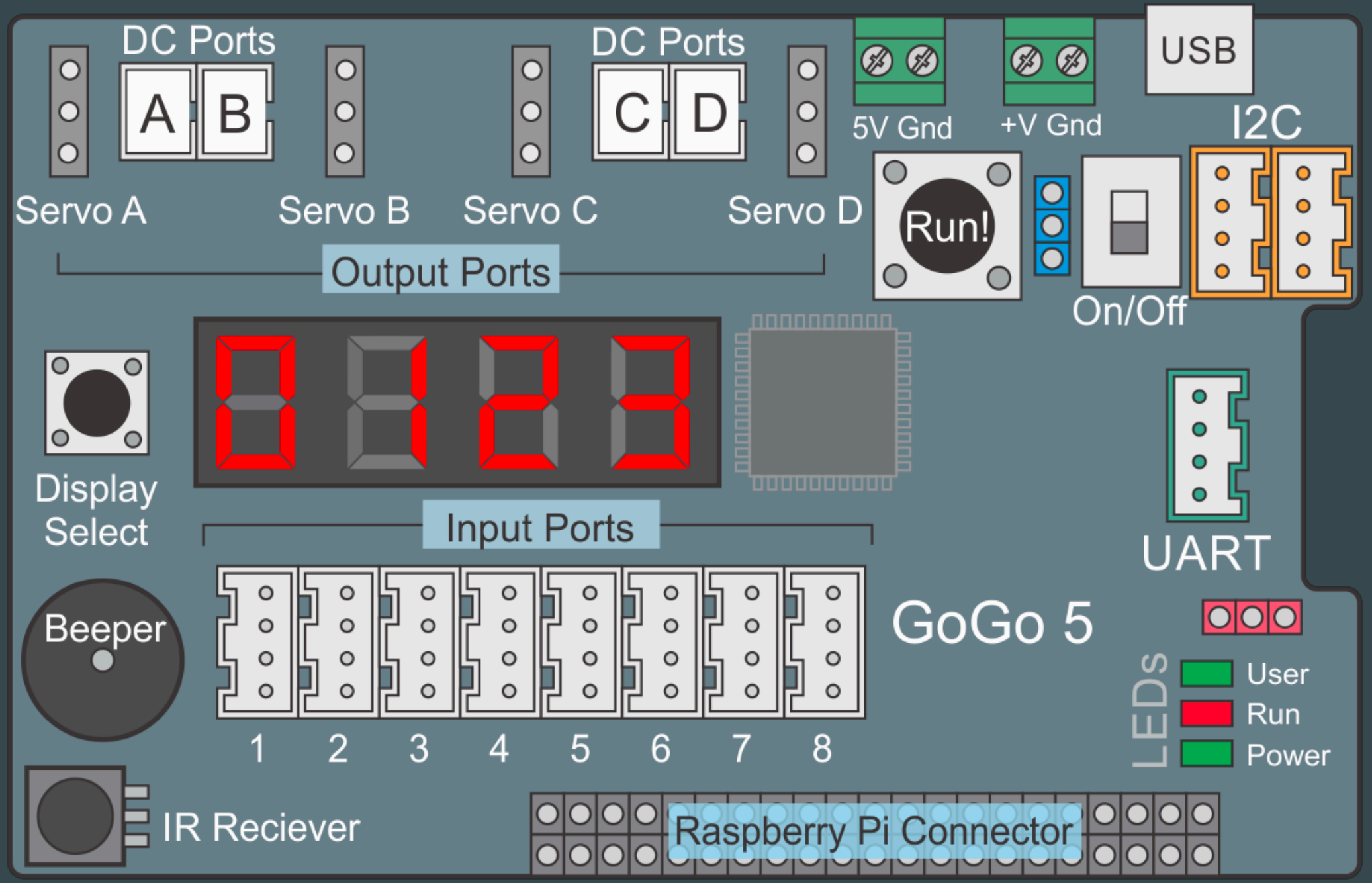
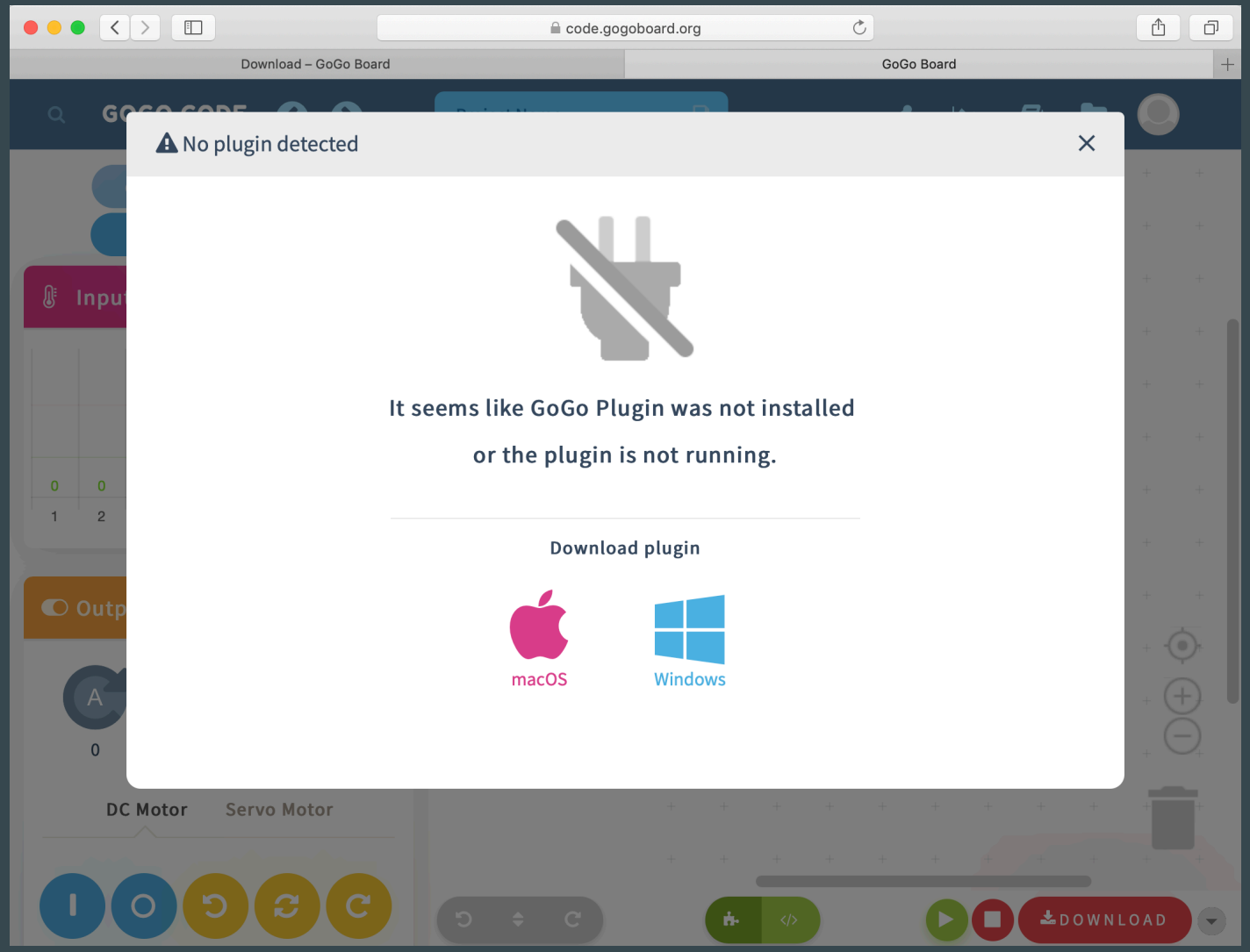
Engineering with the GoGo board

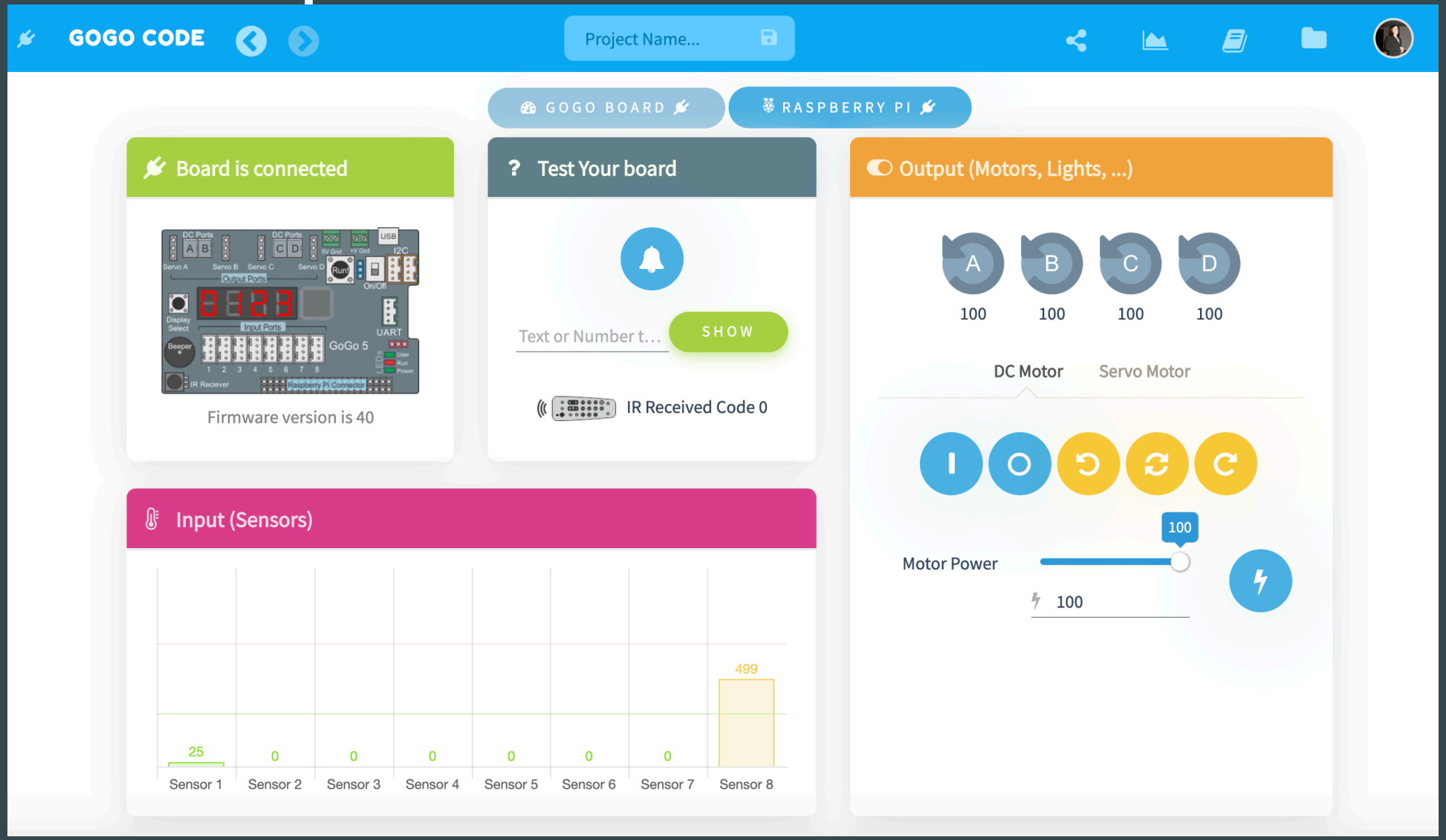
Claudia Urrea


DC Ports
A
B
DC Ports
C
D
USB
5V Gnd
+V Gnd
I2C
Servo A
Servo B
Servo C
Servo D
Run!
On/Off
Output Ports
Display
Select
Input Ports
UART
Beeper
GoGo 5
LEDs
User
Run
Power
1
2
3
4
5
6
7
8
IR Reciever
Raspberry Pi Connector

