

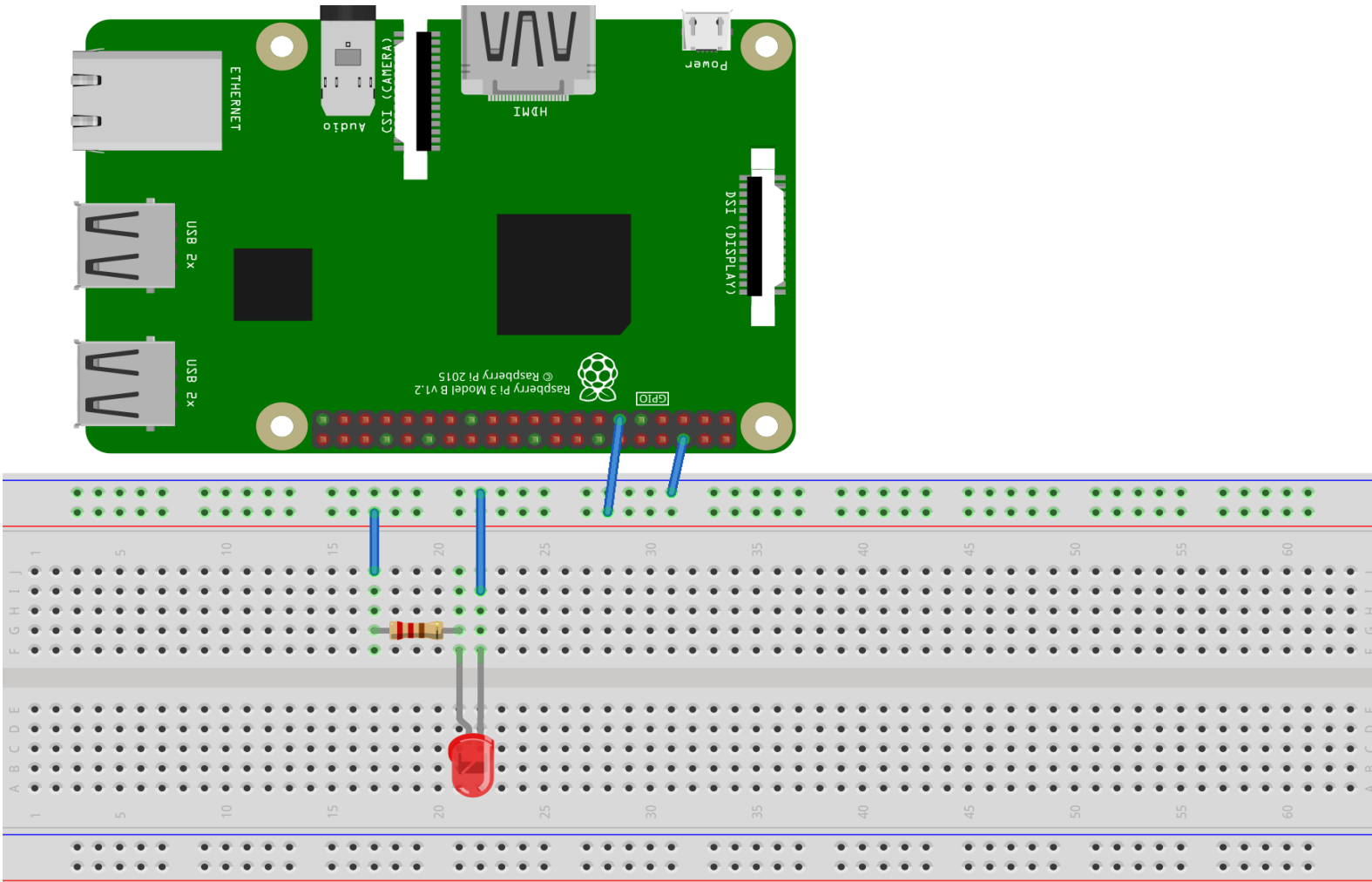
# Node-RED Blinking LEDs

Week 3

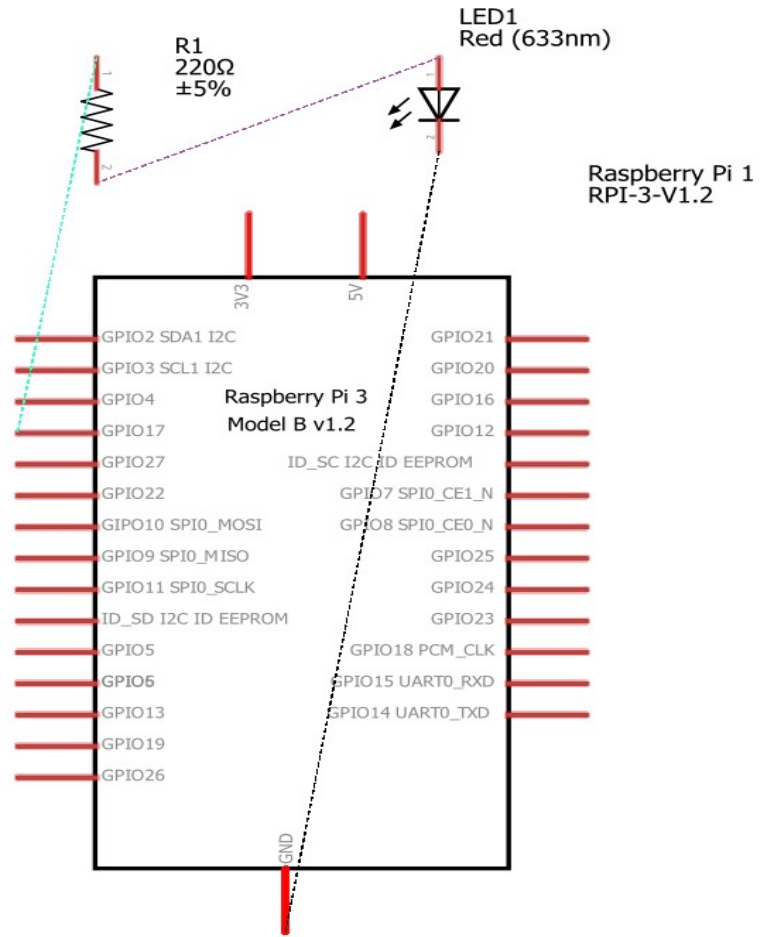
Hackerspace Charlotte

Lisa Waugh

# Wire LED and Resistor























# Wiring Schematic



fritzing

# Raspberry Pi Pin Layout

Raspberry Pi 3 GPIO Header

Pin#	NAME		NAME	Pin#
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I²C)		DC Power 5v	04
05	GPIO03 (SCL1 , I²C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I²C ID EEPROM)		(I²C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

# Start Node-RED

- Click on the Raspberry in top left corner
- Select Programming
- Select Node-RED
- A command window will open and Node-RED console will appear
- Open Firefox or Chromium
- localhost:1880

# Add Inject node



# Configure inject node

Edit inject node

Cancel

Done

✉ Payload

▼ timestamp

📄 Topic

🔄 Repeat

interval ▼

every 1 seconds ▼

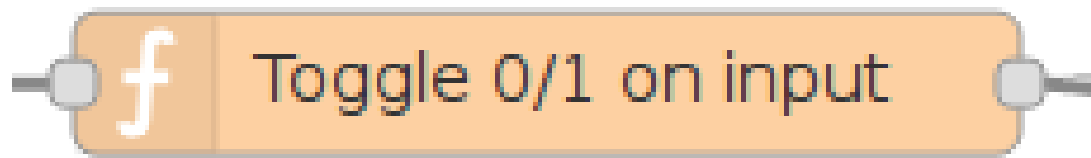
☐ Inject once at start?

