

# SNP –Tech Wednesday - Class #3 – 2018Apr25

Using 2 IR Breakers to calculate the speed on an Object



Markus van Kempen

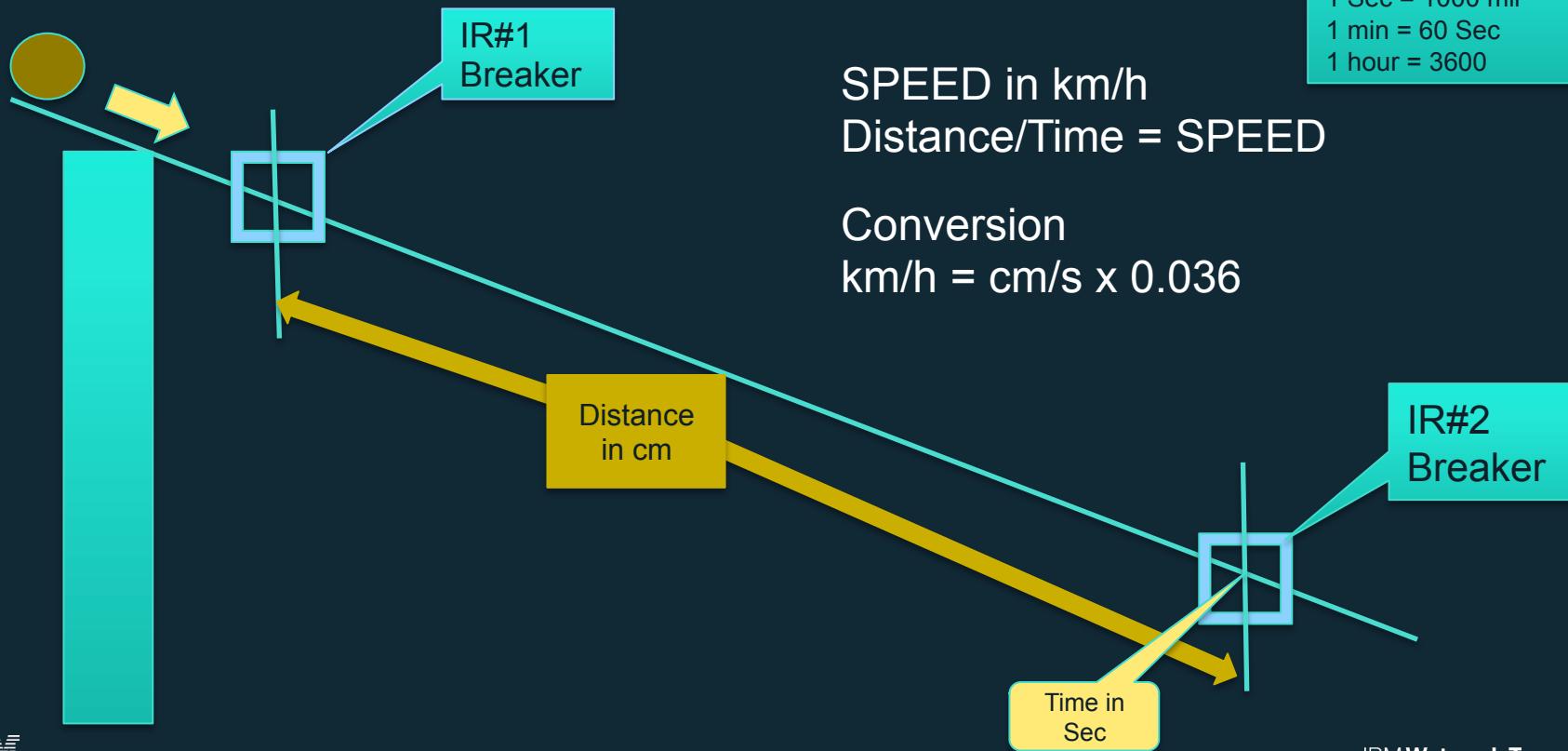