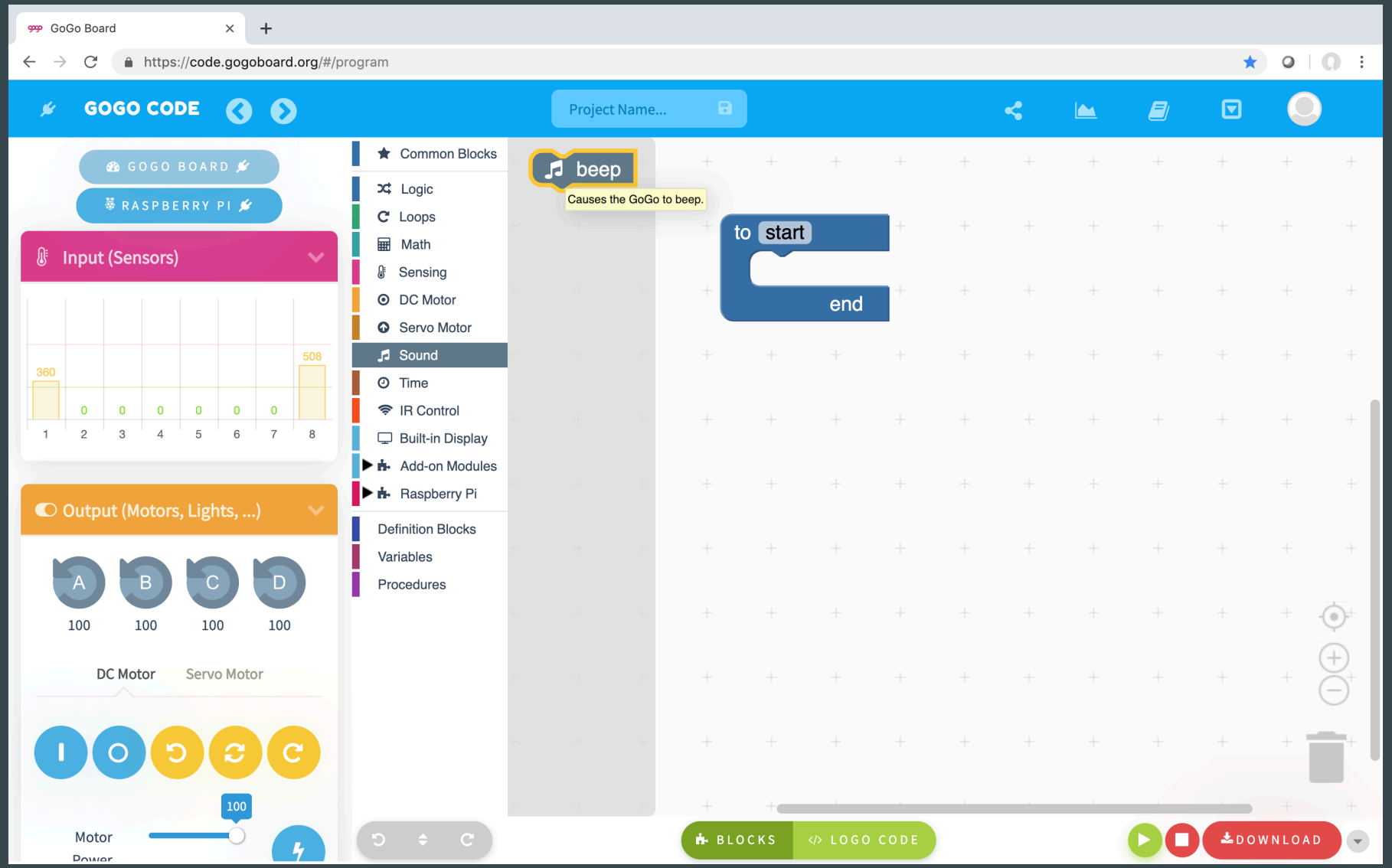
https://code.gogoboard.org/#/program



Control panels

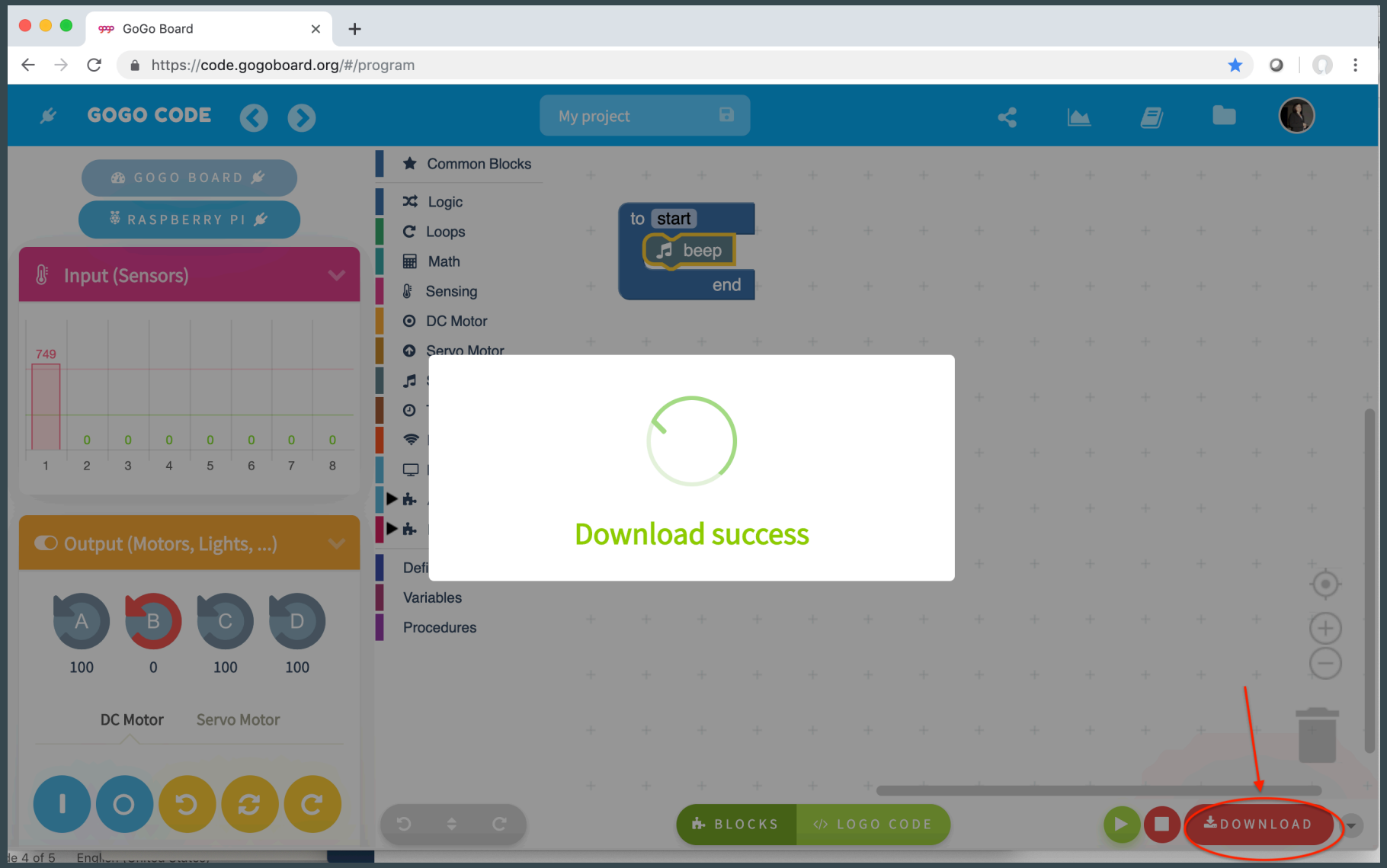


Simple procedure - Sound



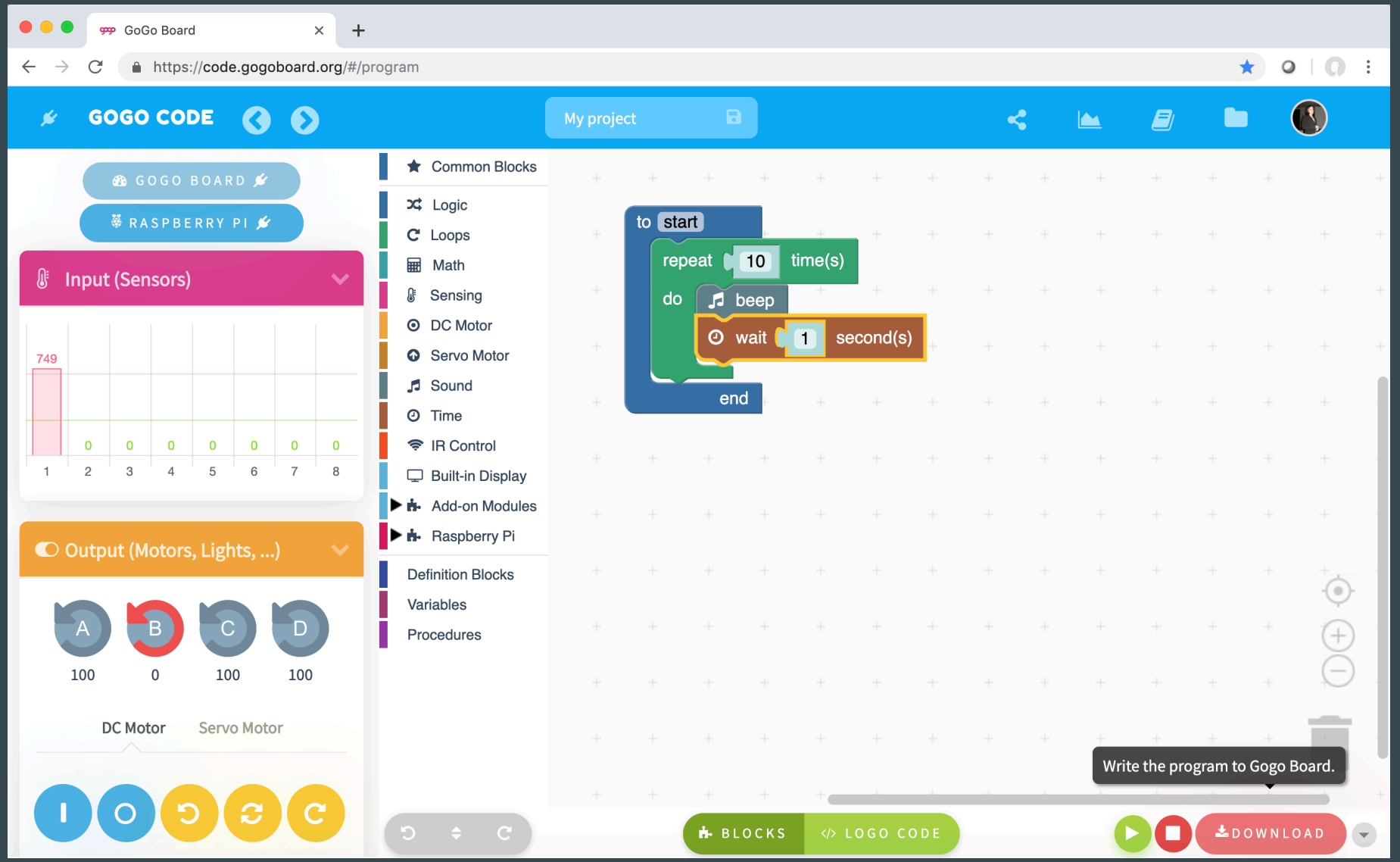
Insert a "Beep" block into the Procedure block!

Simple procedure - Sound



”Download” the program to the GoGo Board!

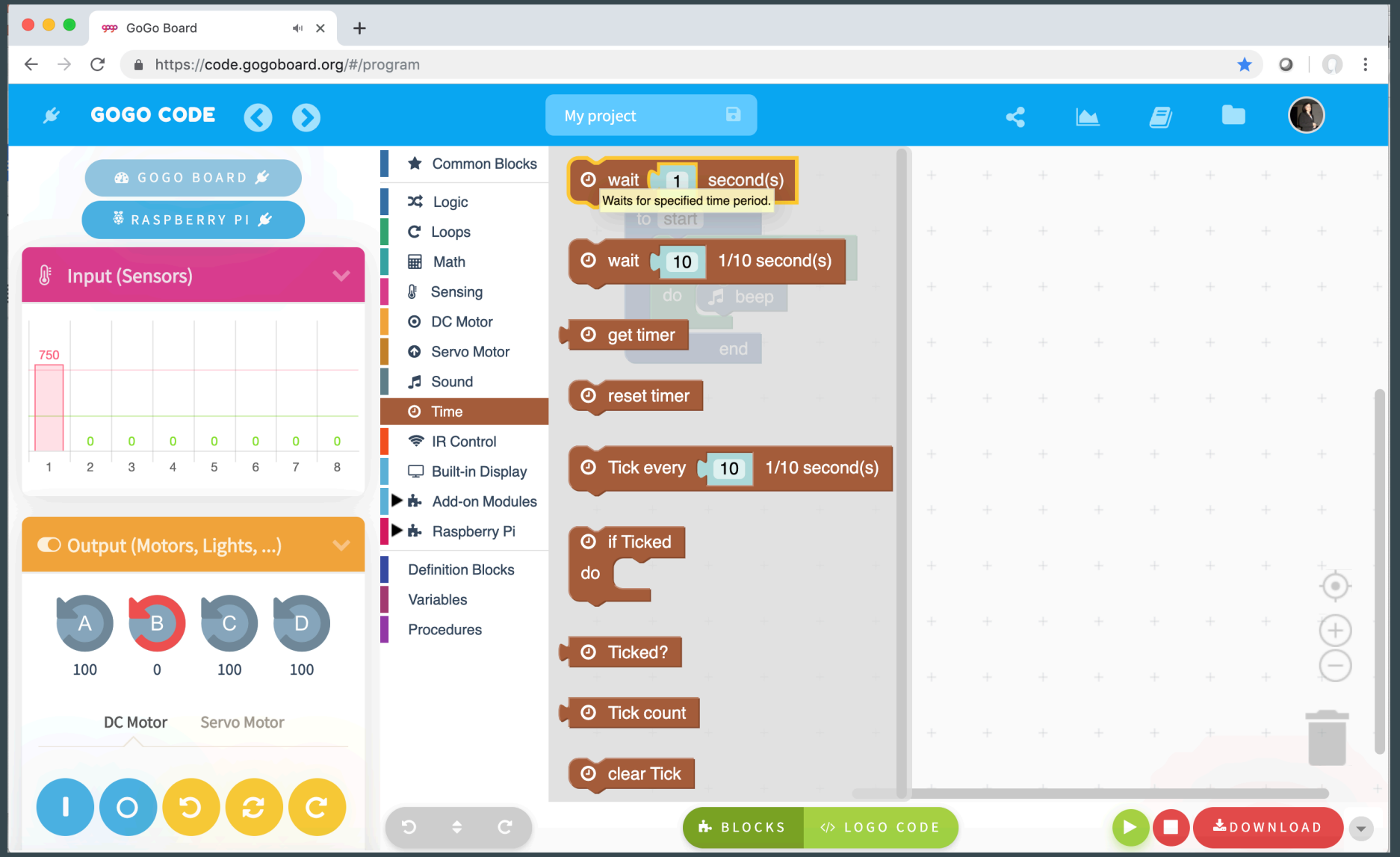
Simple procedure – Sound, insert a loop



Explore using a “Repeat” and a “Wait” blocks

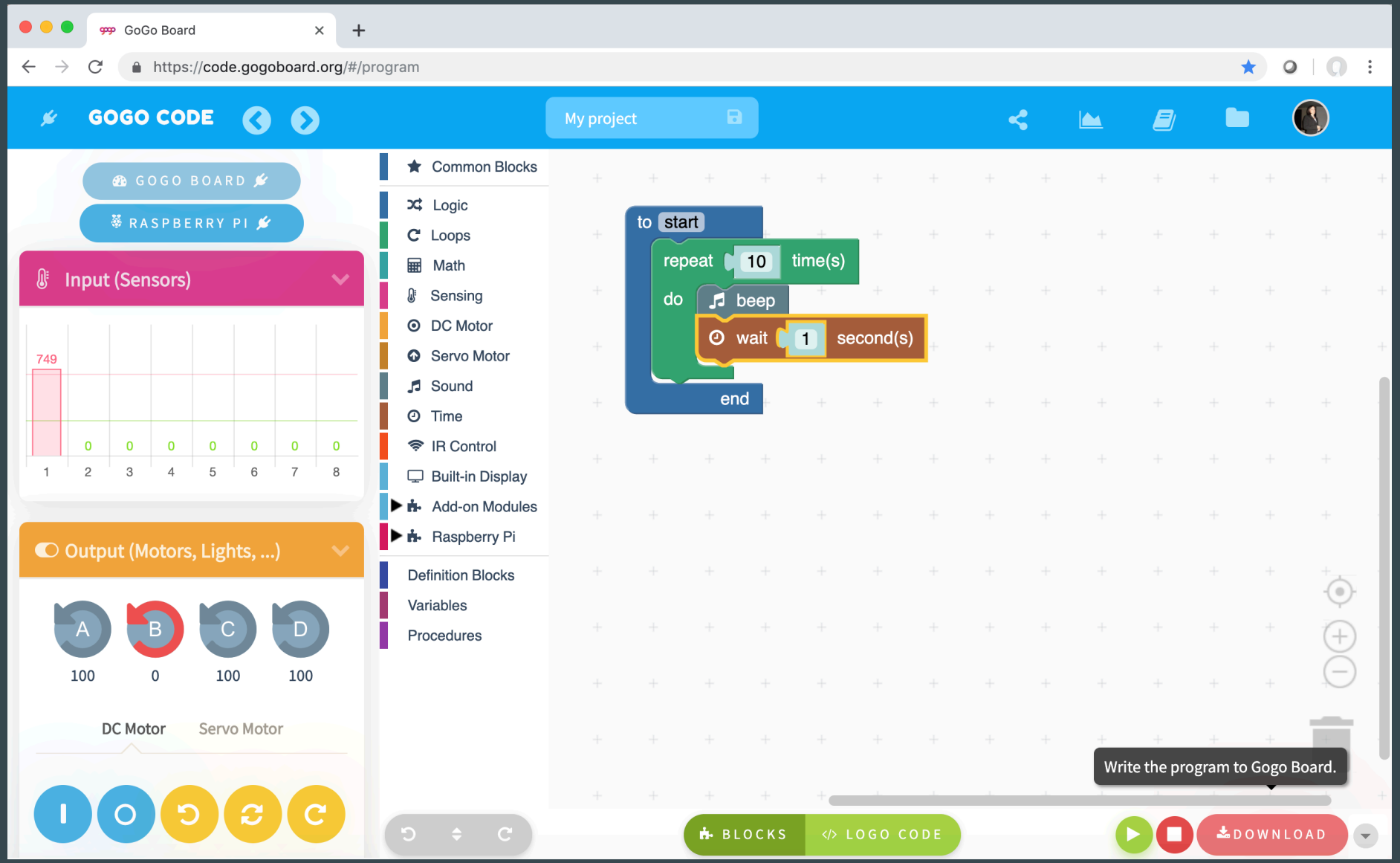
”Download” the program to the GoGo Board!

Simple procedure – Sound, insert a loop



What happens without a “Wait” block?

