

物聯網實務 HW4

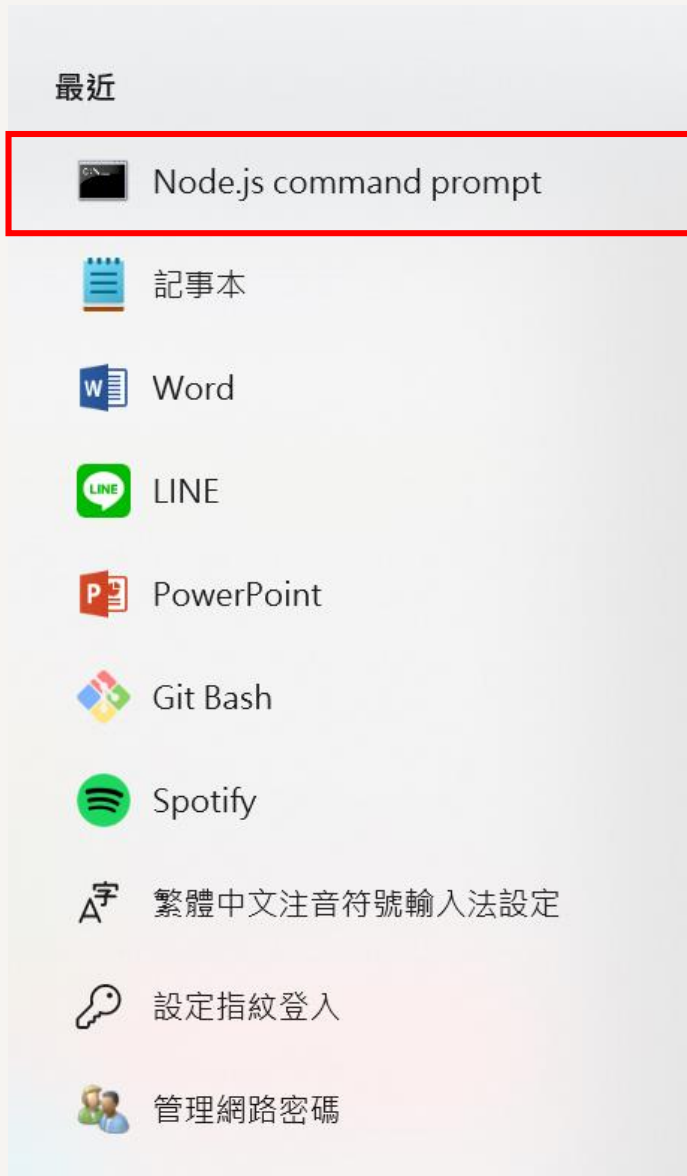
電機碩一 11278008 林佳慧

日期:2023/10/04

Exercise 4-1

Test `Object.keys()` in Node-RED

Open and run Node-RED



```
C:\Users\user>node-red  
4 Oct 14:28:00 - [info]
```