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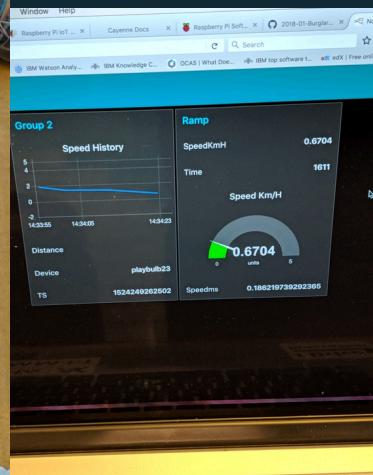
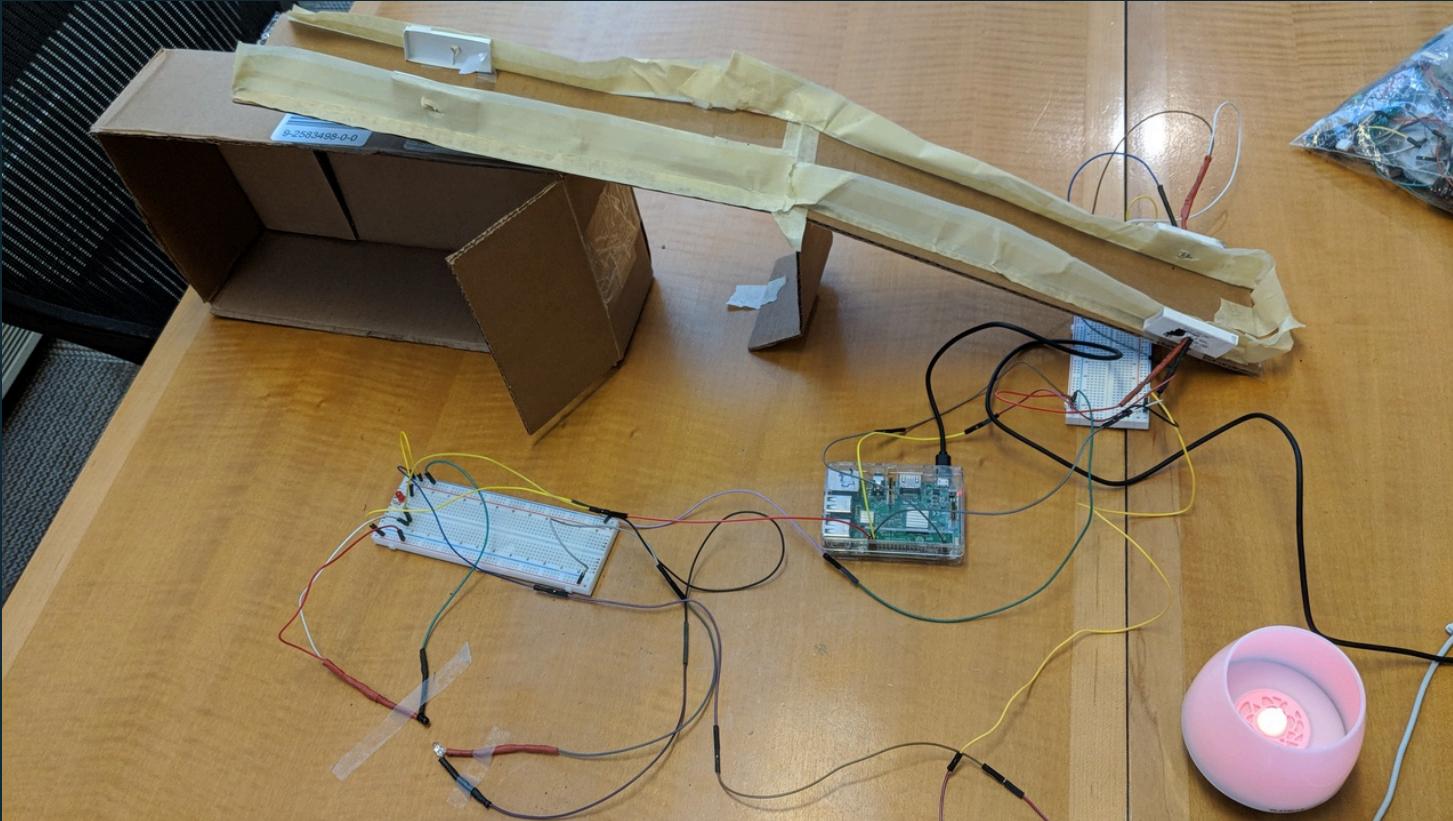
**IBM SPEED**