Simple procedure – Sound, insert a loop

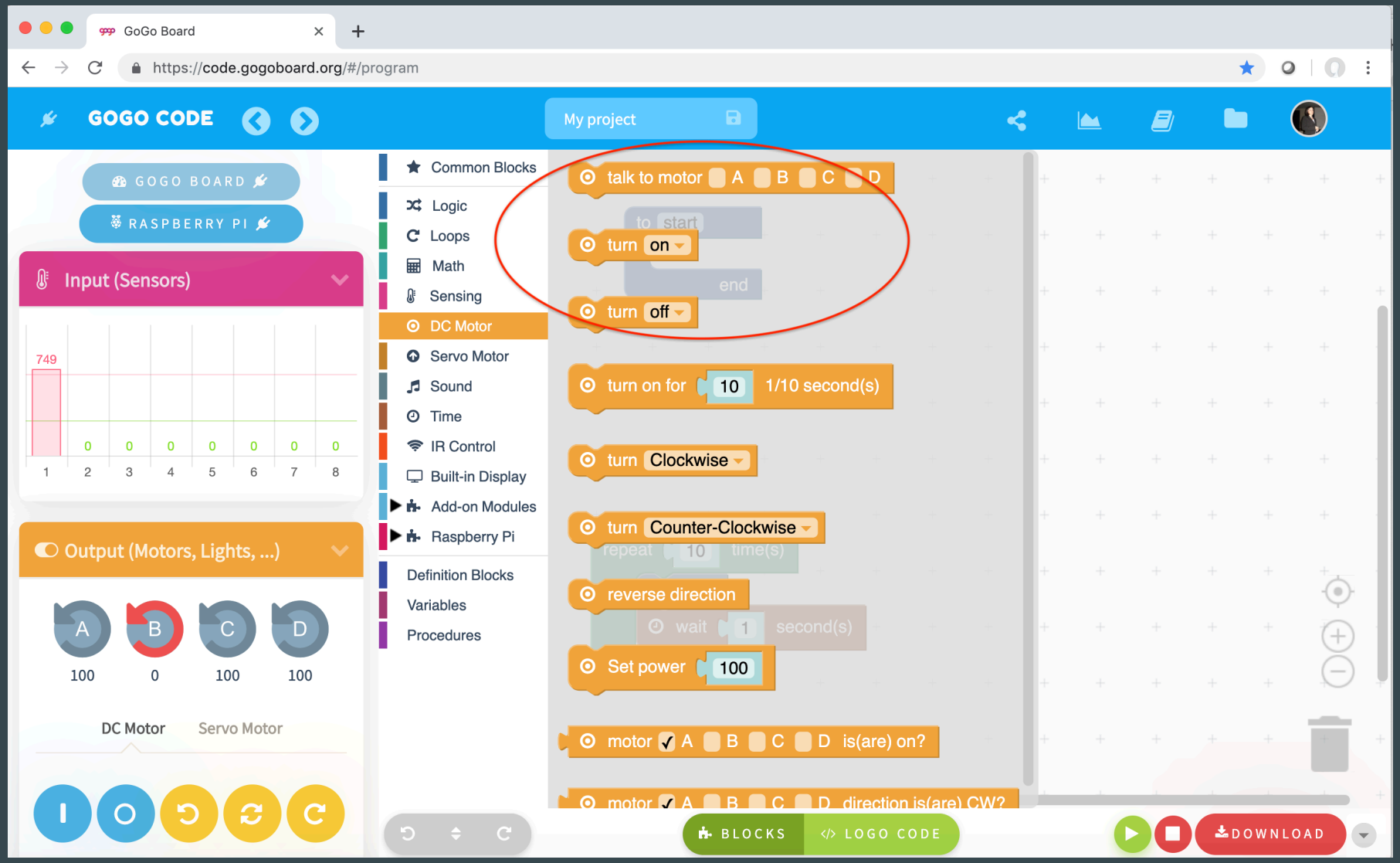


Explore using a “Repeat” and a “Wait” blocks

”Download” the program to the GoGo Board!

Explore!!
(10 min)

Simple procedure - Motors

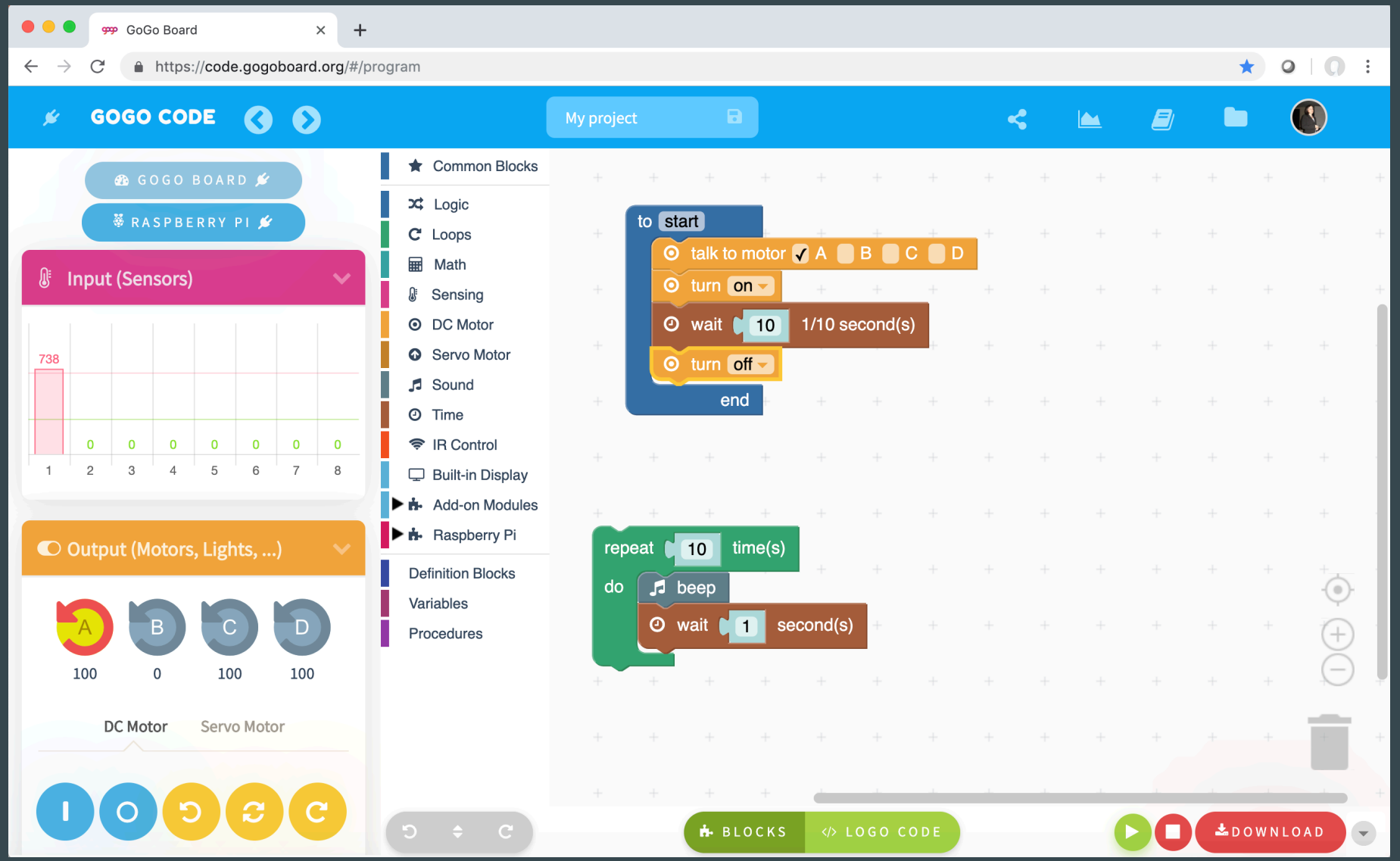


Connect Motor(s)

You need to a block to “talk” to the motor(s)

You need to a block to turn motor(s) on and off

Simple procedure - Motors

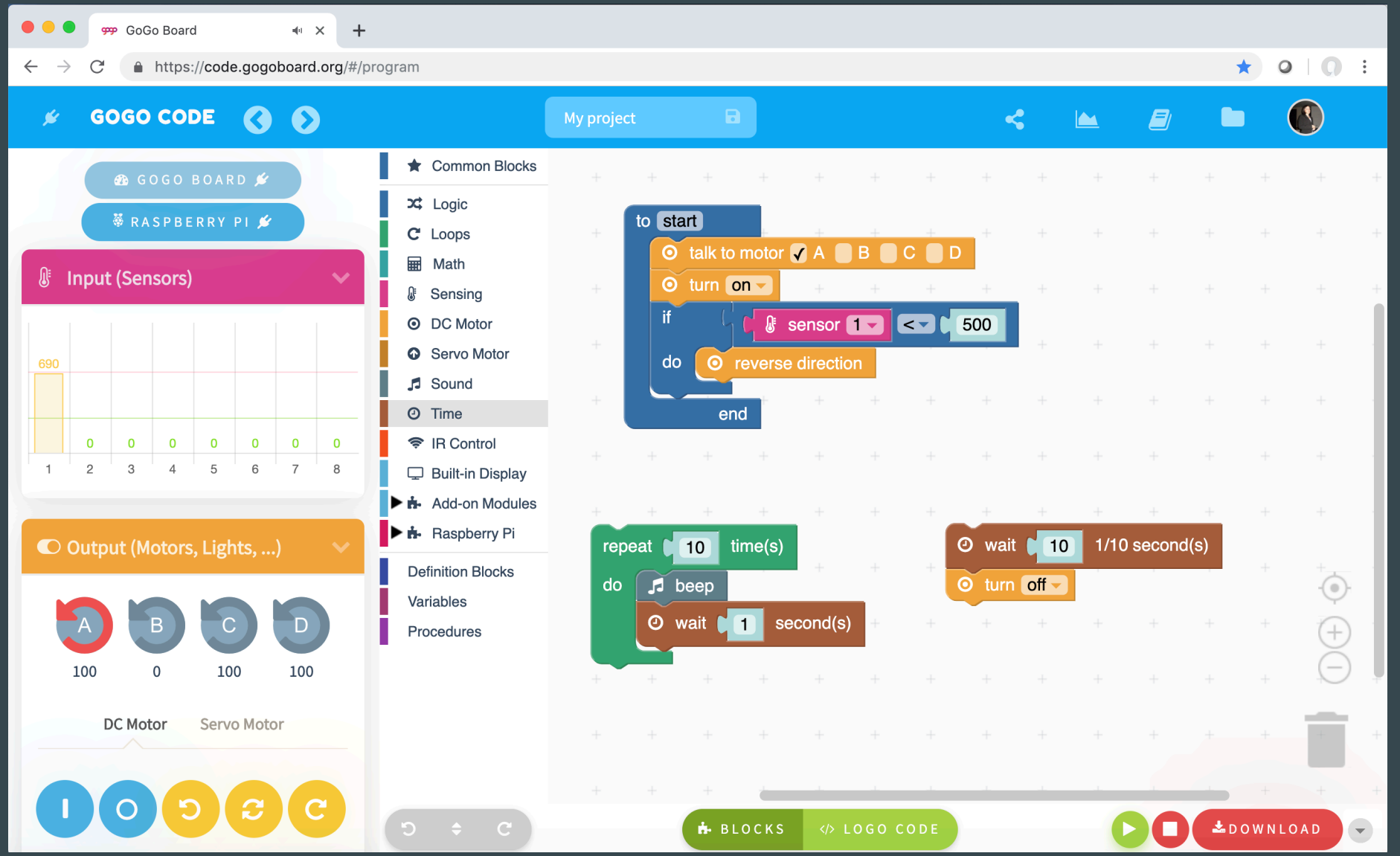


”Download” the program to the GoGo Board!

Challenges (15 min):

- Combine movement and sound
- Build a moving artifact and program it to move back and forth
- Others?

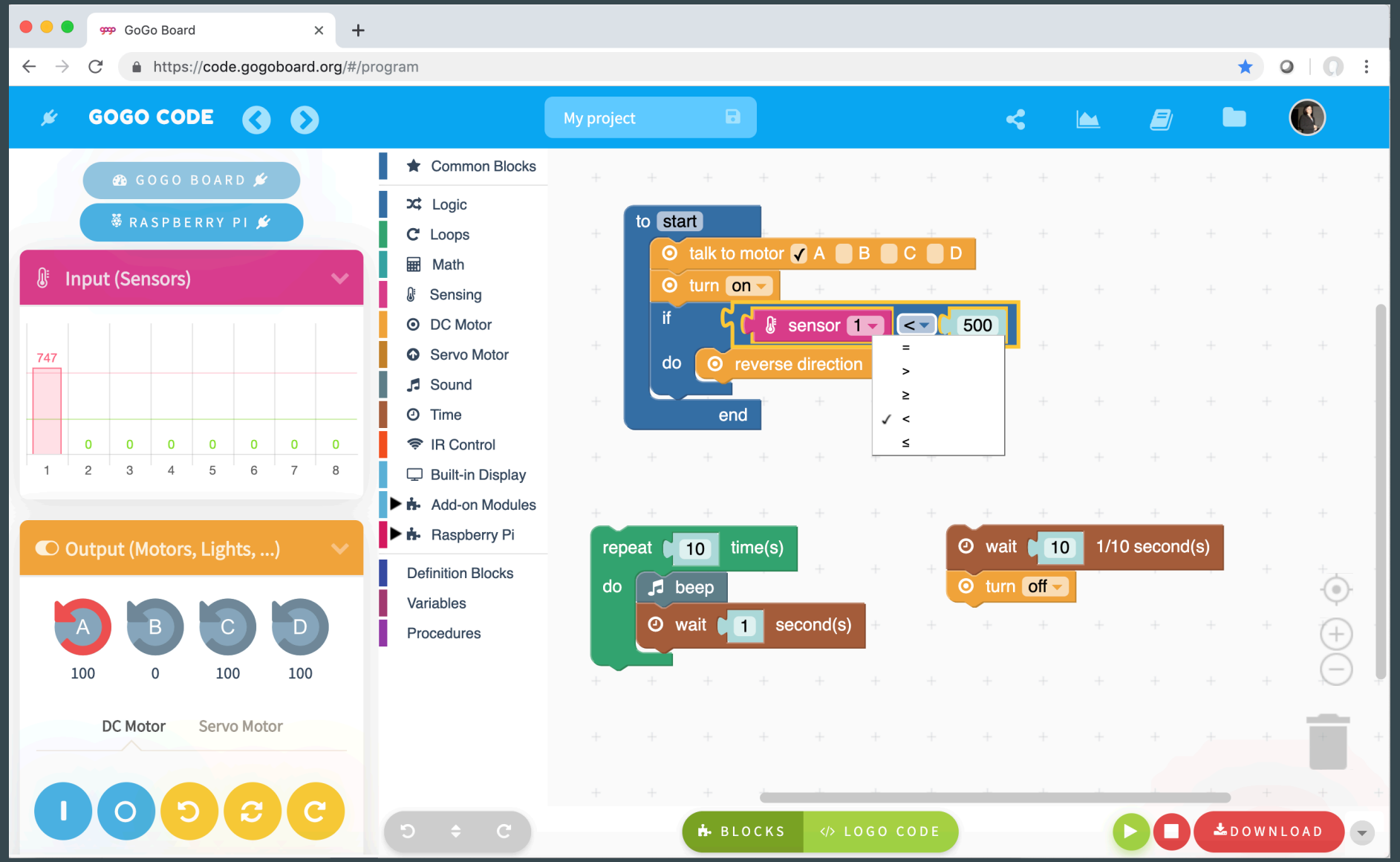
Control Motors



What if we can control the movement with a sensor?

Select a sensor and connect it to a sensor port!