🔖 Name

tick every 1 sec


**Note:** "interval between times" and "at a specific time" will use cron.  
See info box for details.

# Add function Node






# Configure function node

 Name

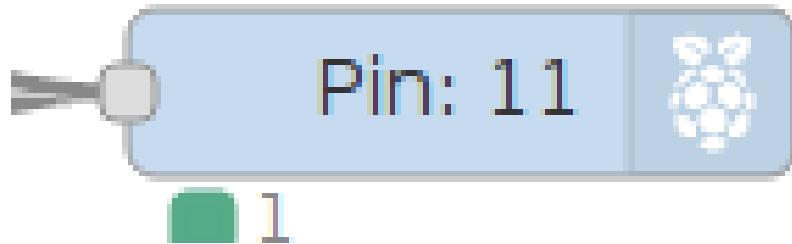
Toggle 0/1 on input



 Function

```
1
2 context.state = context.state || 0;
3
4 (context.state === 0) ? context.state = 1 : context.state = 0;
5 msg.payload = context.state;
6
7 return msg;
```

# Add rpi-gpio out node



# Configure rpi-gpio out node

Edit rpi-gpio out node

Cancel

Done

●

GPIO

Pin 11 - GPIO17

▼

Pi 3 Model B

Type

Digital output

▼

☐

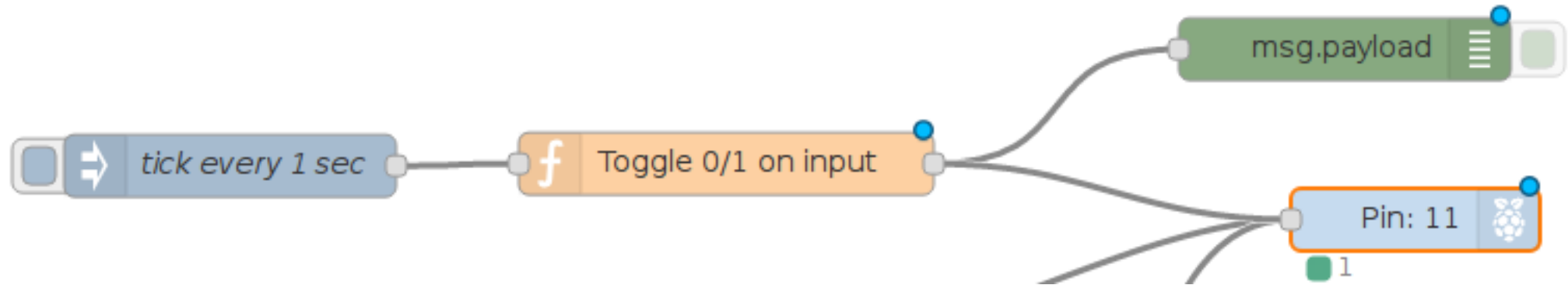
Initialise pin state?