Think. Create. Win.

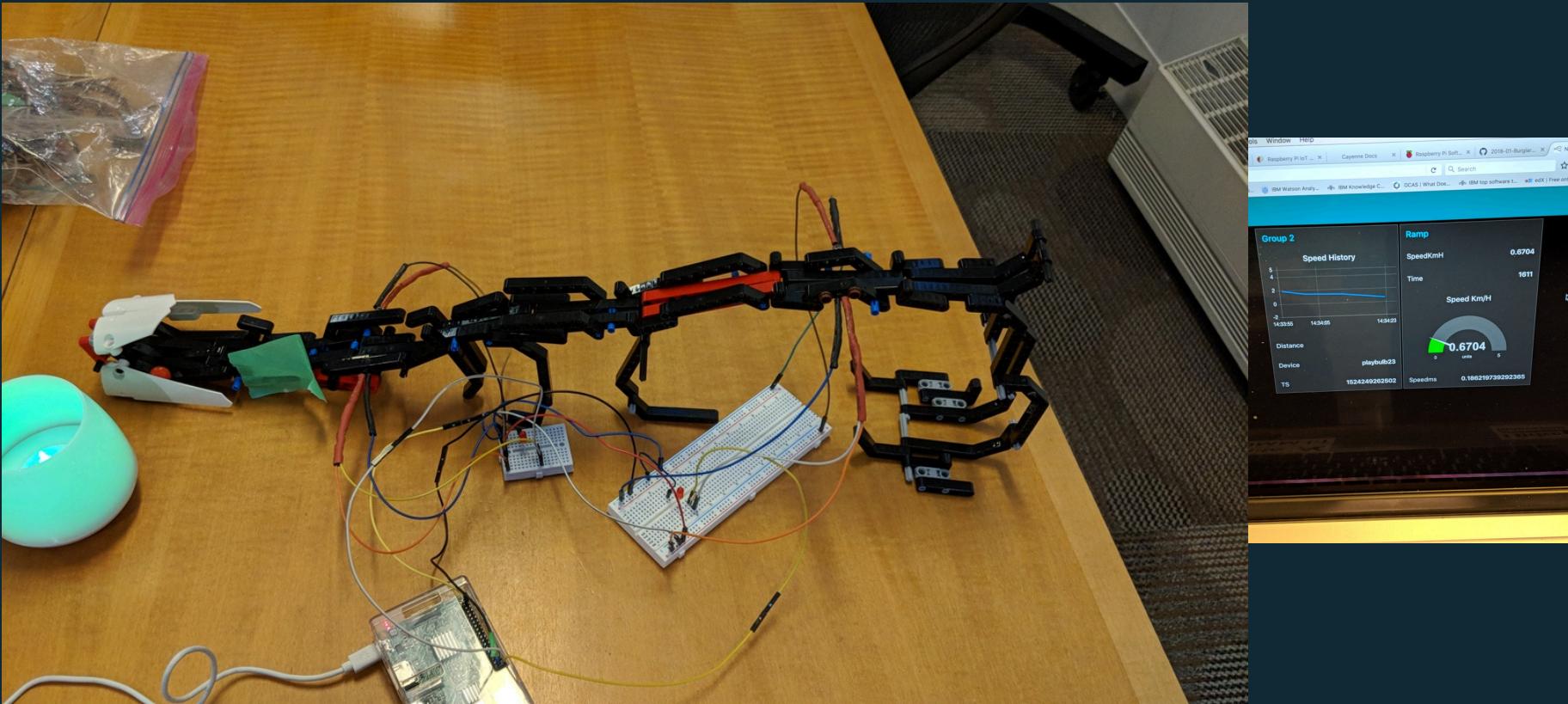
# Measure the Speed of an Object



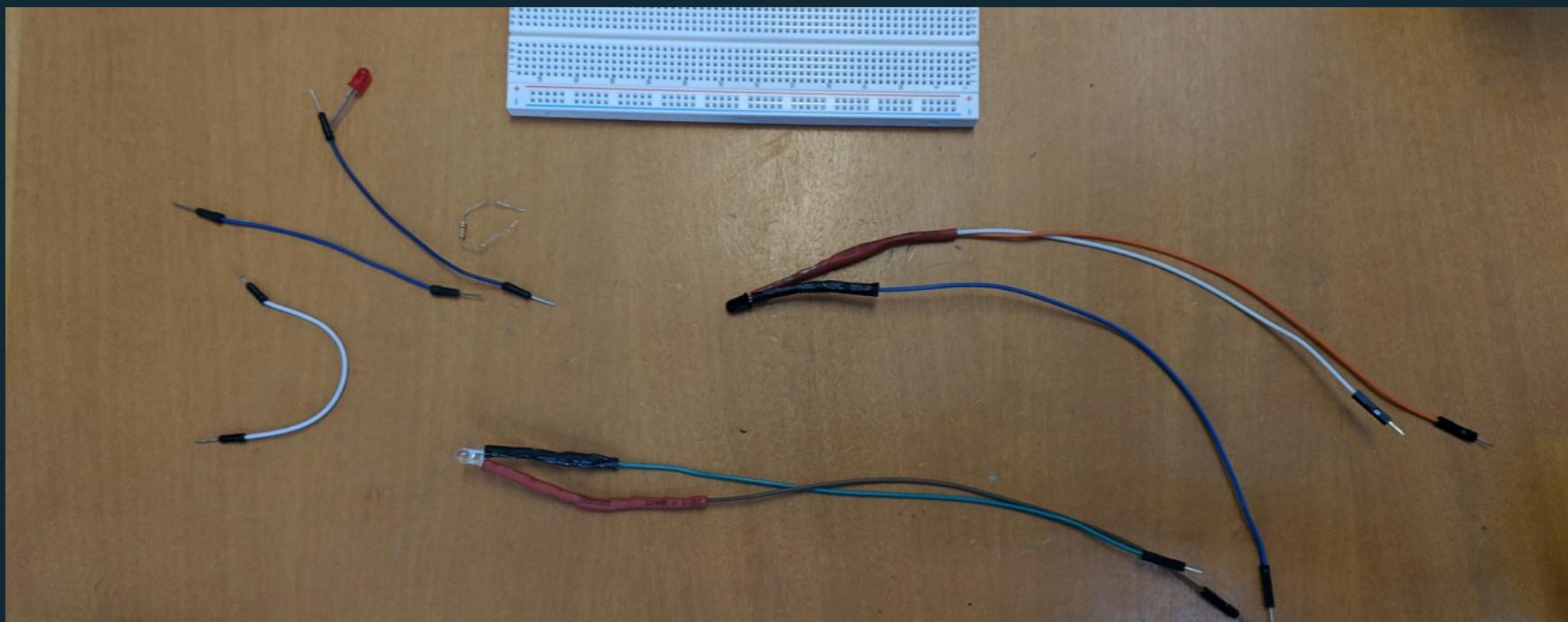
# The Goal



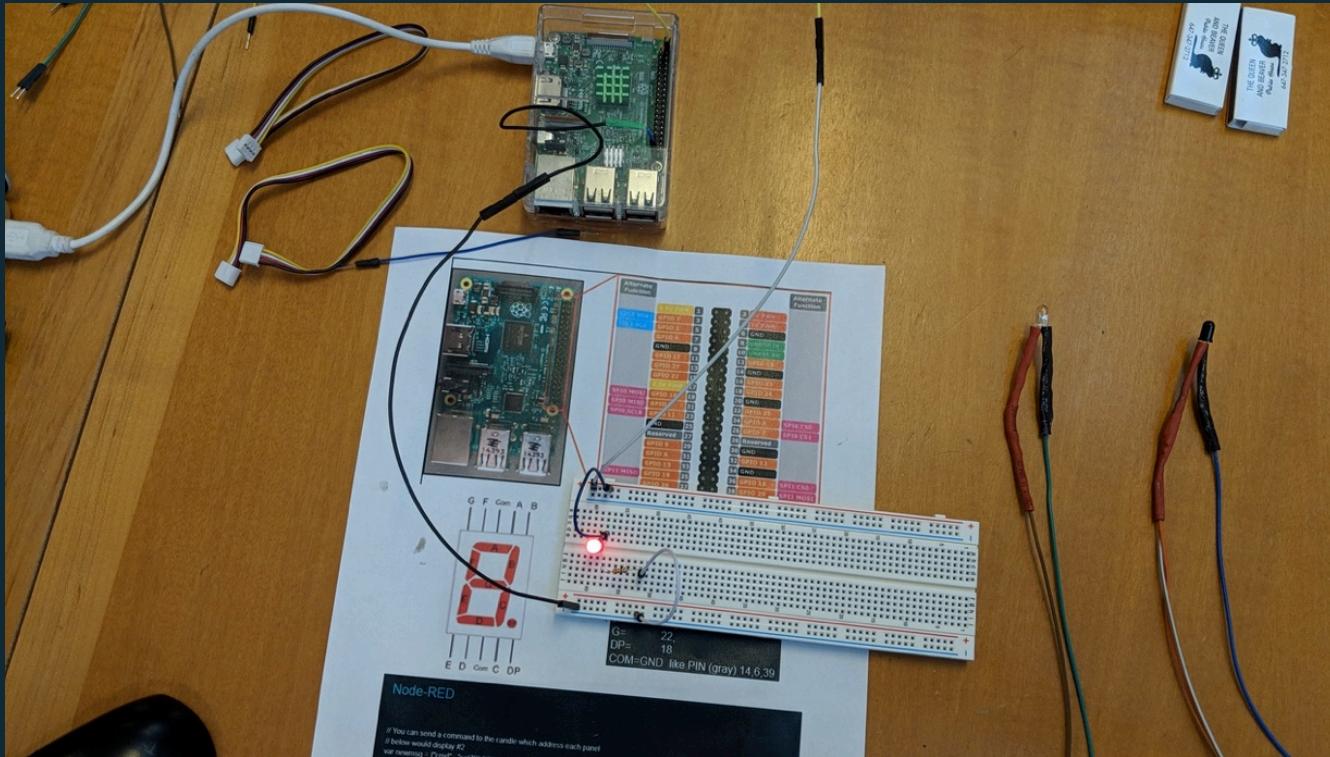
# The Goal



# Materials , LED, Resistor , IR Emitter and Receiver

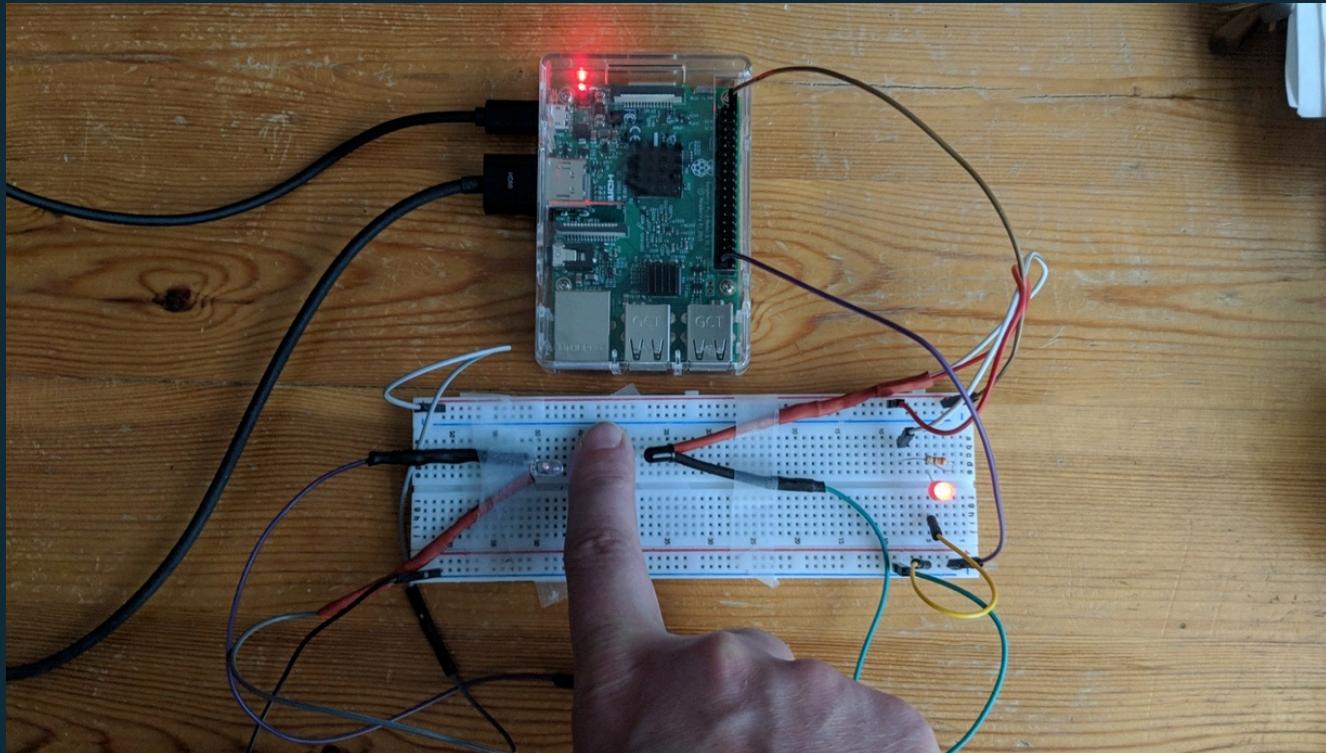


# 1 Step – Setup the LED and the Resistor

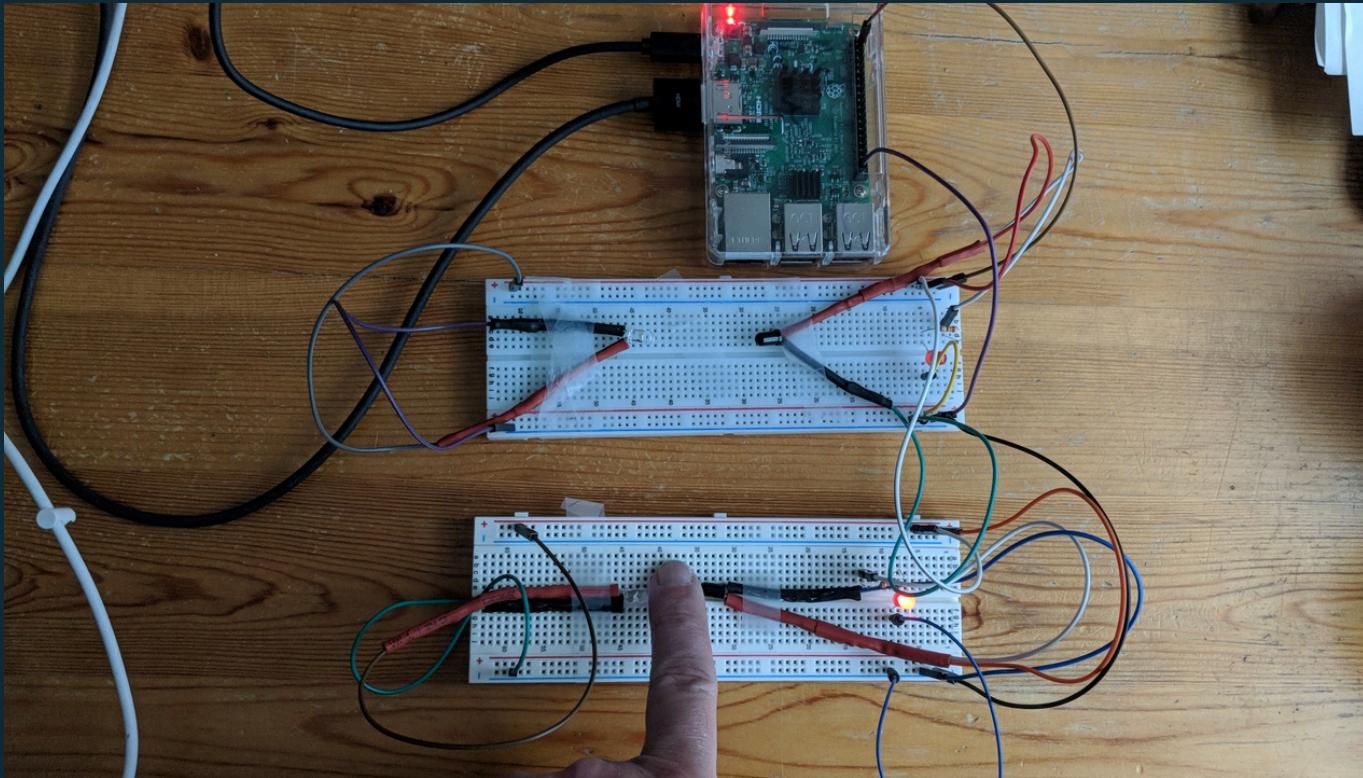


Add the IR Emitter & Receiver and Test it using the LED

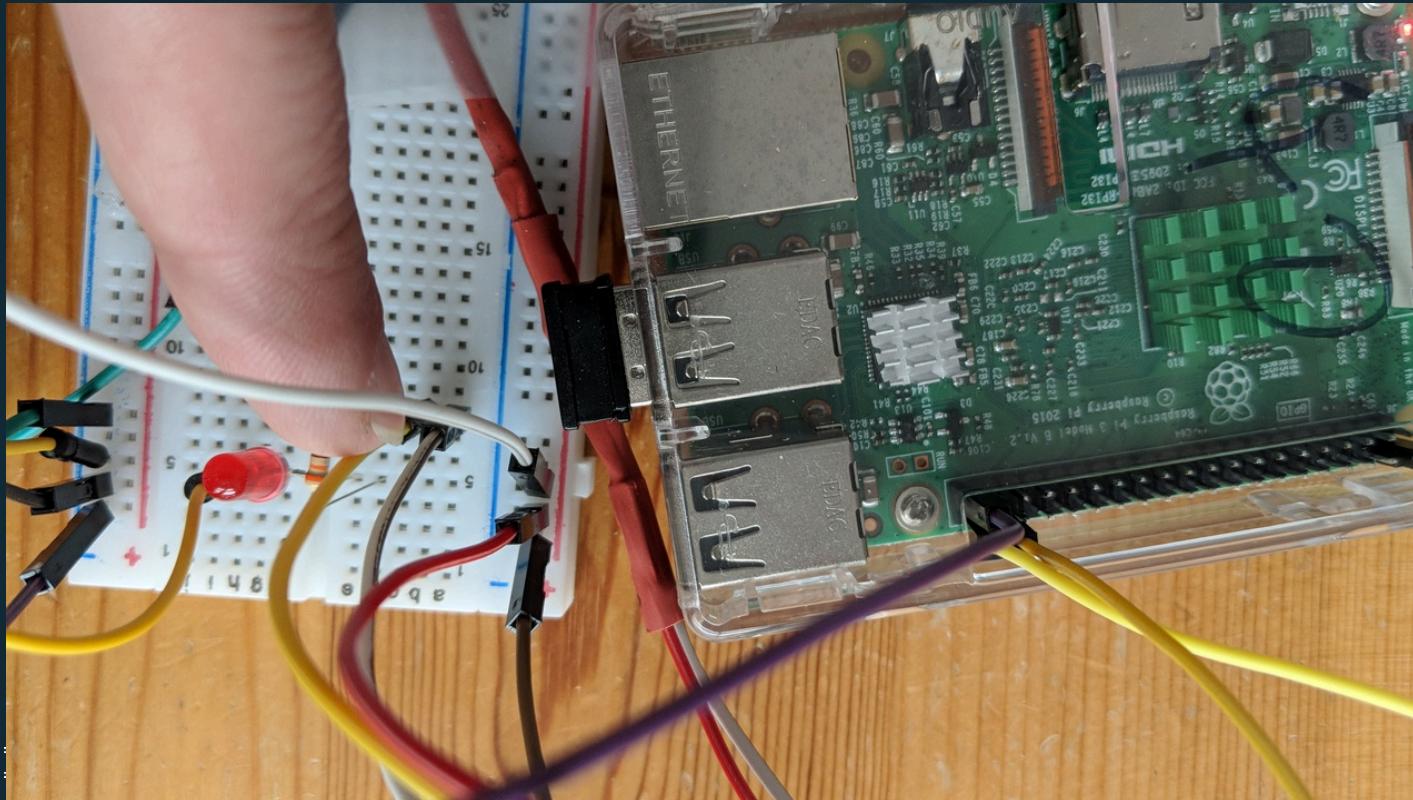
Note: RED = Plus/Power and Black = Ground