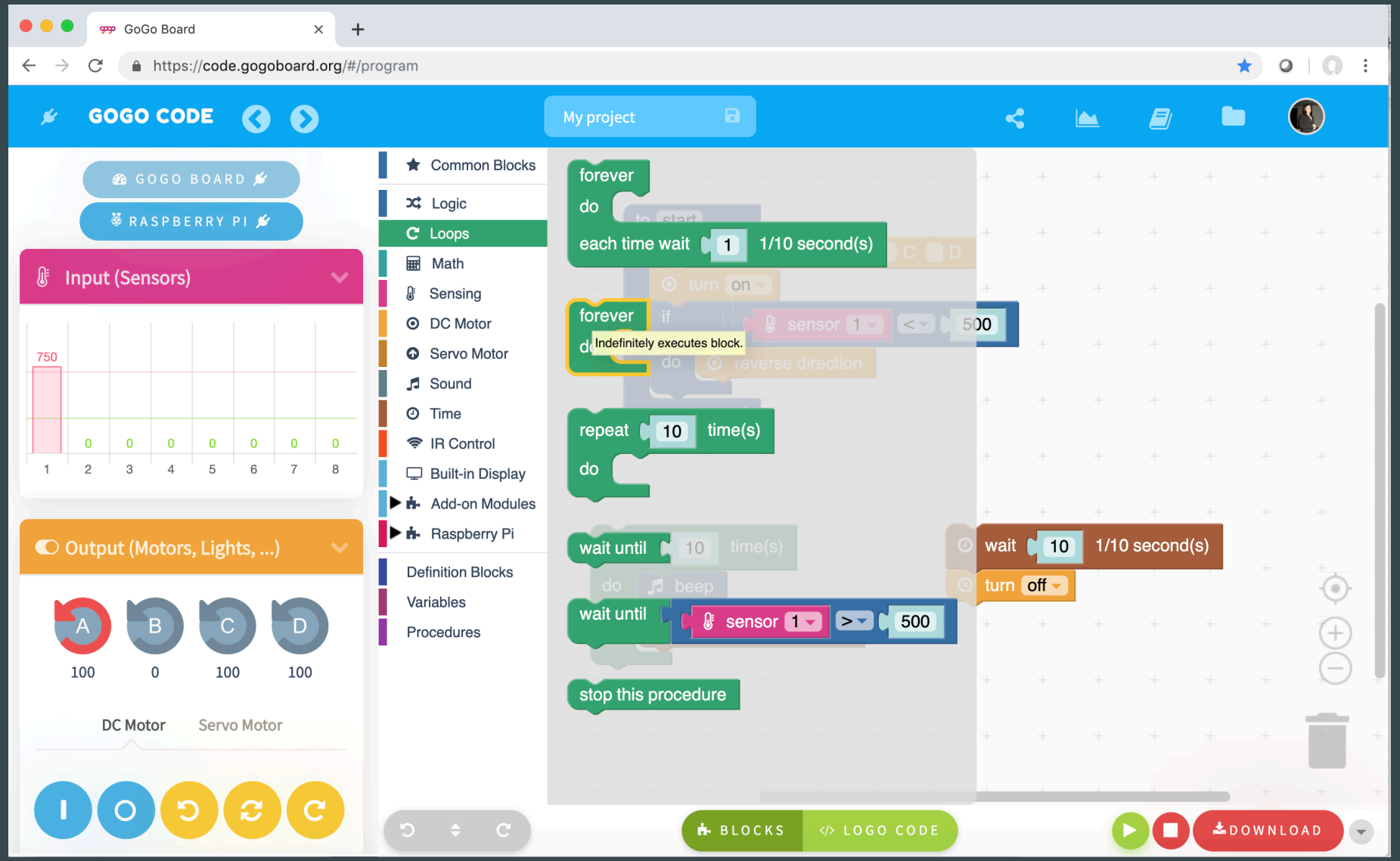
Control Motors



A light sensor reading is smaller than 500 when is dark!

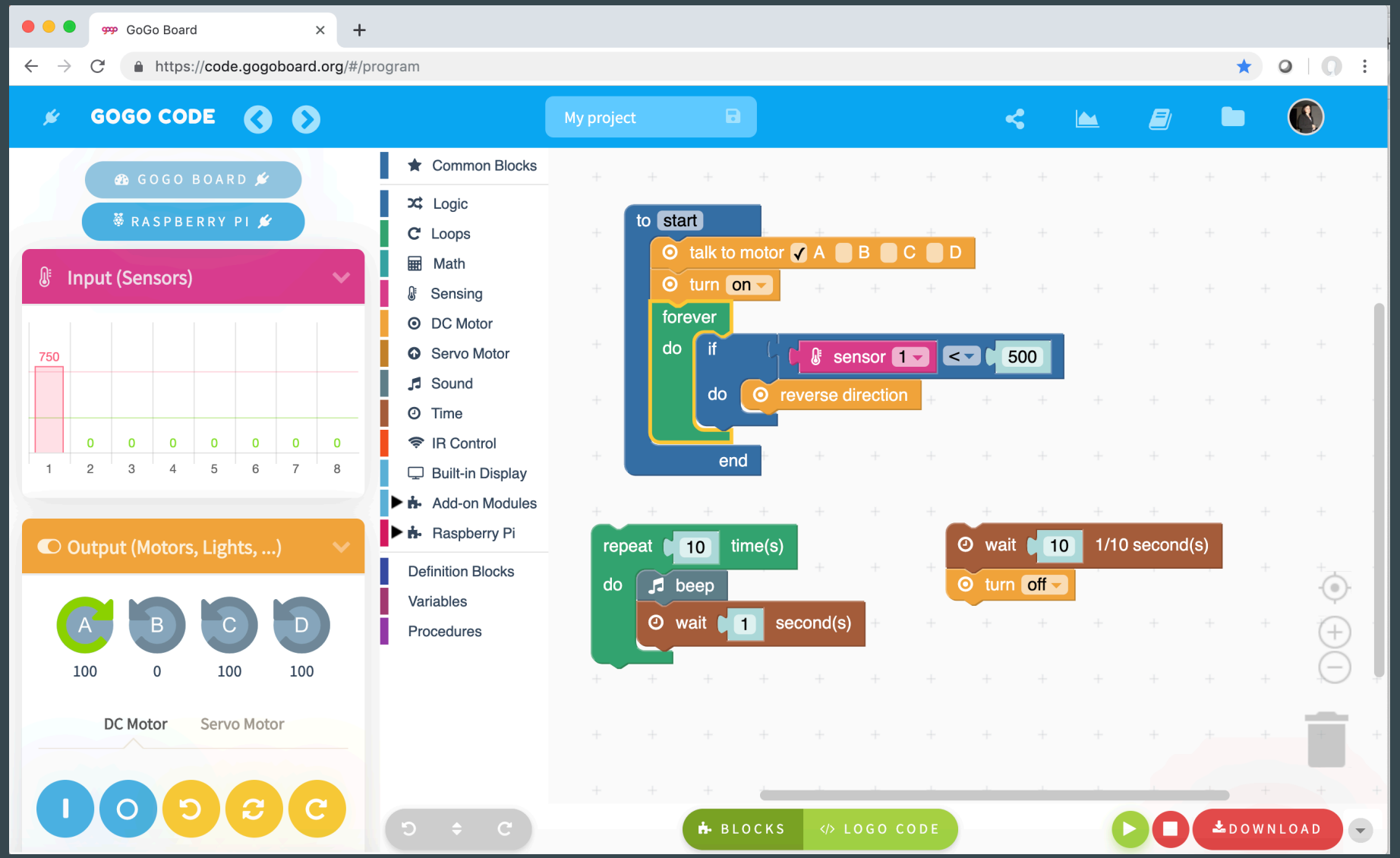
Calibrate your sensor!

Control Motors



What happens without a "Repeat" block?

Control Motors

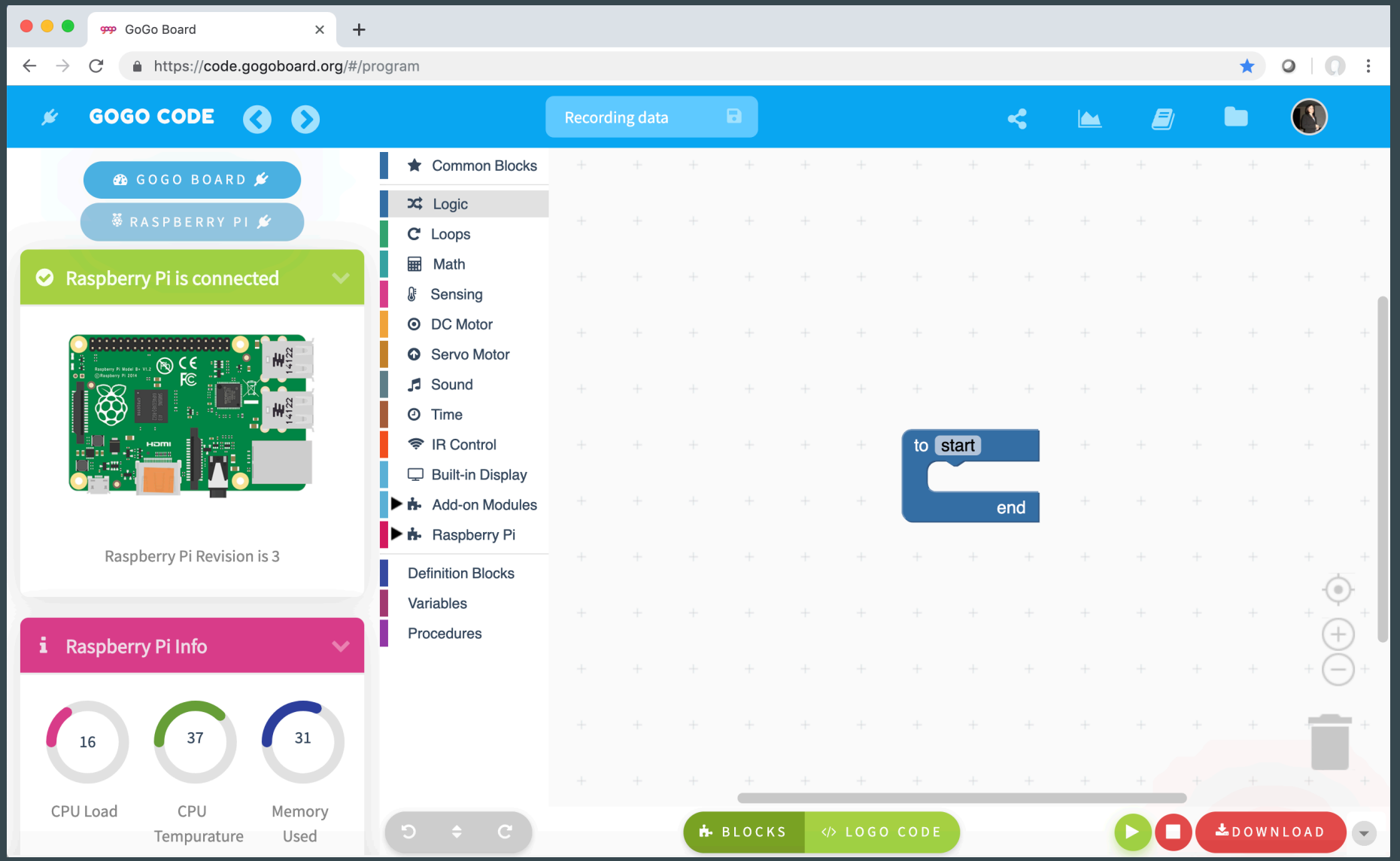


Explore and build your own artifact!

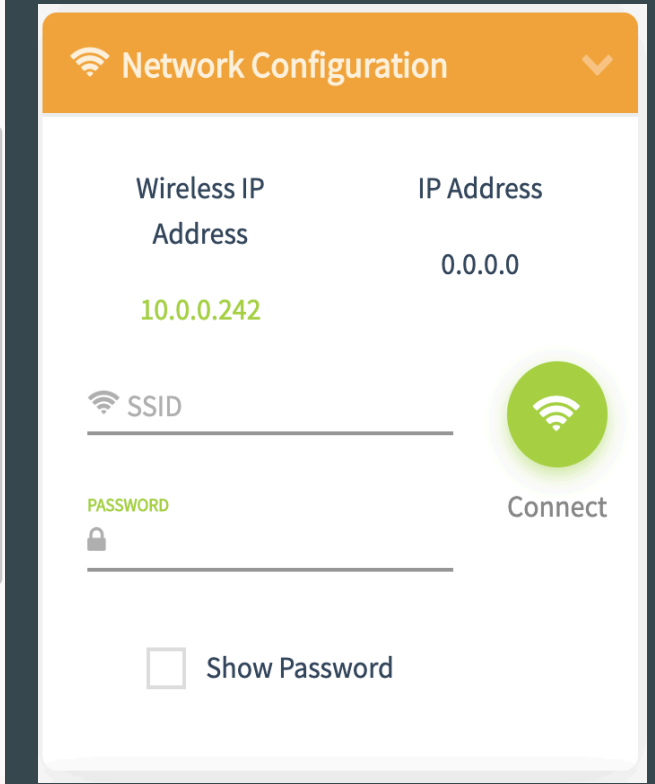
Challenges (30 min):

- Build a house alarm
- Turn a light on when it is dark
- Start a motor when soil is too dry
- Build a small car that avoids obstacles
- Other ideas?

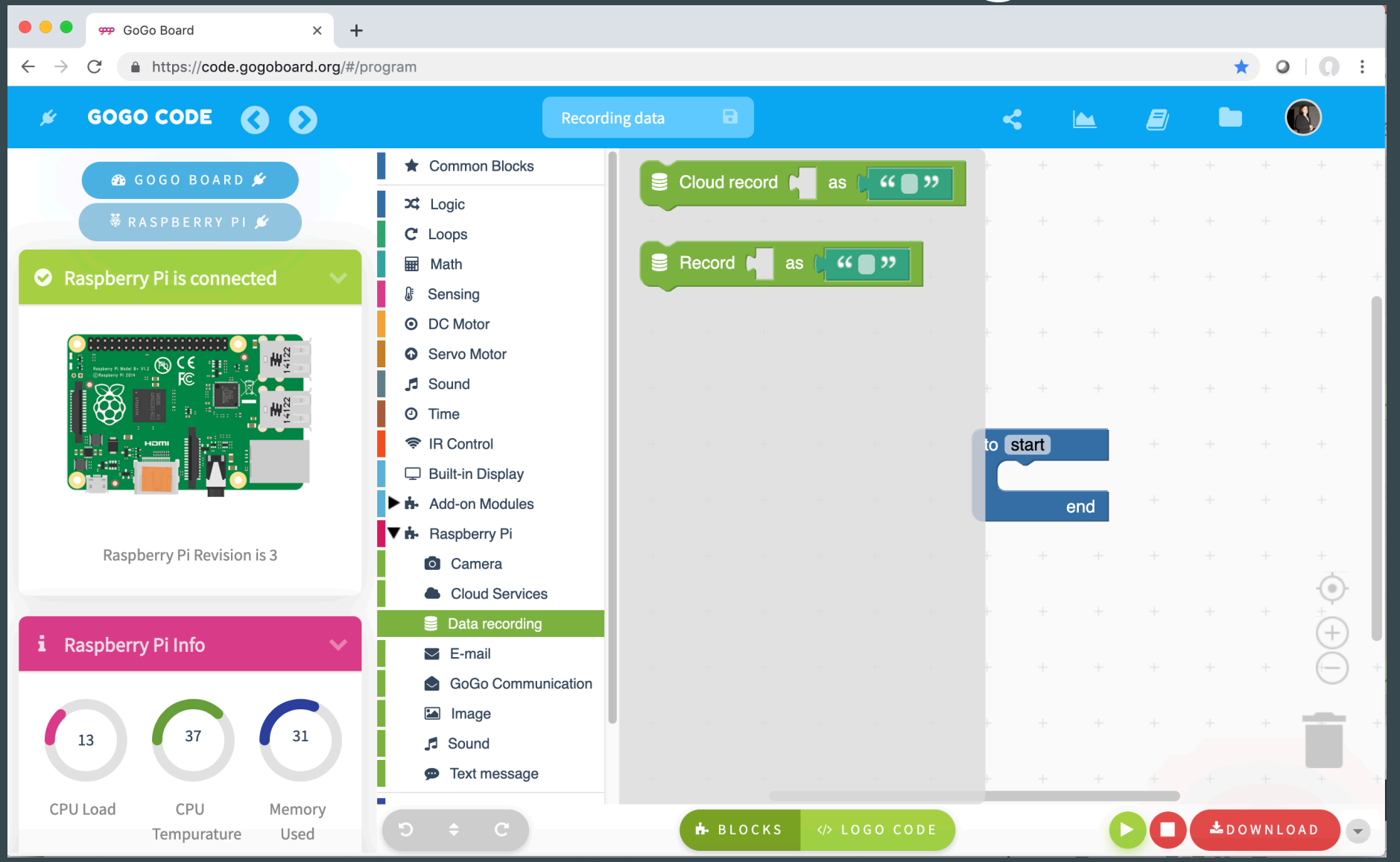
Recording data



Connect Rasberry Pi!

