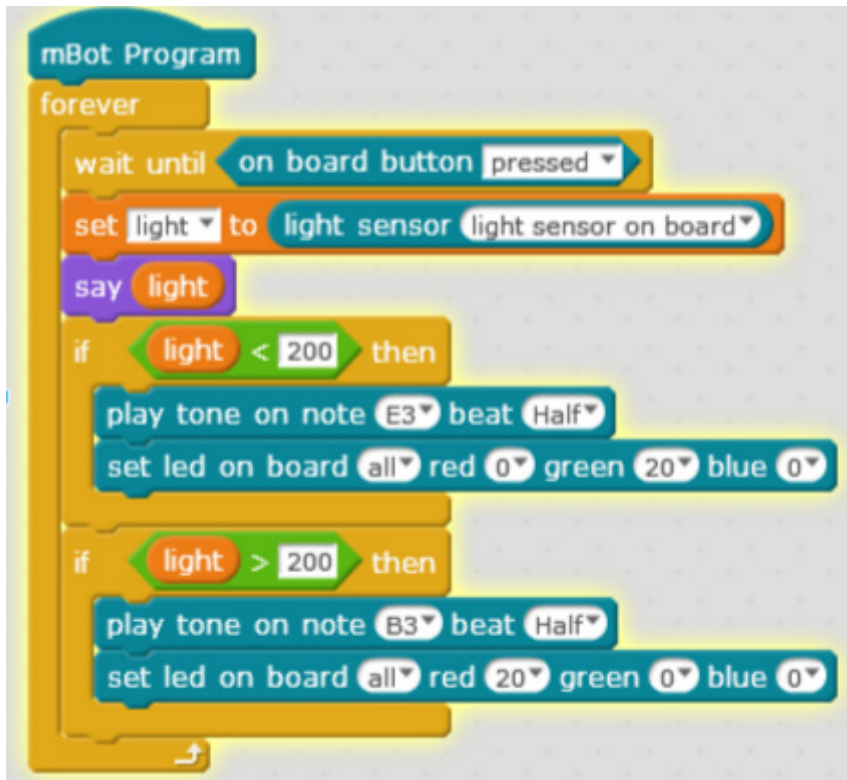
The “if .. then otherwise block” is a double branch structure. The upper part will run if the conditions are met. If not, the lower part will run.

TRY IT



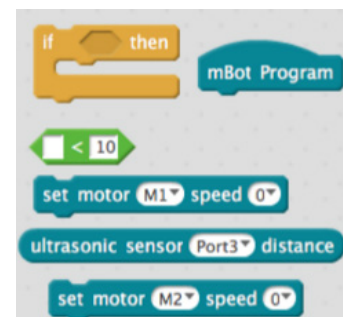
How old are you?





Exercises

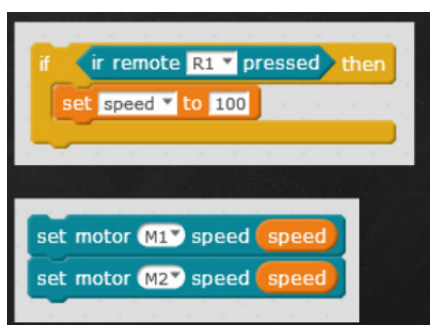
1. Use the blocks on the right to move the robot forward and stop when within 10 cm of an obstacle



2a. Use the blocks below to assign following behaviour to Infrared Transceiver Module:

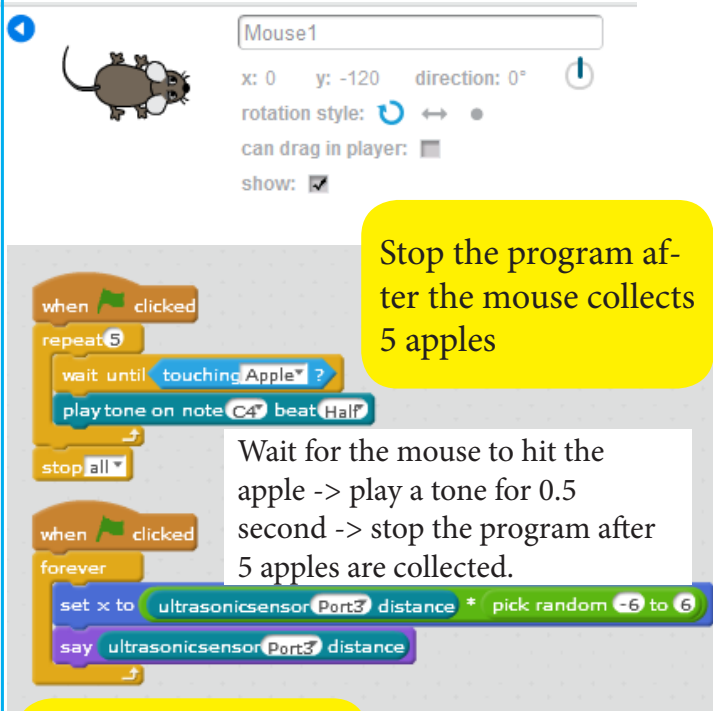
- on B stop
- on ▲ move forward
- on ▼ move backwards
- on ◀ move left
- on ▶ move right

2b. Challenge: change speed by setting a variable



Version 2: Control mouse via ultrasonic sensor

MOUSE SPRITE



Mouse1

x: 0 y: -120 direction: 0°

rotation style:

can drag in player: ☐

show: ☒

when green flag clicked

repeat 5

wait until touching Apple?

play tone on note C4 beat Half

stop all

when green flag clicked

forever

set x to ultrasonicsensor Port3 distance * pick random -6 to 6

say ultrasonicsensor Port3 distance

Stop the program after the mouse collects 5 apples

Wait for the mouse to hit the apple -> play a tone for 0.5 second -> stop the program after 5 apples are collected.

Use mCore together with the ultrasonic sensor to control the moving of the mouse.

You must use values that are through constantly repeating and updating the ultrasonic sensor to make the position of the mouse dynamically change.

APPLE SPRITE



Apple

x: 85 y: 60 direction: 90°

rotation style:

can drag in player: ☐

show: ☒

when green flag clicked

forever

show

go to x: pick random -200 to 200 y: 140

repeat until touching edge?

change y by -10

hide

Keep apples falling

Repeatedly execute its contained script -> Display Apple -> Specify the location that the apple appears -> Repeatedly move the apple down until it hit the edge -> After it hits the edge, hide the apple

Exercises

1. Try to use loop structure to control RGB light on the baseboard. Let them flash once every second and indicate which building blocks are the loop body.
2. Try to make the buzzer sound as C4 in 10 times, E5 in 20 times, B6 in 30 times, and then keep repeating. Can you distinguish these loop bodies inside it? Try it.
3. Write a program that will make the robot move forward until it gets within 5cm of an obstacle. Use following blocks:



set motor M1 speed 0

set motor M2 speed 0

set motor M1 speed 100

set motor M2 speed 100

repeat until

ultrasonicsensor Port3 distance

4. Modify the program above so that buzzer plays C4 when it gets within 6 - 5cm of an obstacle