Replicate the work and we have 2 sets of IR Breakers



Add the IR pickup (next to the resistor)  
and connect to the PI – bottom 2 right pins on the pin



# Check if you receive IR events in your Node-RED environment

The screenshot shows a Node-RED application window with several nodes and a log viewer.

**Nodes in the Flow:**

- Two blue "IR Events From PI - adjust name" nodes connected to two yellow "switch" nodes.
- A green "Pings" node connected to a green "Touch" node.
- A grey "Test" node connected to a yellow "switch" node.
- Two blue "IR1" nodes connected to two yellow "switch" nodes. One path goes through an orange "SetColorRed" function node and a green "IR1-Broken" node, then to a red "Set IR1" function node. The other path goes through a green "IR1-Broken" node and an orange "SetColorRed" function node.
- Two grey "nestamp" nodes connected to two orange "TS" function nodes.
- Two blue "IR2" nodes connected to two yellow "switch" nodes. One path goes through an orange "Set IR2 - Calculate SPEED - Adjust" function node and a green "IR2-Broken" node, then to an orange "SetColorGreen" function node. The other path goes through a green "IR2-Broken" node and an orange "SetColorGreen" function node.
- An orange "delay 100ms" node connected to a blue "toPiCar" node.
- A blue "toMarkusDashBoard" node connected to a green "Speed" node.
- An orange "Mapping" function node connected to a green "Speed Km/H" node, which then connects to a green "SpeedKmH" node, and finally to a green "Speedms" node.
- A grey "This is the UI (Grey)" node.
- A light blue "Adjust Calculation" node.

**Log Viewer:**

The log viewer displays the following entries:

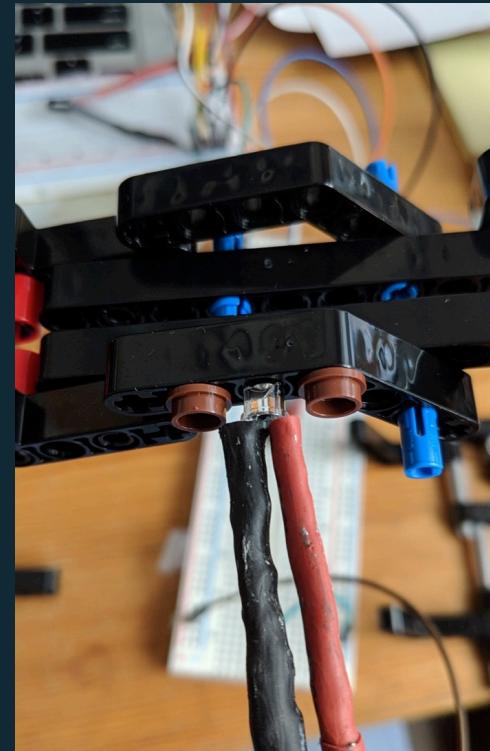
- 4/23/2018, 11:52:39 AM node: Pings  
iot-2/type/playbulb/id/playbulb40/evt/ping/fmt/json : msg.payload : Object  
↳ { event: "ping", value: 173, status: "on", modeno: 255, modes1: 0 ... }
- 4/23/2018, 11:52:41 AM node: IR1-Broken  
iot-2/type/playbulb/id/playbulb40/evt/IR1/fmt/json : msg.payload : Object  
↳ { event: "IR1", value: 1, pin: "40", gpio: "gpio21", tick: 3912370745 ... }
- 4/23/2018, 11:52:41 AM node: Set IR1  
function : (warn)  
" setting time"
- 4/23/2018, 11:52:41 AM node: Pings  
iot-2/type/playbulb/id/playbulb40/evt/IR1/fmt/json : msg.payload : Object  
↳ { cmd: "setcolor", mode: "", speed: "", rr: 255, gg: 0 ... }
- 4/23/2018, 11:52:43 AM node: IR2-Broken  
iot-2/type/playbulb/id/playbulb40/evt/IR2/fmt/json : msg.payload : Object  
↳ { event: "IR2", value: 1, pin: "40", gpio: "gpio21", tick: 3914370120 ... }
- 4/23/2018, 11:52:43 AM node: Set IR2 - Calculate SPEED - Adjust  
function : (warn)  
"Time diff in millisec = 2000"
- 4/23/2018, 11:52:43 AM node: Set IR2 - Calculate SPEED - Adjust  
function : (warn)  
"Distance in CM = 10"
- 4/23/2018, 11:52:43 AM node: Set IR2 - Calculate SPEED - Adjust  
function : (warn)  
"SPEED in kmh = 0.1800"
- 4/23/2018, 11:52:43 AM node: Set IR2 - Calculate SPEED - Adjust

Mount the IR Breakers to the Ramp  
Make sure they are aligned ... use the LED to check

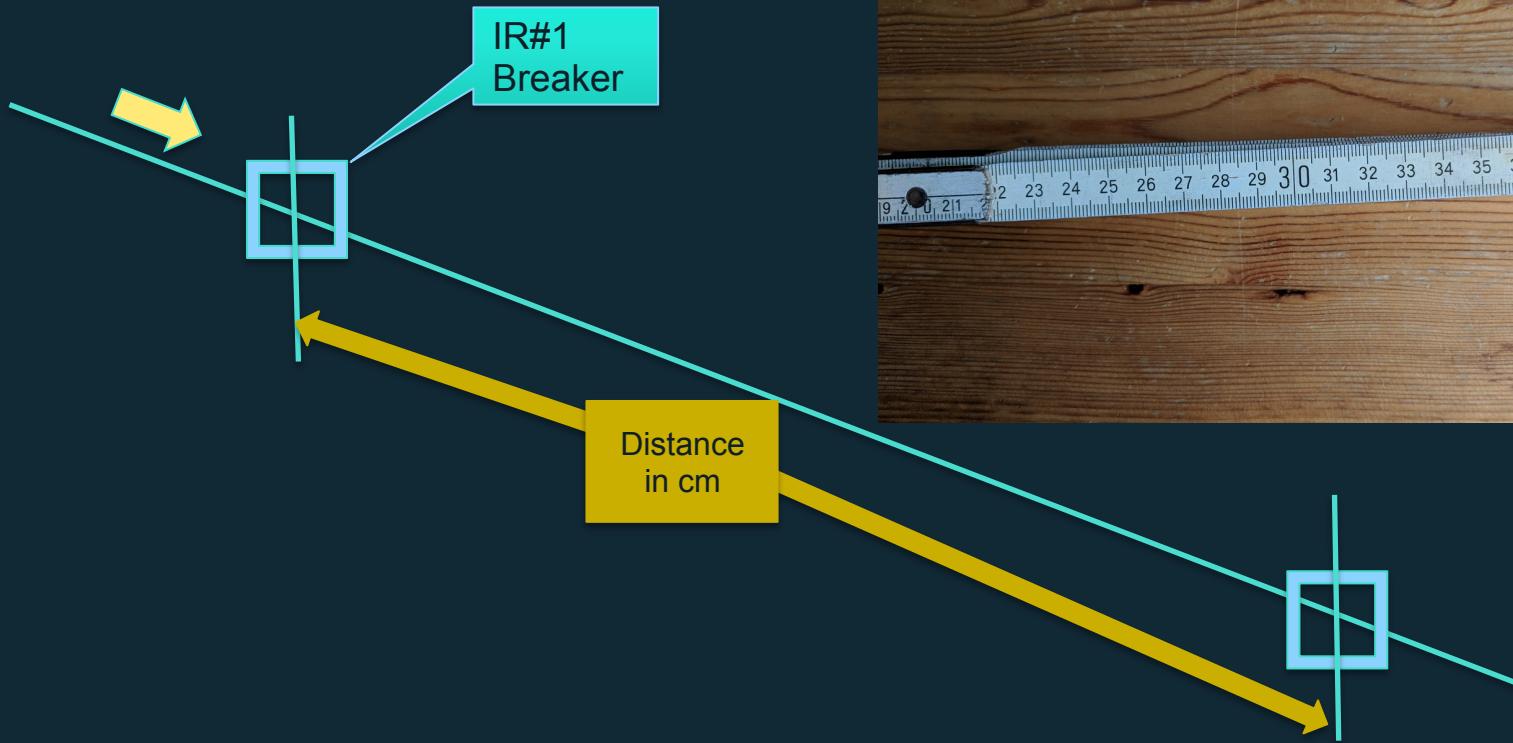
Card Board Version



Lego



# Measure distance between IR Breakers and Adjust code with the length



# Code adjustment the distance

The screenshot shows the Node-RED interface with a flow titled "Blinky04". The left sidebar lists categories: del, input, output, function (selected), social, storage, analysis, advanced, weather, Smarter Process, dashboard, IBM Watson, and Watson Deprecated. The main canvas displays the following flow:

- An "IR Events From Pi" node (connected) has two outputs.
- The first output connects to a "Test" node (grey).
- The second output connects to an "IR1" node (blue, connected).
- The "Test" node has two outputs: one to a "timestamp" node (grey) and one to an "f TS" node (orange).
- The "f TS" node has two outputs: one to an "IR2" node (blue, connected) and one to a "Set IR2 - Calculate" function node (orange).
- The "IR2" node has one output that connects to the "Set IR2 - Calculate" node.
- The "Set IR2 - Calculate" node has one output labeled "Adjust Calculation".

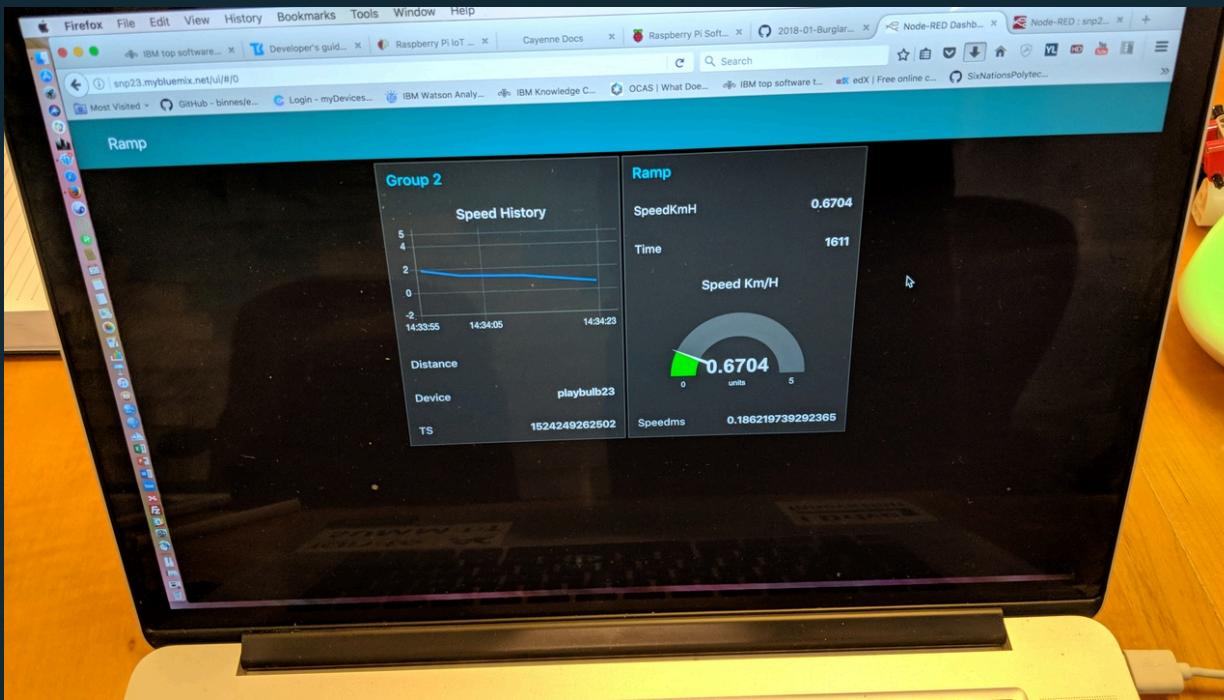
The right panel is an "Edit function node" dialog for the "Set IR2 - Calculate SPEED - Adjust" function. It contains the following code:

```
i 1 iset = global.get("ir1set")
i 2 kph=0
i 3 kmh=0
i 4 if(msg.payload.value == 1 )
i 5 if(iset)
i 6 {
i 7 // node.warn("IR2 set")
i 8 global.set("ir2time",msg.payload.ts)
i 9 global.set("ir1set",false)
i 10
i 11 starttime = global.get("ir1time")
i 12 endtime = global.get("ir2time")
i 13 mytime=endtime-starttime;
i 14 node.warn("Time diff in millisec = "+mytime)
i 15
i 16
i 17 // Speed calc
i 18 //distance
i 19 var ms = 0
i 20
i 21 var distcm = 10 //<<<Adjust distance|
i 22 node.warn("Distance in CM = "+distcm)
i 23 ms = ((distcm/100) / (mytime/1000))
i 24 kph = (ms * 3.6)
i 25
i 26 kmh = (distcm/(mytime/1000)) * 0.036
i 27
```

Below the code, the "Outputs" dropdown is set to 1. A note at the bottom says: "See the Info tab for help writing functions."



Drop a ball on to the Ramp and measure the SPEED -  
Note: Use /UI in the URL





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