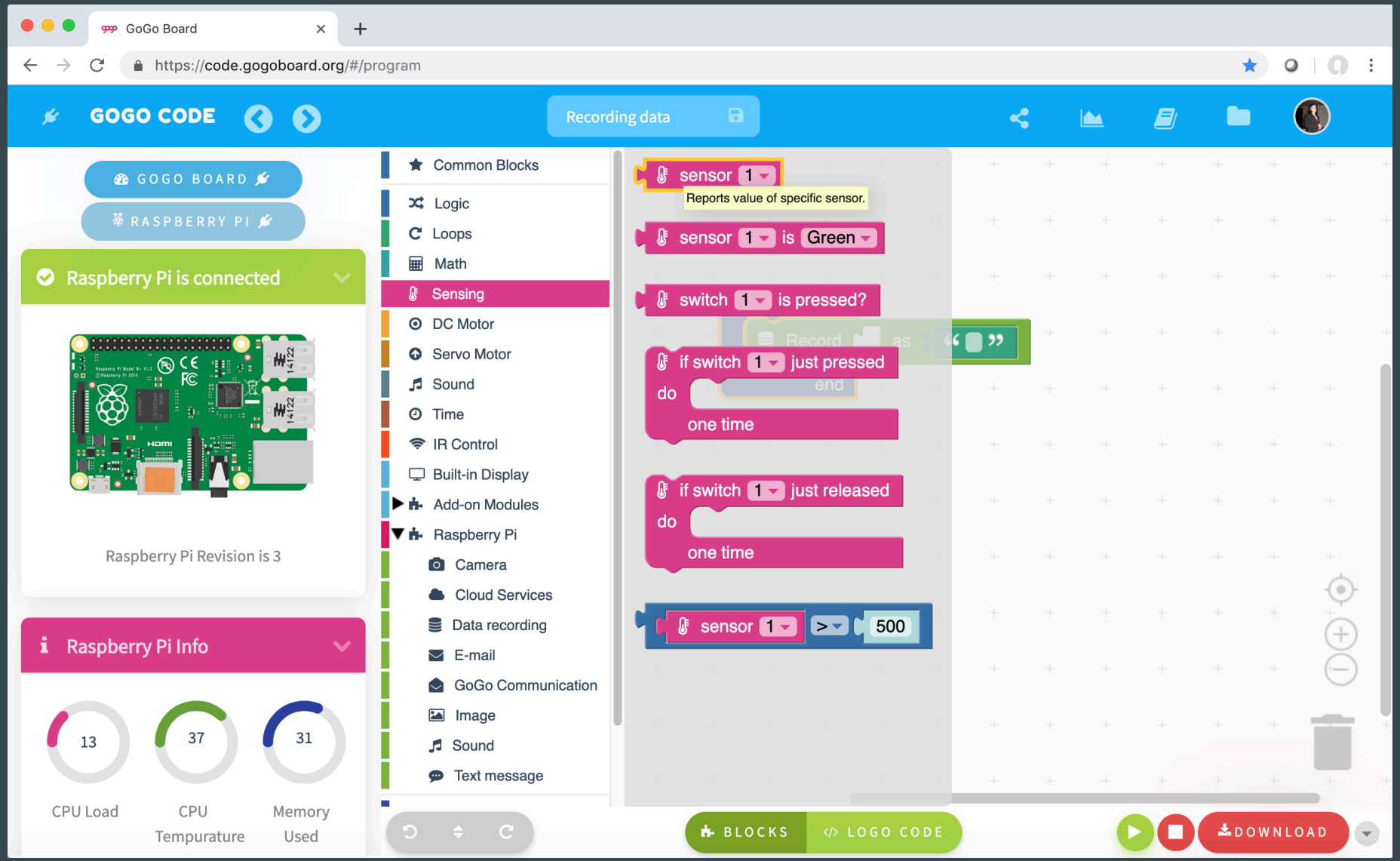


Recording data



Use “Record” block (from Rasberry Pi menu option)

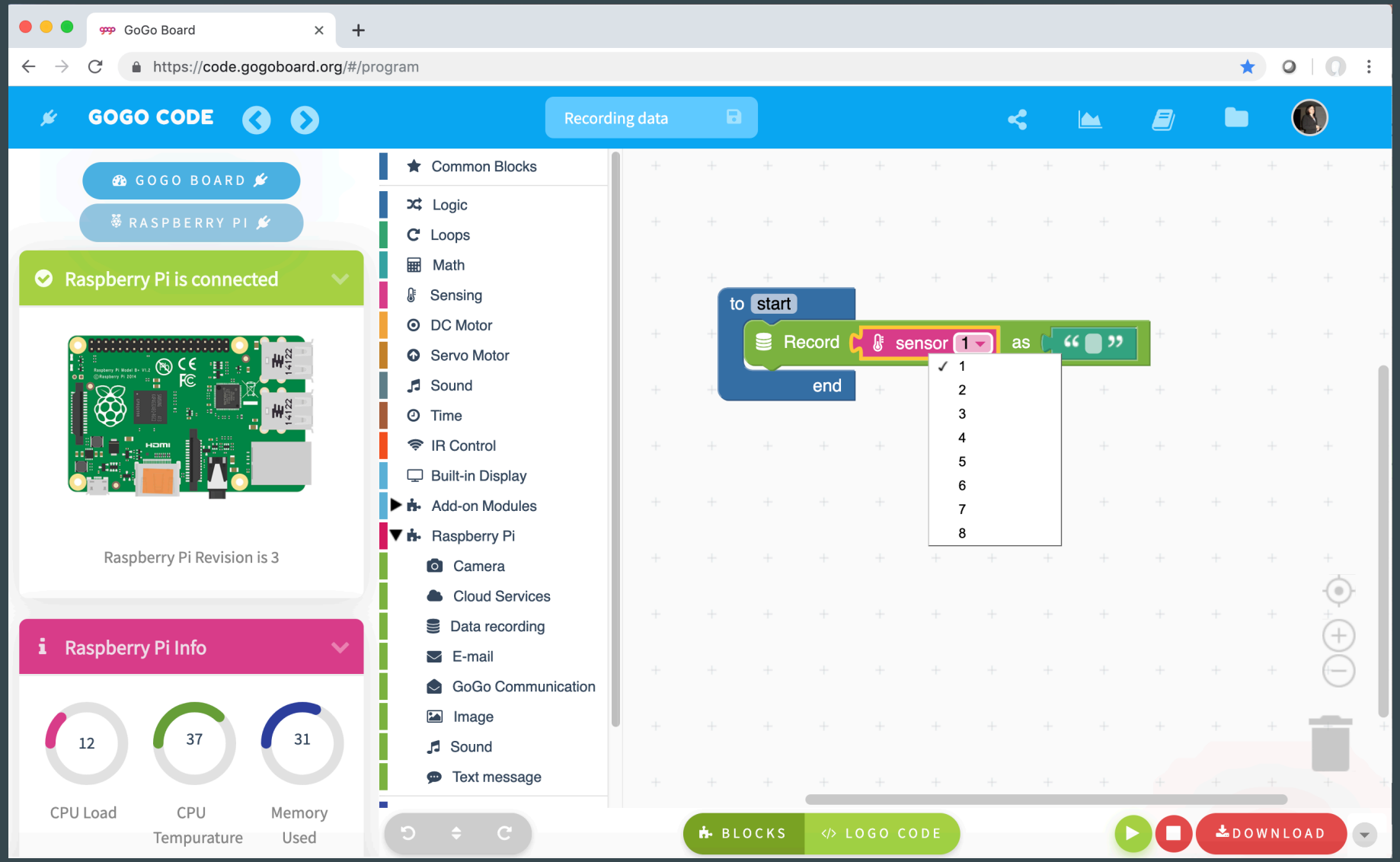
Recording data



Use “Record” block (from Rasberry Pi menu option)

Add a “sensor” block.

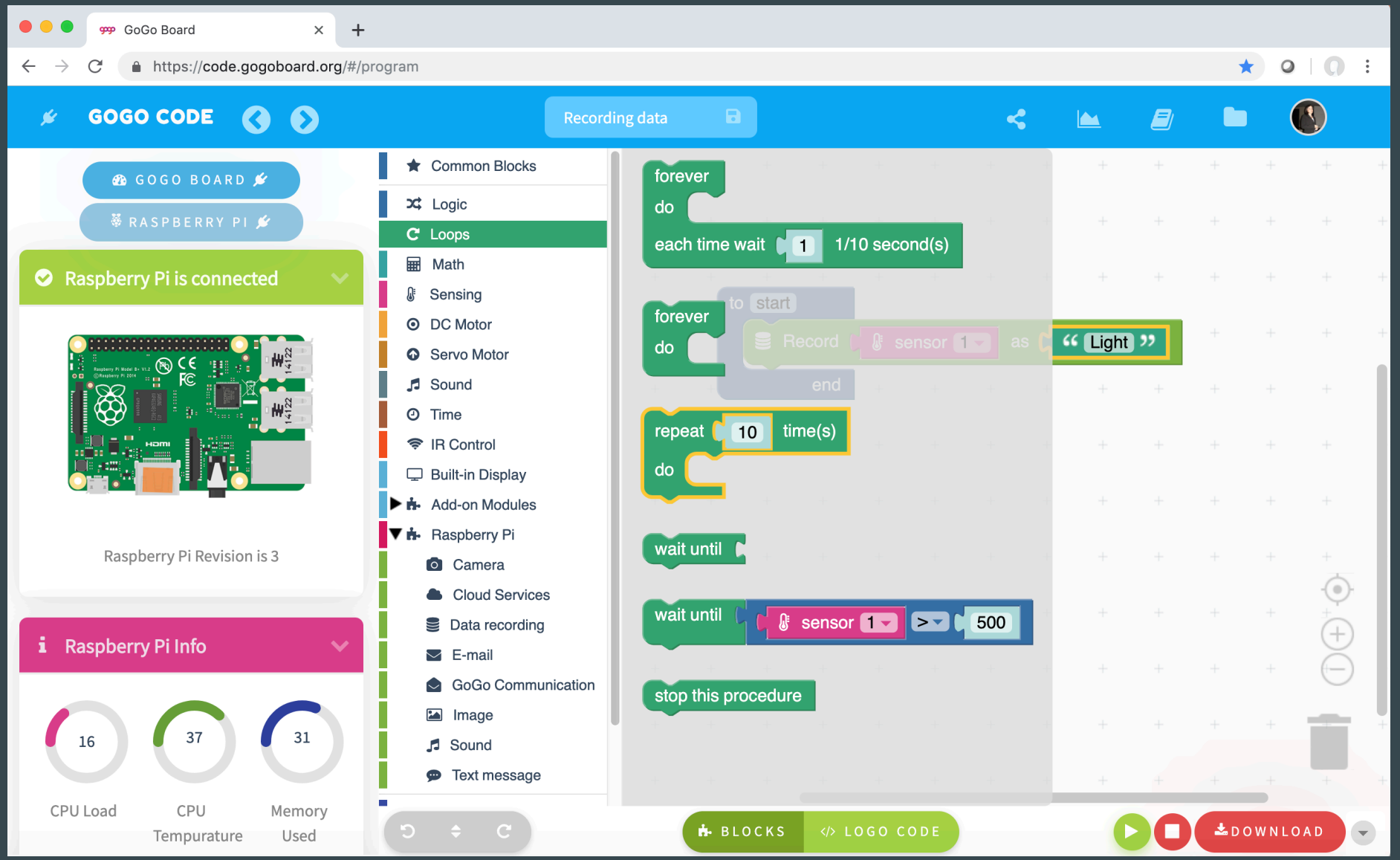
Recording data



Use “Record” block (from Rasberry Pi menu option)

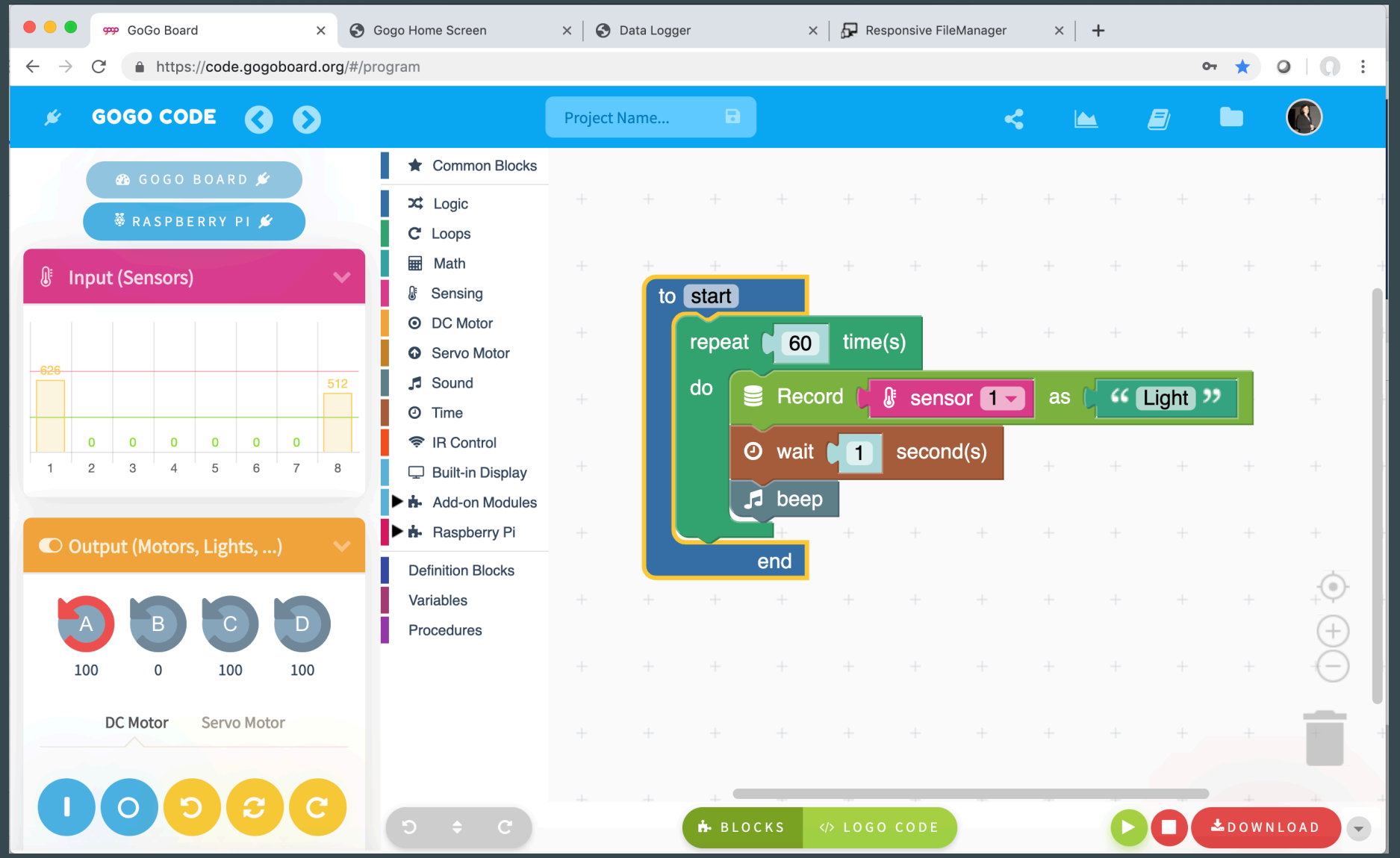
Add a “sensor” block. Make sure to select the correct port!

Recording data



Do we need a "Repeat" block?