🏷️

Name

Name

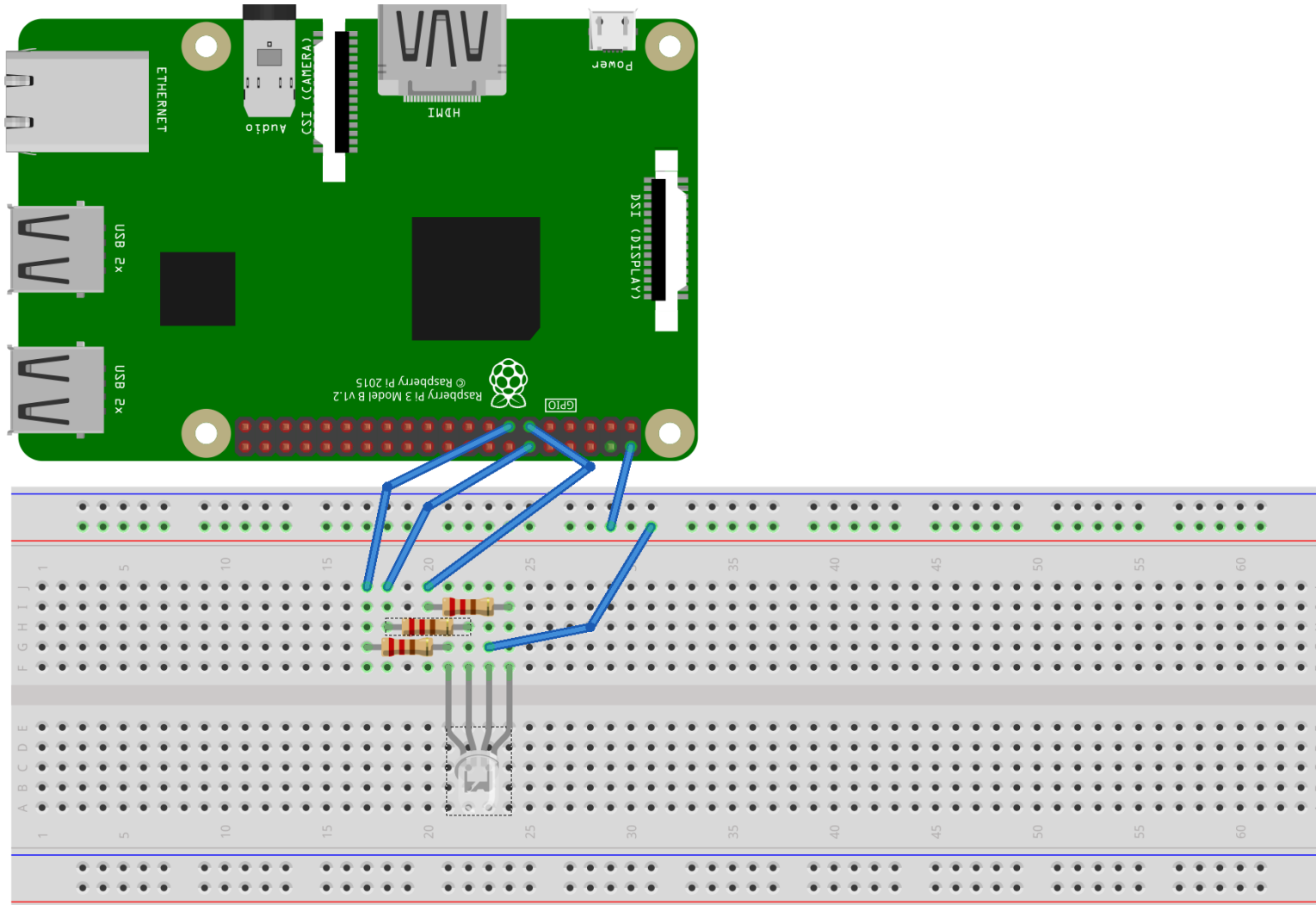
# Add debug node, Connect nodes and Deploy