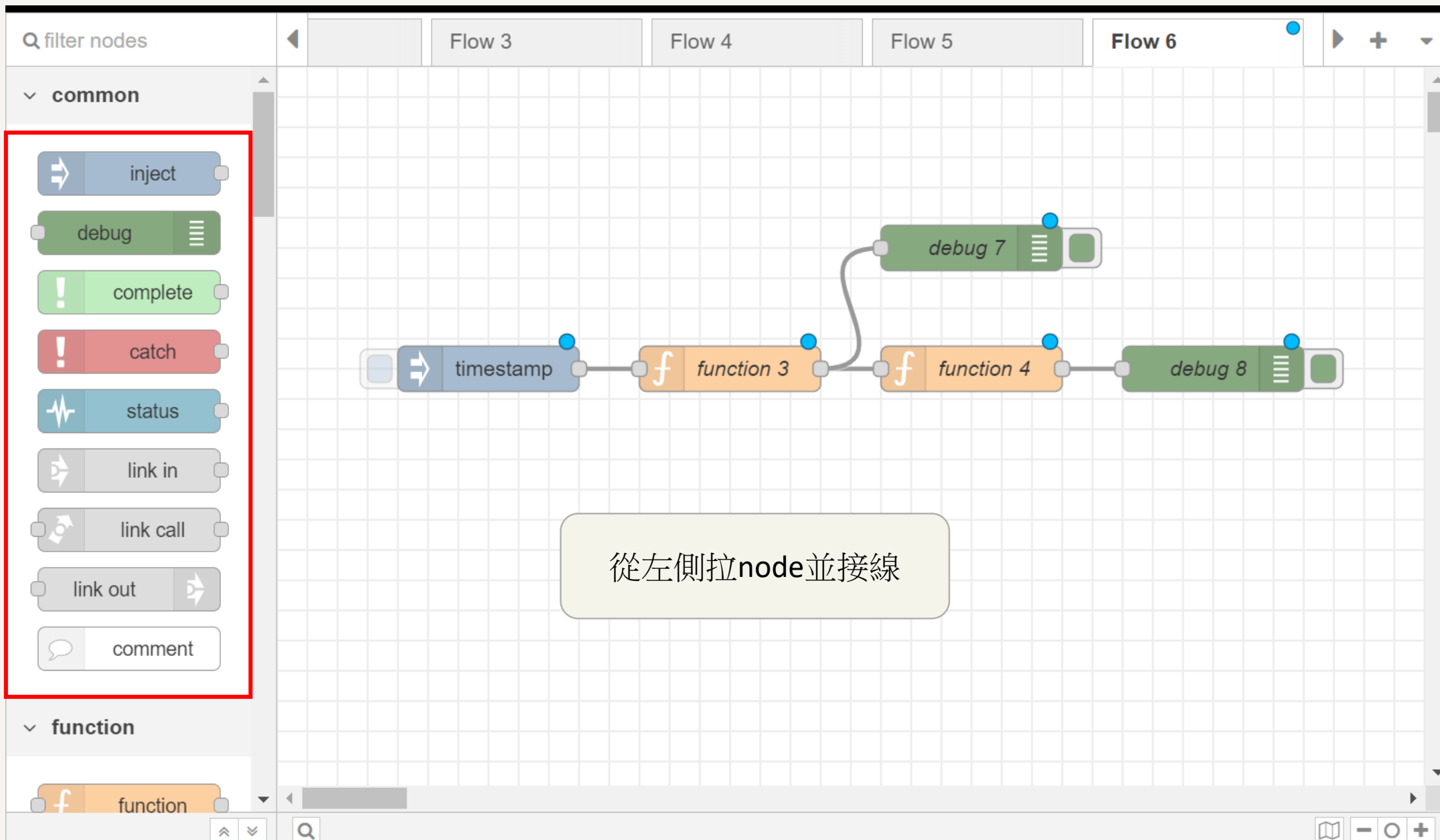
```
Welcome to Node-RED  
=====
```

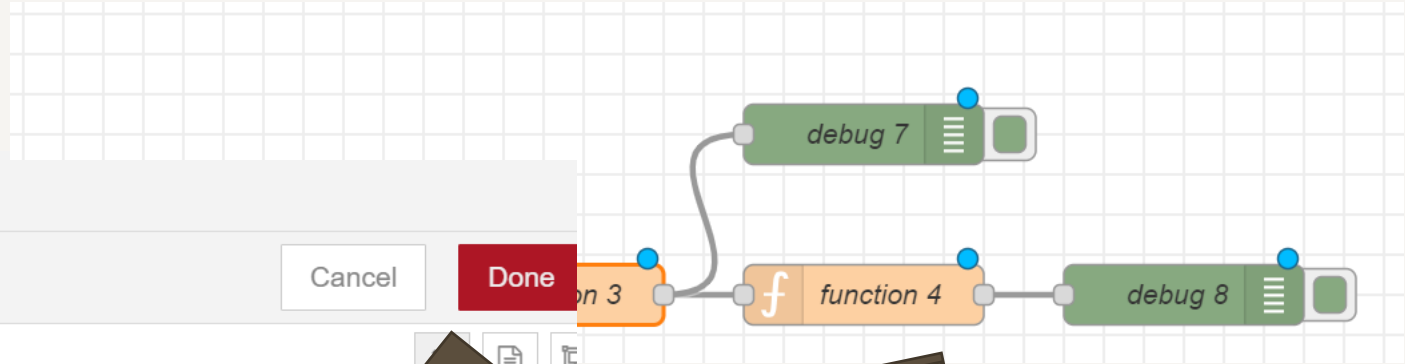
```
-----  
Your flow credentials file is encrypted using a system-generated key.  
  
If the system-generated key is lost for any reason, your credentials  
file will not be recoverable, you will have to delete it and re-enter  
your credentials.
```

```
You should set your own key using the 'credentialSecret' option in  
your settings file. Node-RED will then re-encrypt your credentials  
file using your chosen key the next time you deploy a change.  
-----
```

```
4 Oct 14:28:02 - [info] Server now running at http://127.0.0.1:1880/  
4 Oct 14:28:02 - [info] Starting flows  
4 Oct 14:28:02 - [info] Started flows
```