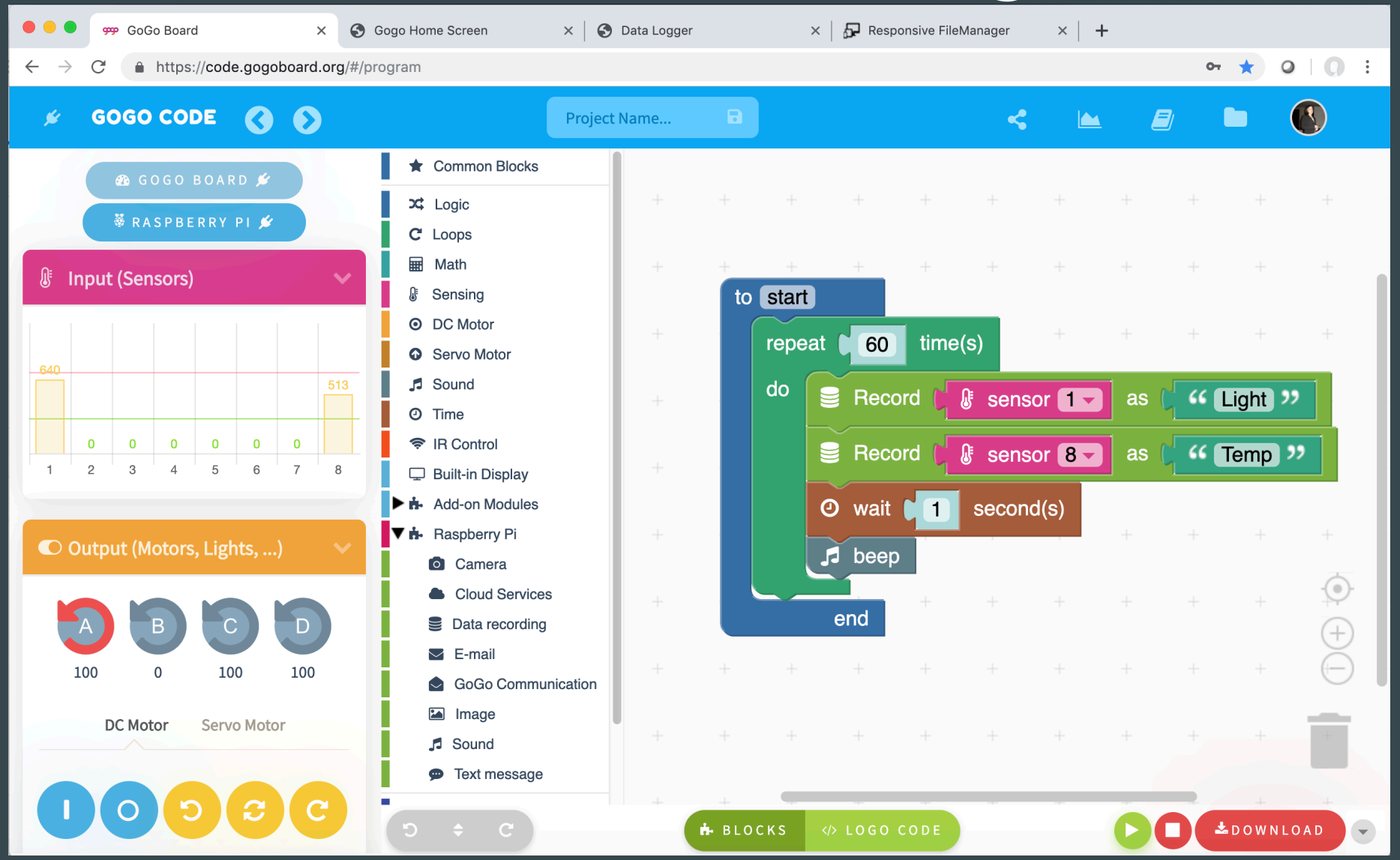
Recording data



Do we need a "Repeat" block?

How many times? How often we record?

Recording data

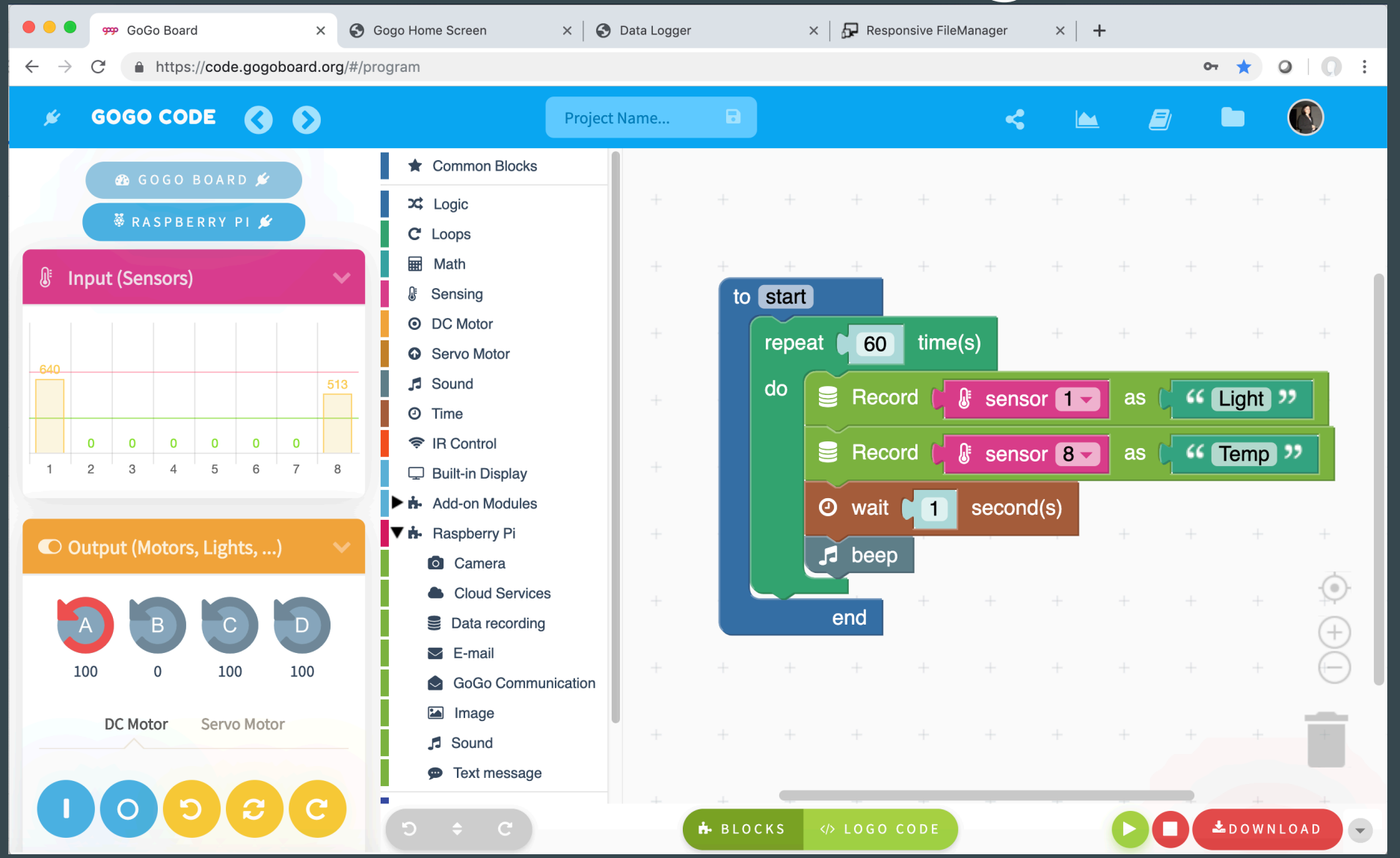


Do we need a "Repeat" block?

How many times? How often we record?

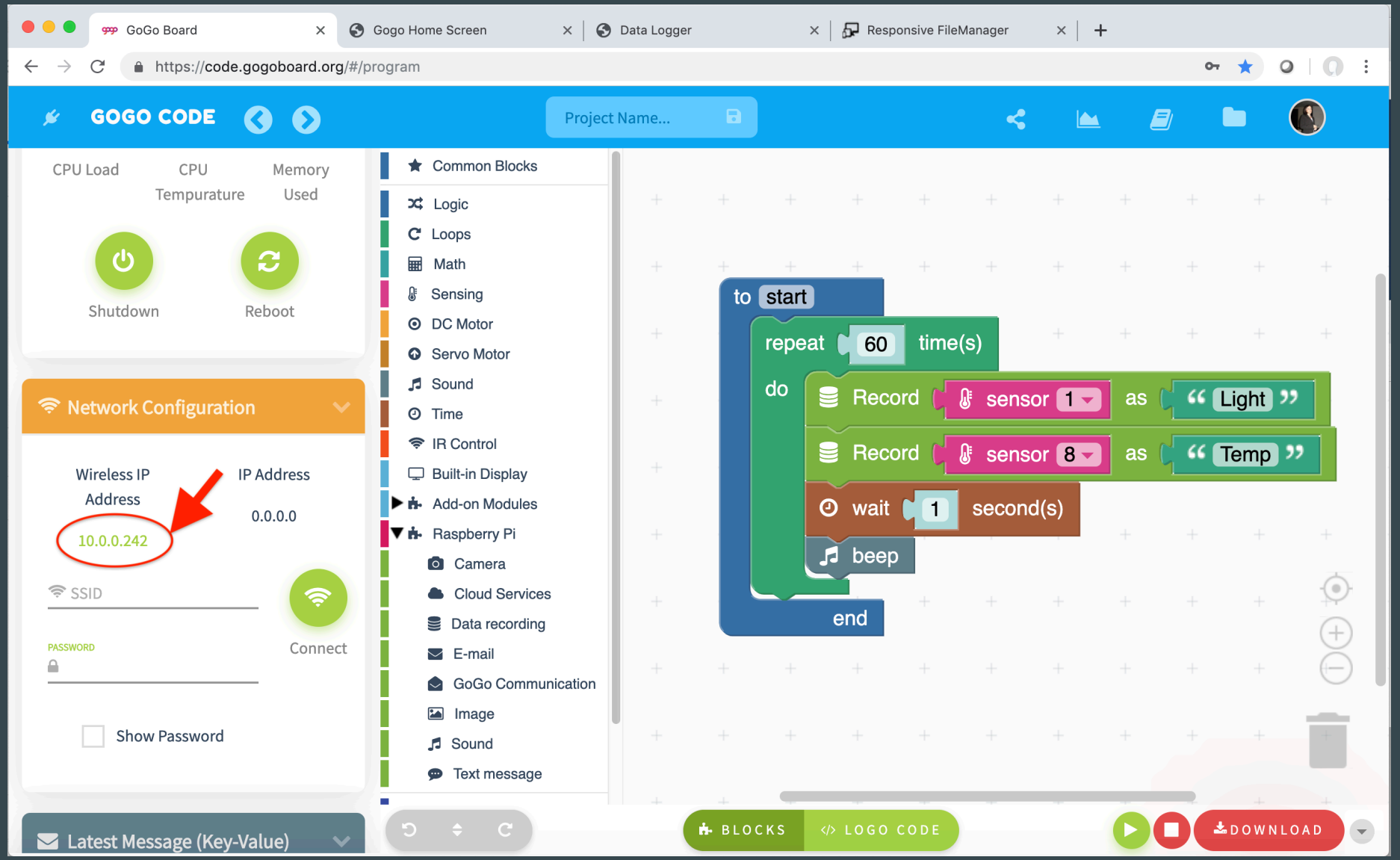
What about 2 sensors?

Recording data



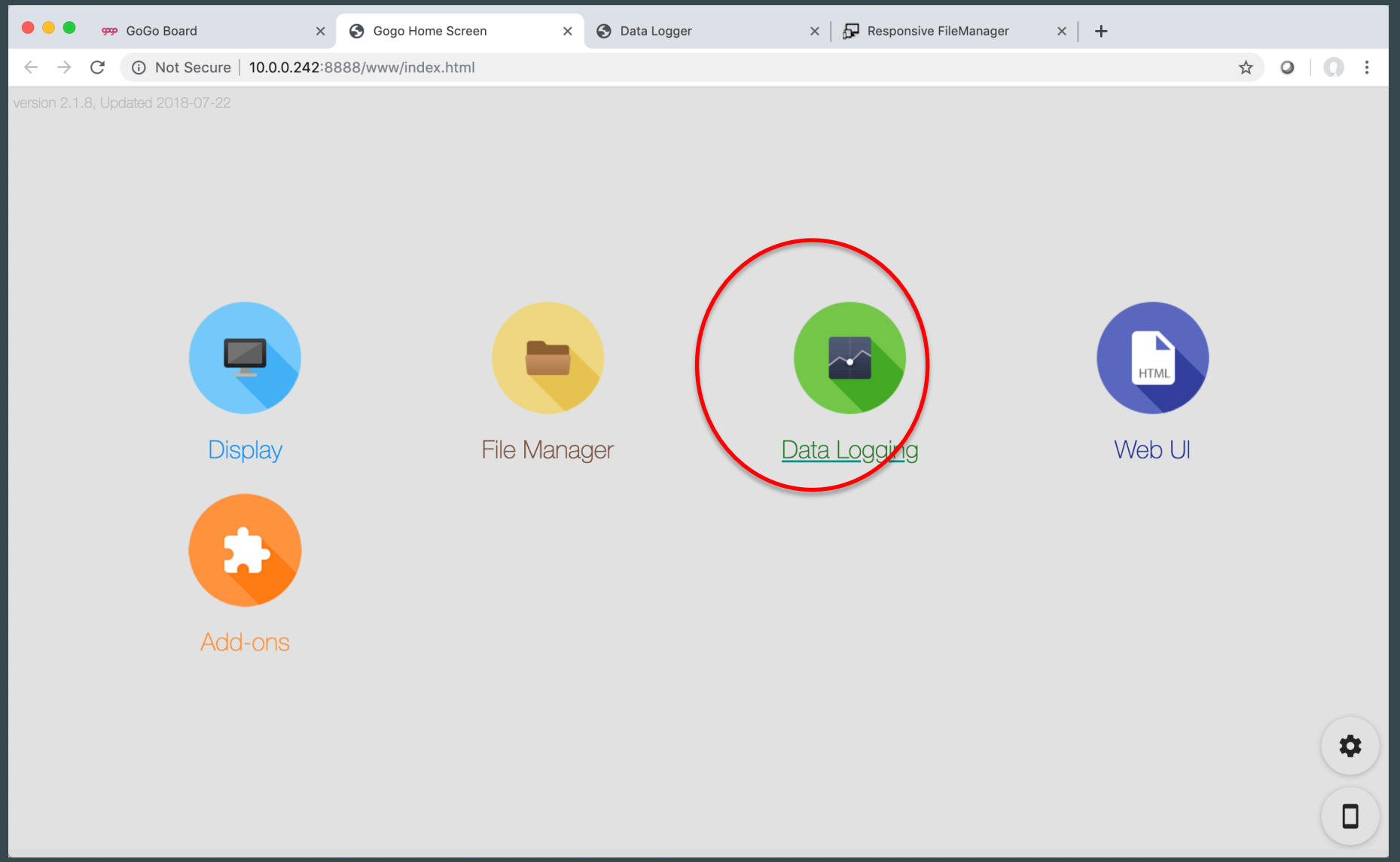
You can see data recording in real time!

See recording in real time!