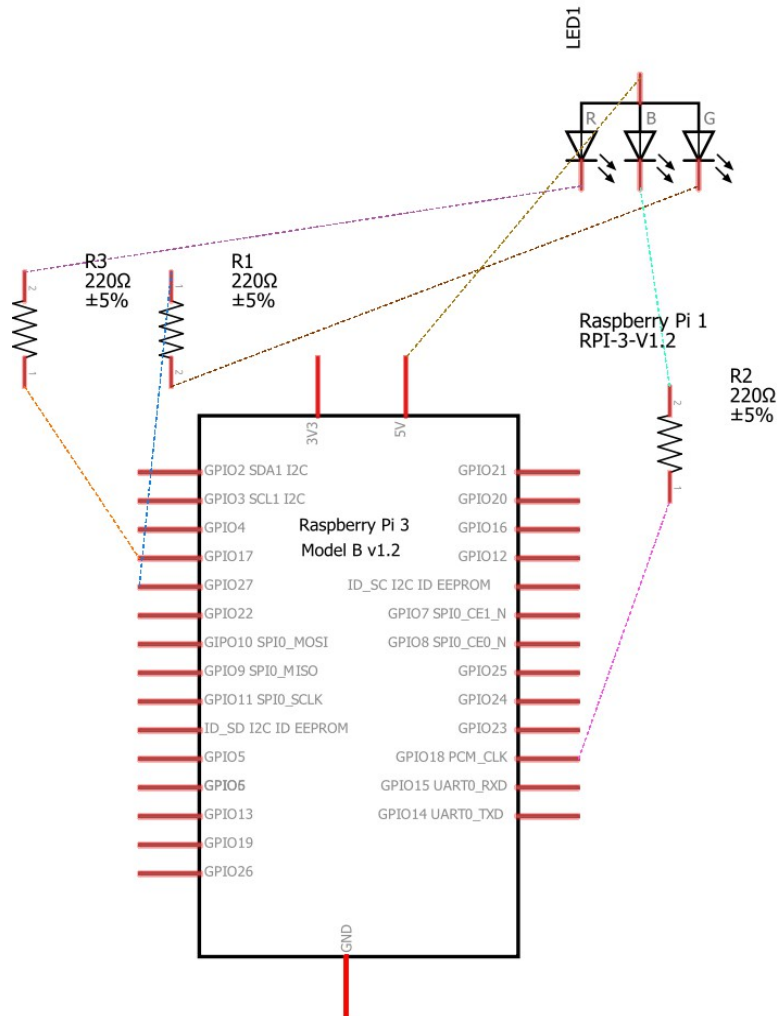
# Wire RGB LED and Resistors

- Remove red led
- Add resistors to pins 12 & 13
- Find flat side of RGB LED
- With flat side of RGB LED on left
  - 1st from left to resistor on Pin 11
  - 2nd from left to 5v (this is the longest leg on RGB LED)
  - 3rd from left to resistor on Pin 12
  - 4th from left to resistor on Pin 13

# Wiring Picture























# Wiring Schematic



fritzing

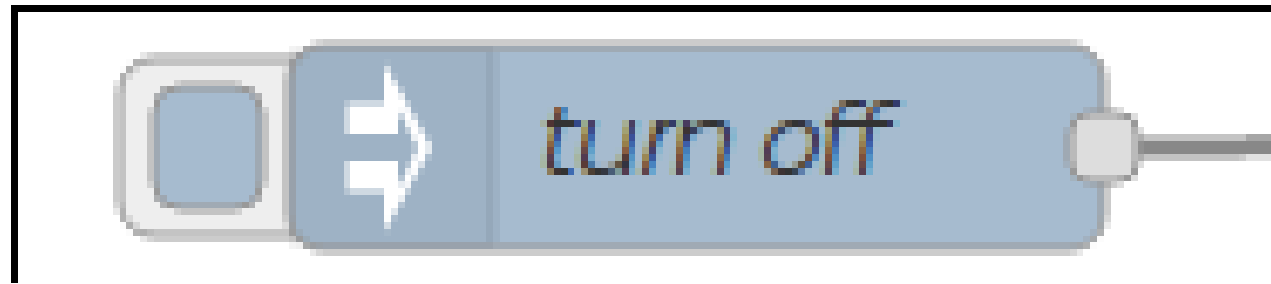
# Raspberry Pi Pin Layout

Raspberry Pi 3 GPIO Header

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29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40



# Add inject node




# Configure inject node


Edit inject node


Cancel

Done

 Payload

▼ timestamp


 Topic

 Repeat

none

▼

☐ Inject once at start?