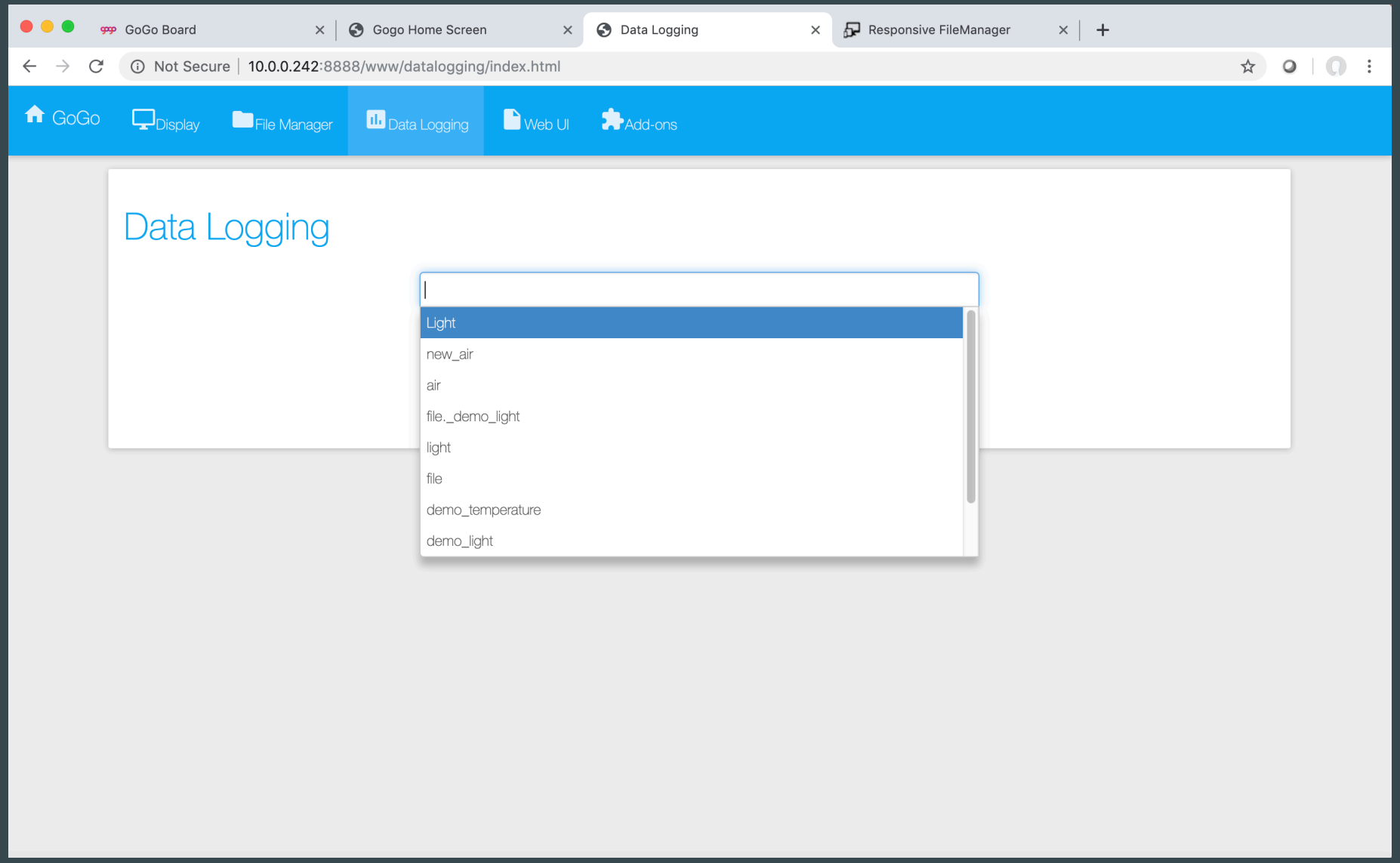
Click on the IP Address.

See recording in real time!



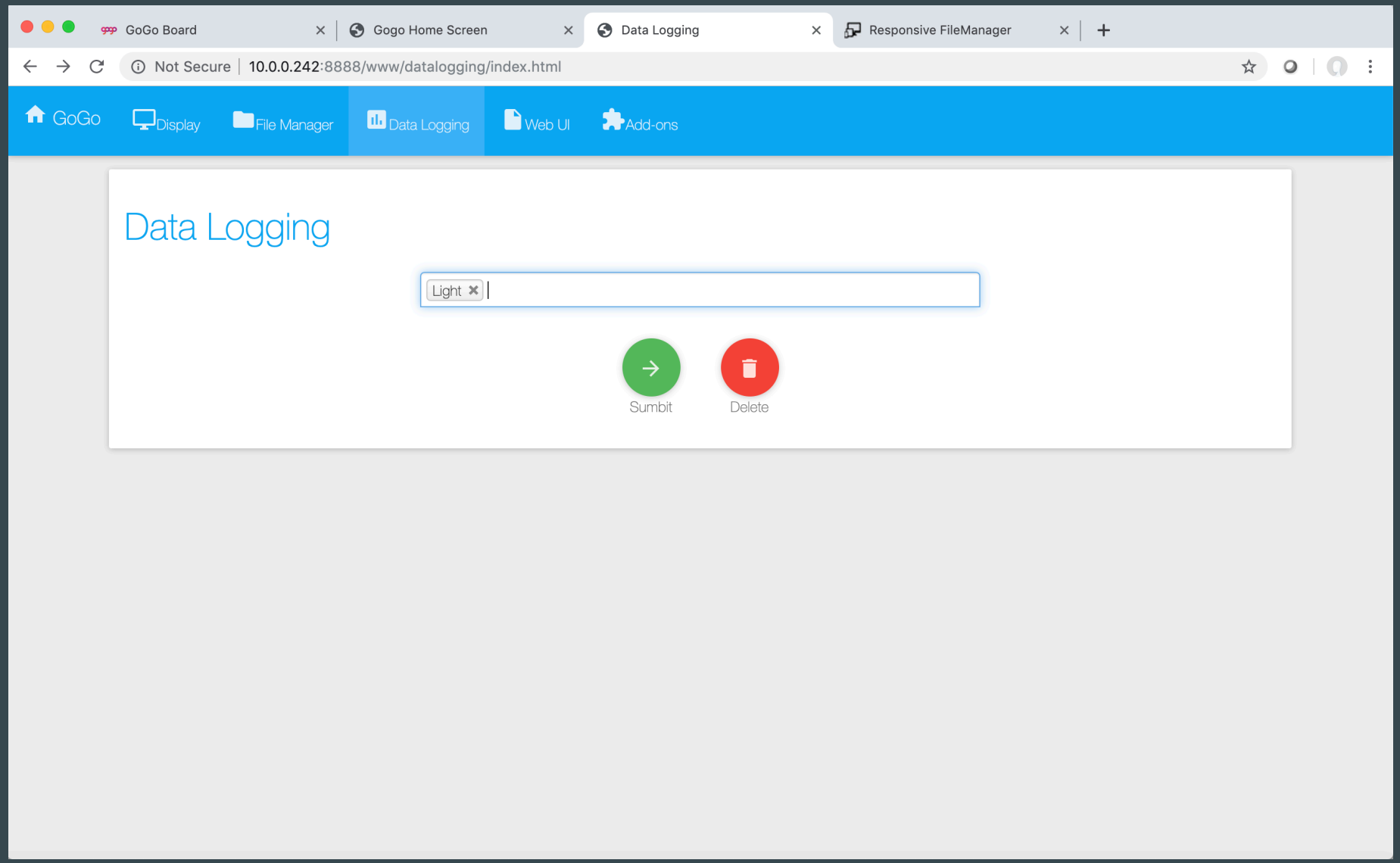
Select Data Logging!

See recording in real time!



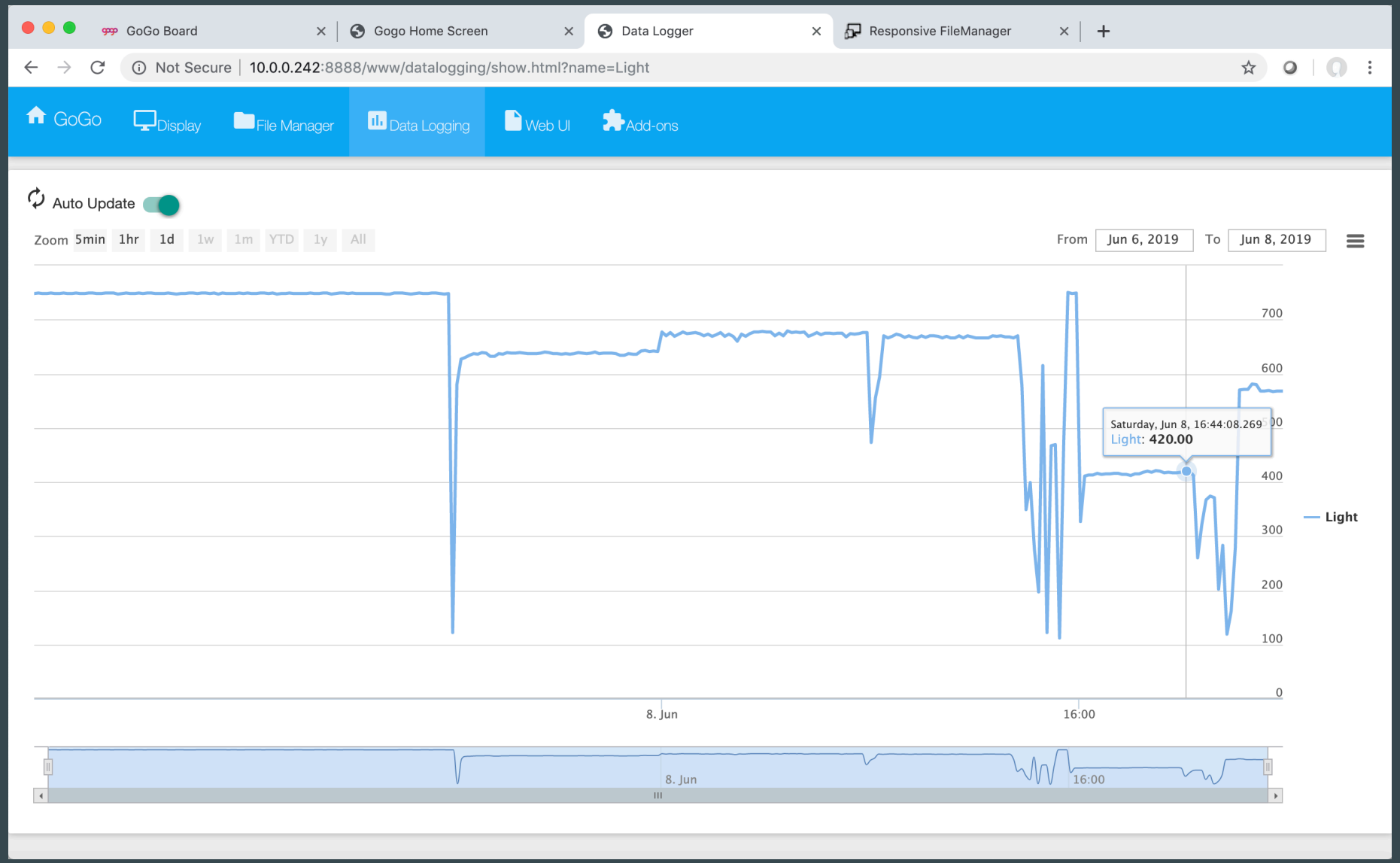
Select the sensor you want to watch!

See recording in real time!



Select the sensor you want to watch!

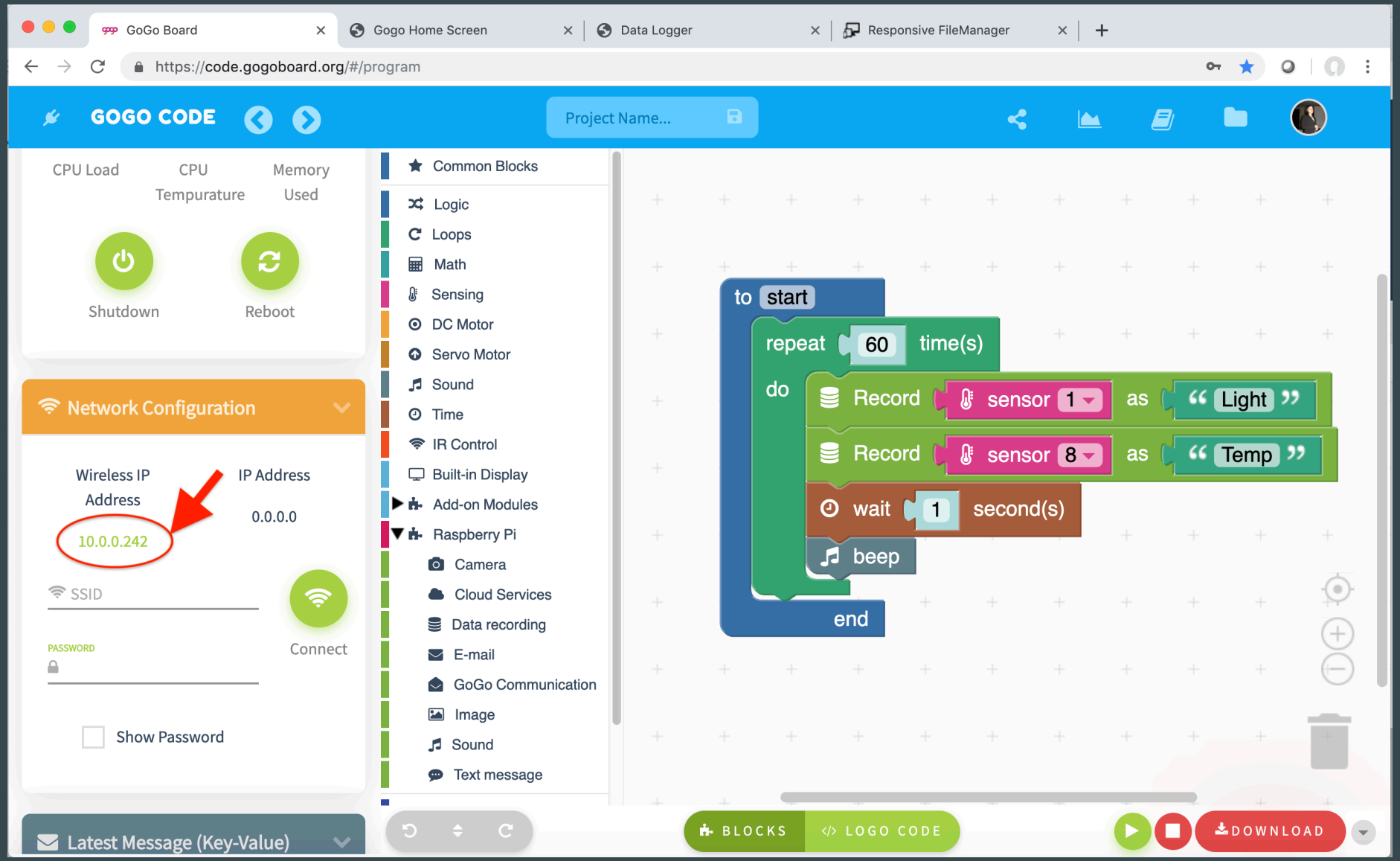
See recording in real time!



Can you make the sensor input change?

Design your own experiment, go outside and collect some data!!
Tips: Record for 2 min

Retrieve data

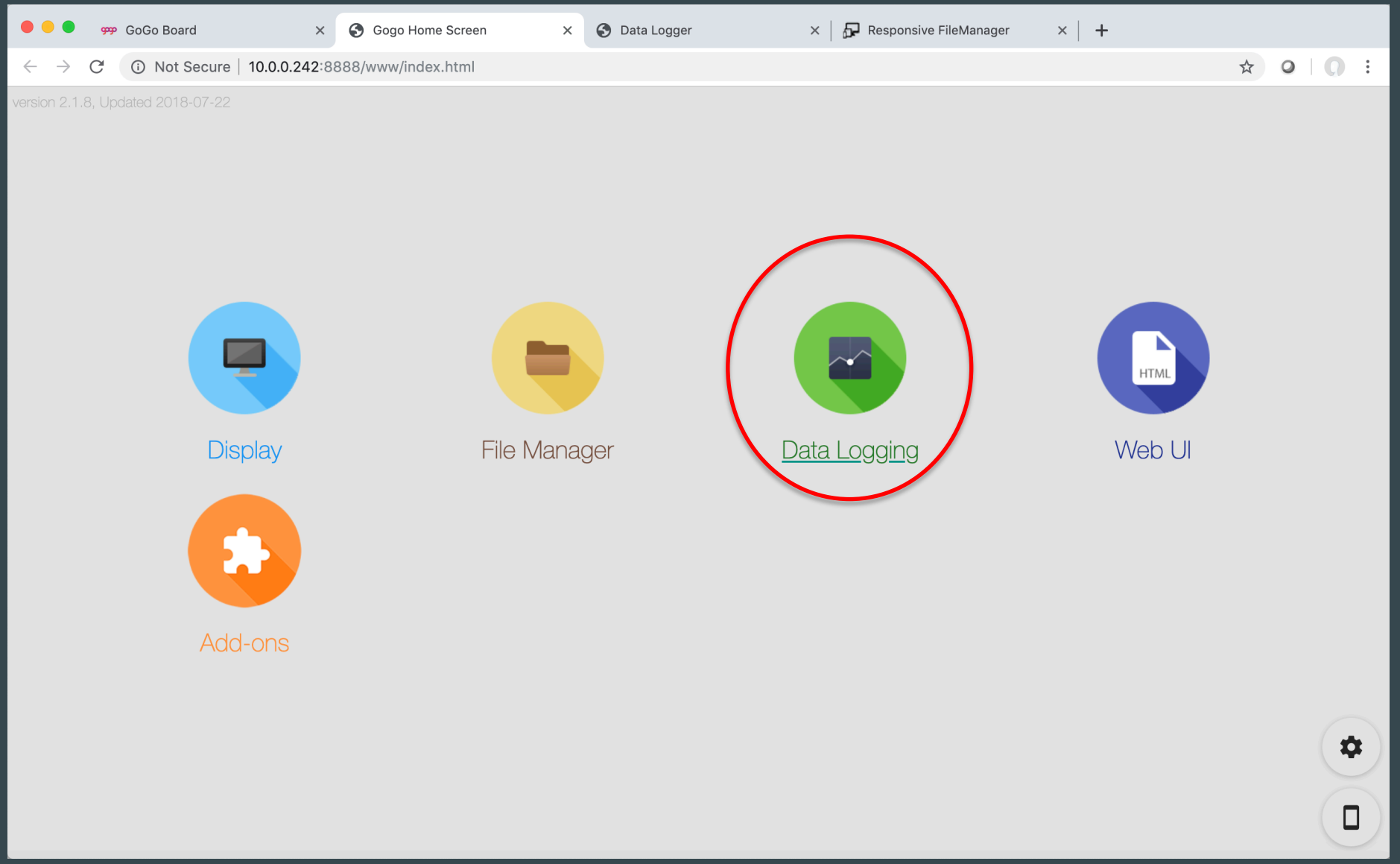


Connect the GoGo Board back into your computer.