 Name

turn off

**Note:** "interval between times" and "at a specific time" will use cron.  
See info box for details.


Add function node





# Configure function node – Turn Off

### Edit function node

CancelDone

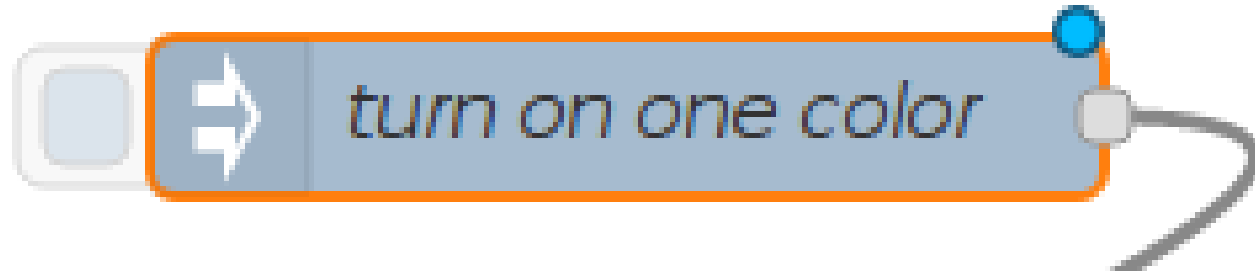
 Name



 Function

```
1 context.state = 1;  
2 msg.payload = context.state;  
3  
4 return msg;
```


# Add inject node




# Configure inject node


### Edit inject node

CancelDone

 Payload


▼ timestamp

 Topic

 Repeat

none ▼

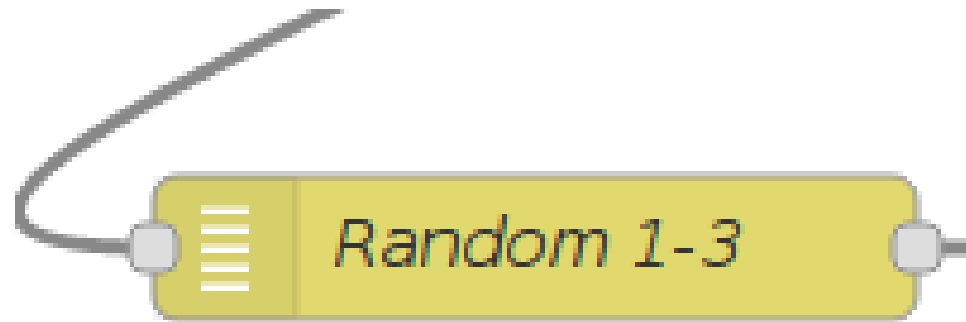
☐ Inject once at start?