Make sure the Rasberry Pi is connected.

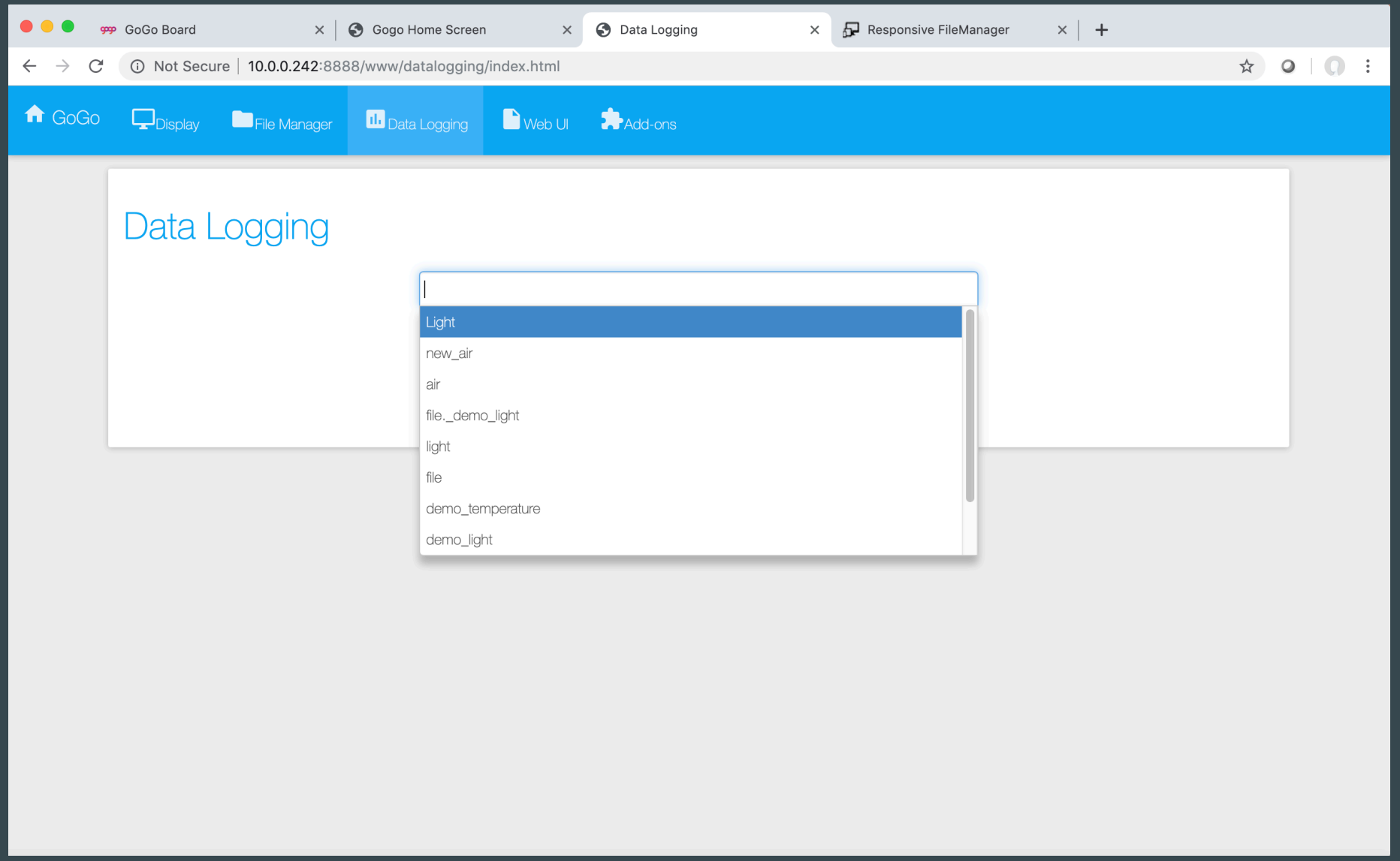
Click on the IP Address.

Retrieve data



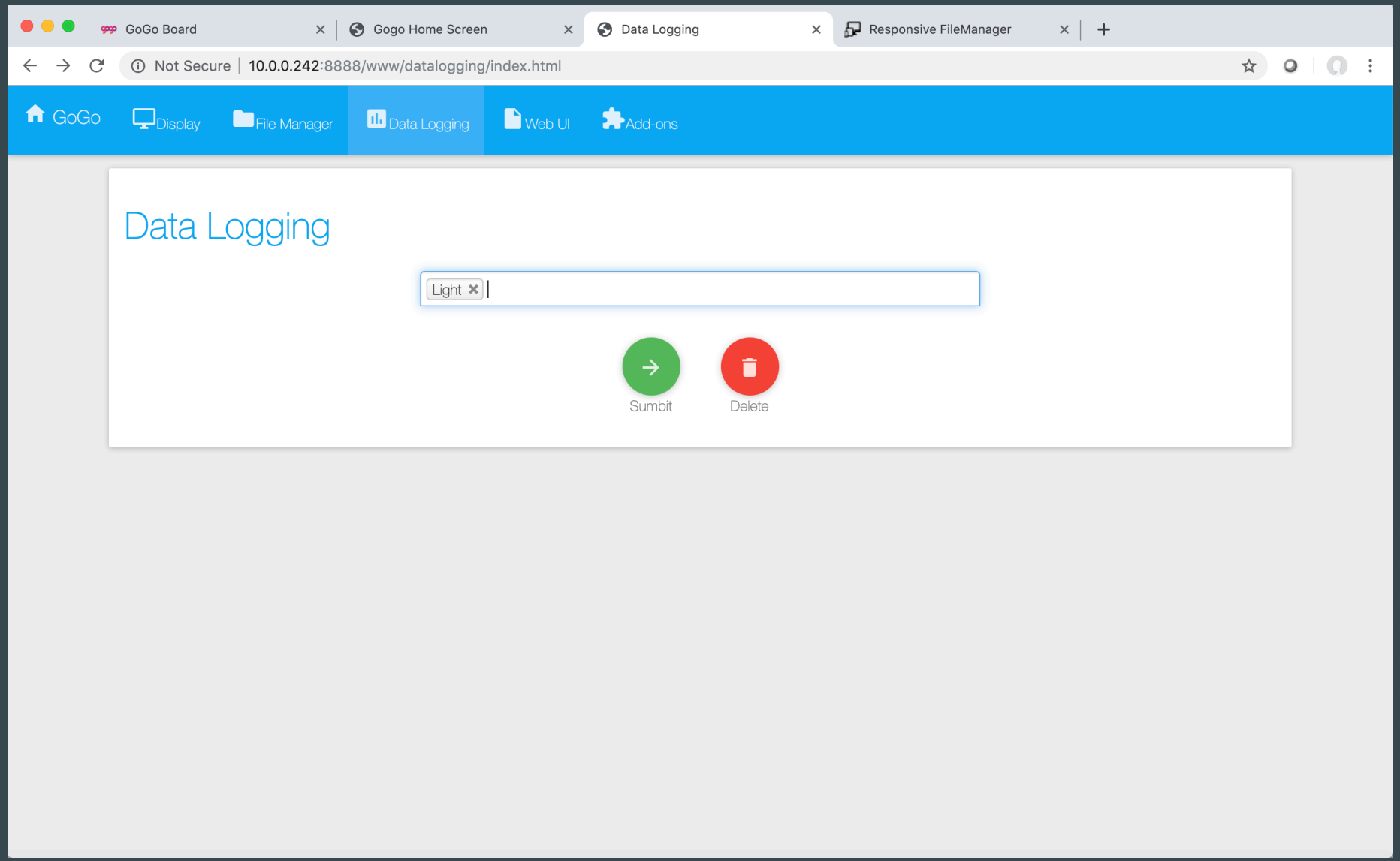
Select Data Logging!

Retrieve data



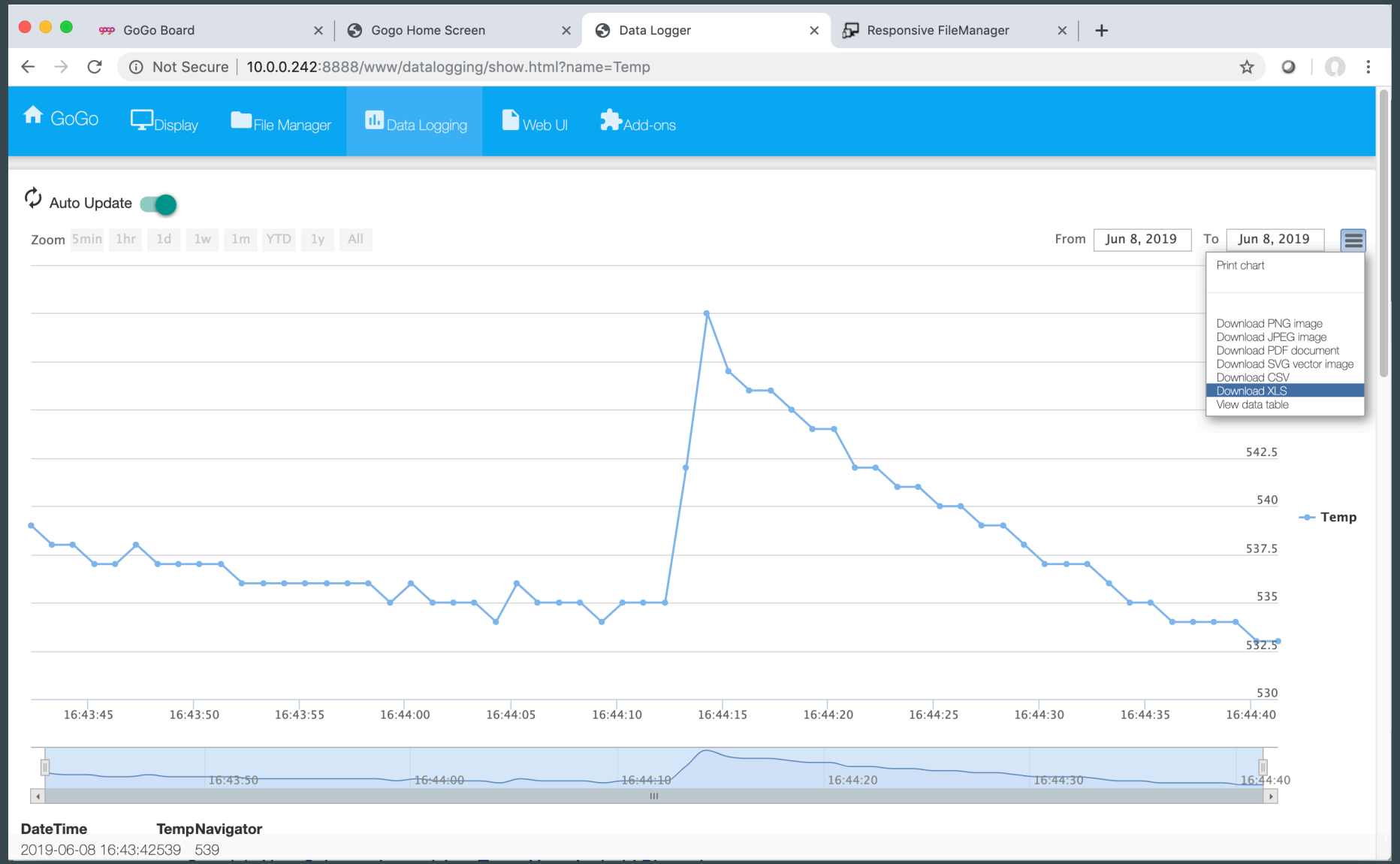
Select the data you recorded!

Retrieve data



Select the data you recorded!

Retrieve data



What does your data says?

You can also download and open the data file using a spreadsheet!

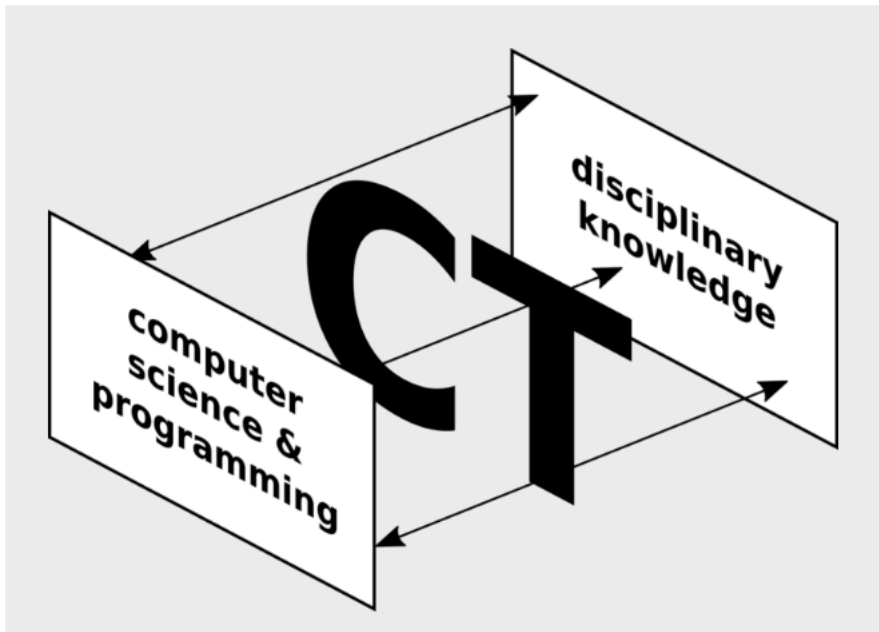
Share!!

Why are these ideas important?

Papert's Constructionism 1980

- People "build" knowledge
- Impersonal/abstract learning makes us hate education
- Some ideas are more powerful than others (Microworlds)
- Computing is necessary to make powerful representations of ideas personal and concrete (Logo)
- Learning should be facilitated by teachers and mentors. It should not be a memorization/recitation process.

Developing a Framework for Computational Thinking



Computational Thinking is formulating problems and their solutions in a way that a machine (computer) can be used to represent the problem and carry out its solution.

1. Understand (complex) systems.
2. Innovate with computational representations.
3. Design solutions that leverage computational power/resources.
4. Engage in collective sense making around data.
5. Understand potential consequences of actions.