 Name

turn on one color

**Note:** "interval between times" and "at a specific time" will use cron.  
See info box for details.


# Add random node




# Configure random node

### Edit random node


CancelDone

 Generate


a whole number - integer ▼

 From

1

 To

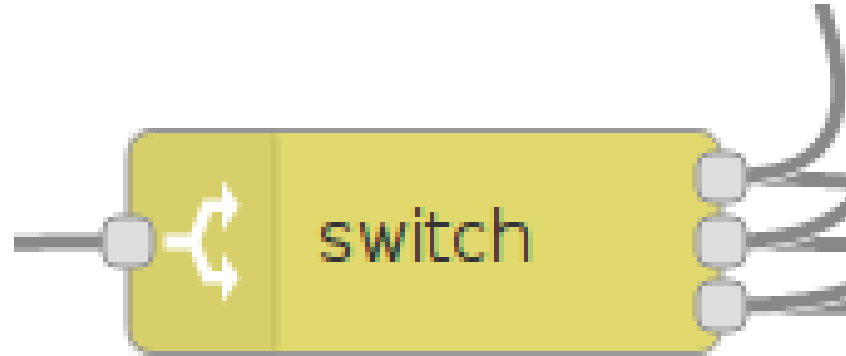
3

 Name

Random 1-3



# Add switch node



# Configure switch node

Edit switch node

Cancel

Done

Name

Name

Property

▼

msg.payload

≡

==

▼

▼

0<sub>9</sub>

1

→ 1

✕

≡

==

▼

▼

0<sub>9</sub>

2

→ 2

✕

≡

==

▼

▼

0<sub>9</sub>

3

→ 3

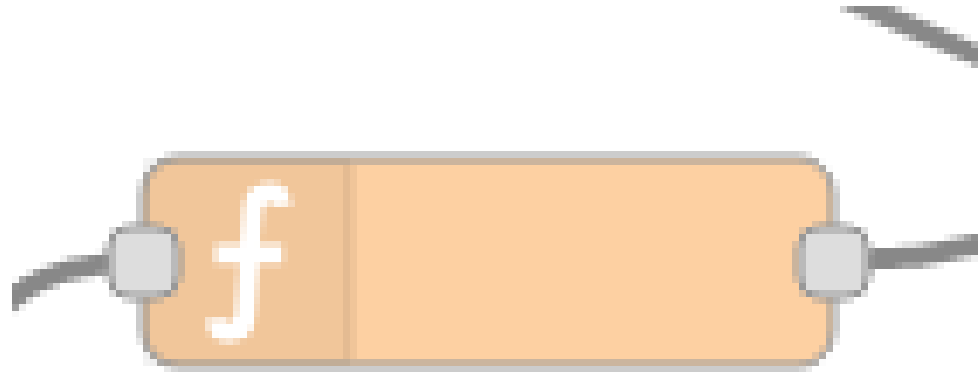
✕

+ add

stopping after first match

▼

Add 3 function nodes





# Configure All 3 function nodes the same

Edit function node

Cancel

Done

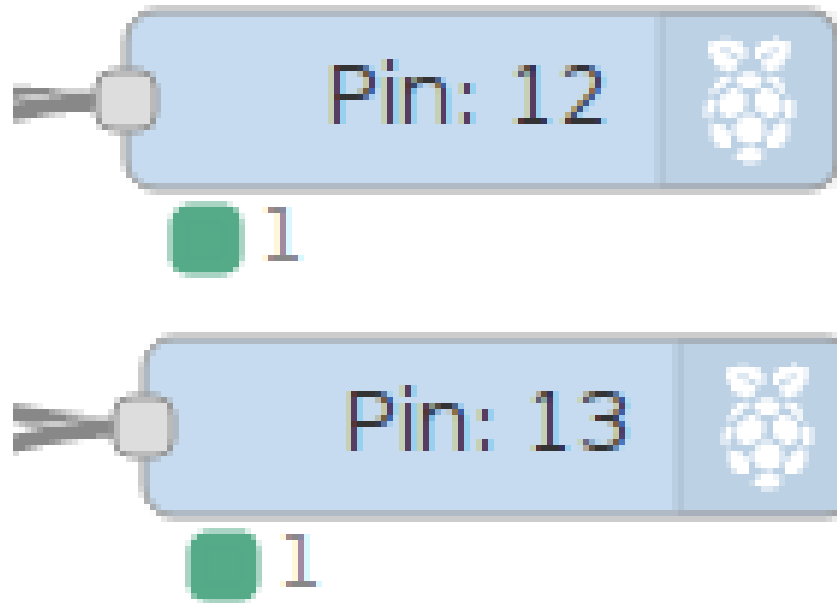
 Name



 Function

```
1 context.state = 0;  
2 msg.payload = context.state;  
3  
4 return msg;
```

Add 2 more rpi-gpio out node



# Configure rpi-gpio out node 2

Edit rpi-gpio out node

Cancel

Done

GPIO

Pin 12 - GPIO18

▼

Pi 3 Model B

Type

Digital output

▼

☐

Initialise pin state?

Name

Name

**Pins in Use:** 7,11,12,13

Tip: For digital output - input must be 0 or 1.

# Configure rpi-gpio out node 3

### Edit rpi-gpio out node

CancelDone

☒ GPIO

Pin 13 - GPIO27 ▼

Pi 3 Model B

Type

Digital output ▼

☐ Initialise pin state?

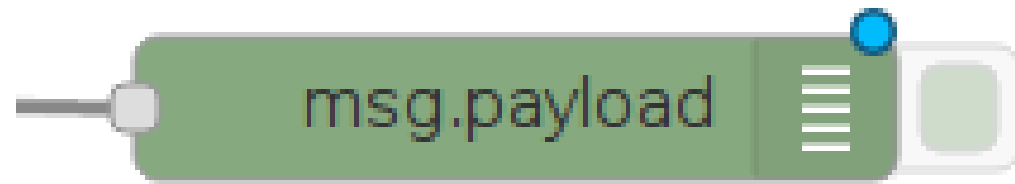
Name

Name

**Pins in Use:** 7,11,12,13

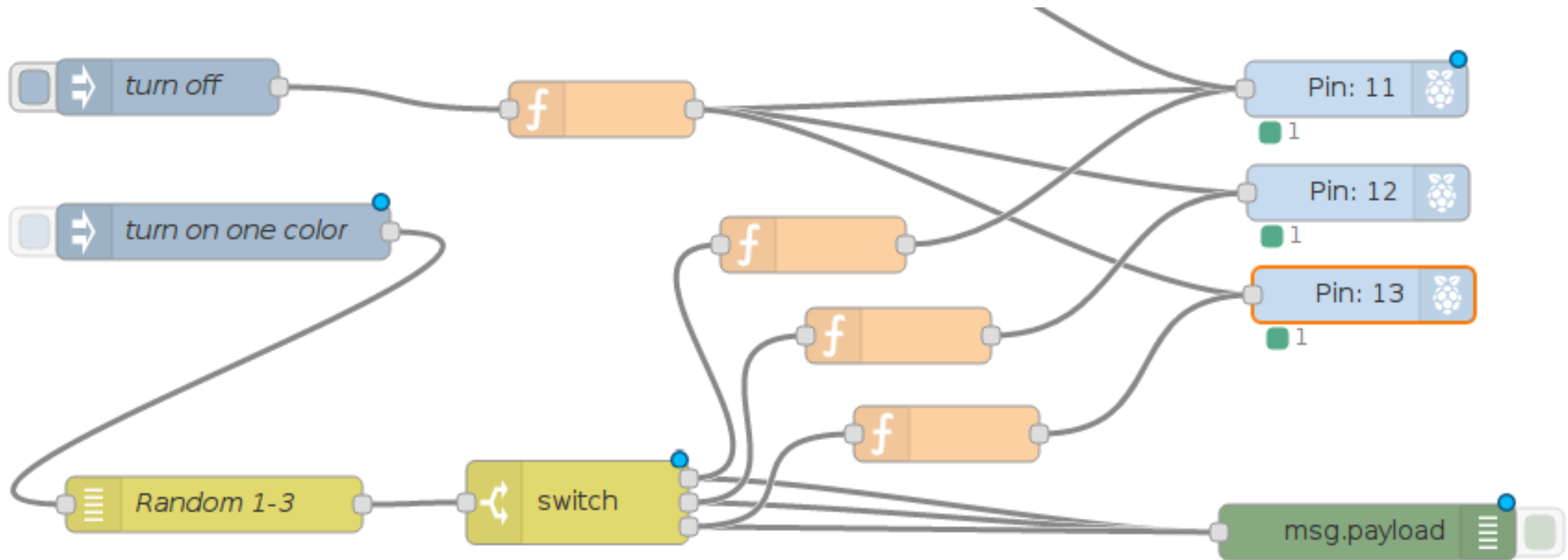
Tip: For digital output - input must be 0 or 1.

# Add debug node





# Connect nodes and Deploy



# Challenges

- Add additional colors
- Automate color changes