Ctrl + 滑鼠左鍵開啟網頁





Edit function node

Delete

Cancel

Done

⚙️ Properties

📄 Name

function 3

⚙️ Setup

On Start

On Message

On Stop

1

msg.payload={firstName:"John",lastName: "Doe",age: 50,eyeColor:

2

3

return msg;

📄

○ Enabled

Edit function node

Delete

Cancel

Done

⚙️ Properties

📄 Name

function 4

⚙️ Setup

On Start

On Message

On Stop

1

const person=msg.payload;

2

const keys = Object.keys(person);

3

msg.payload=keys;

4

return msg;

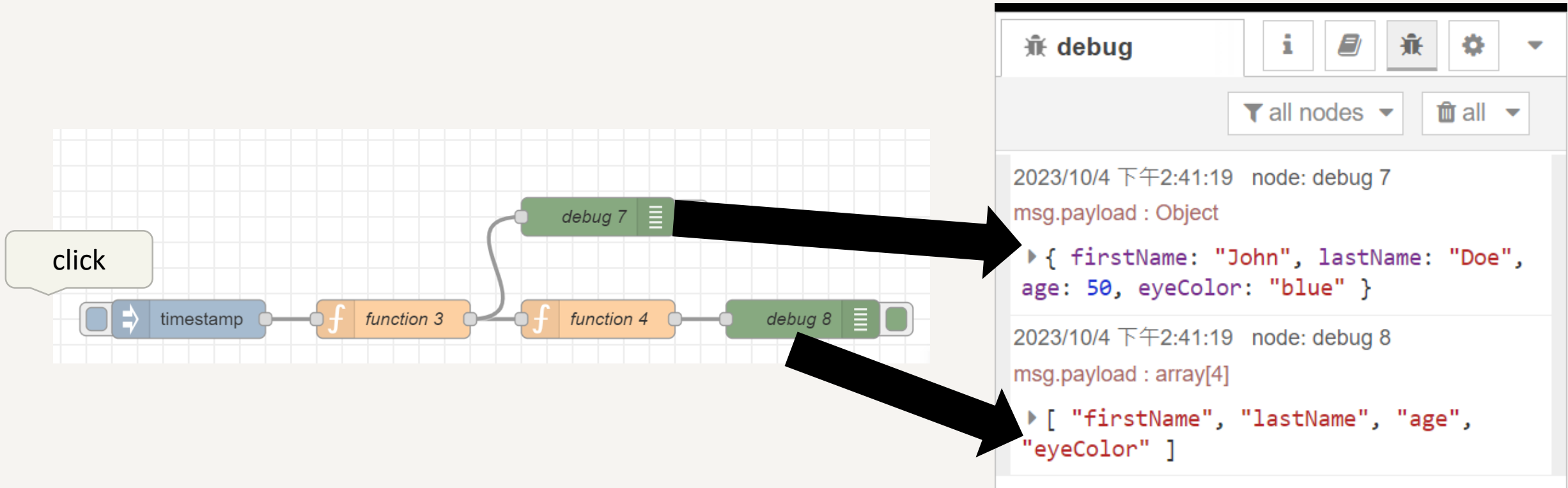
📄

○ Enabled

🚀 Deploy

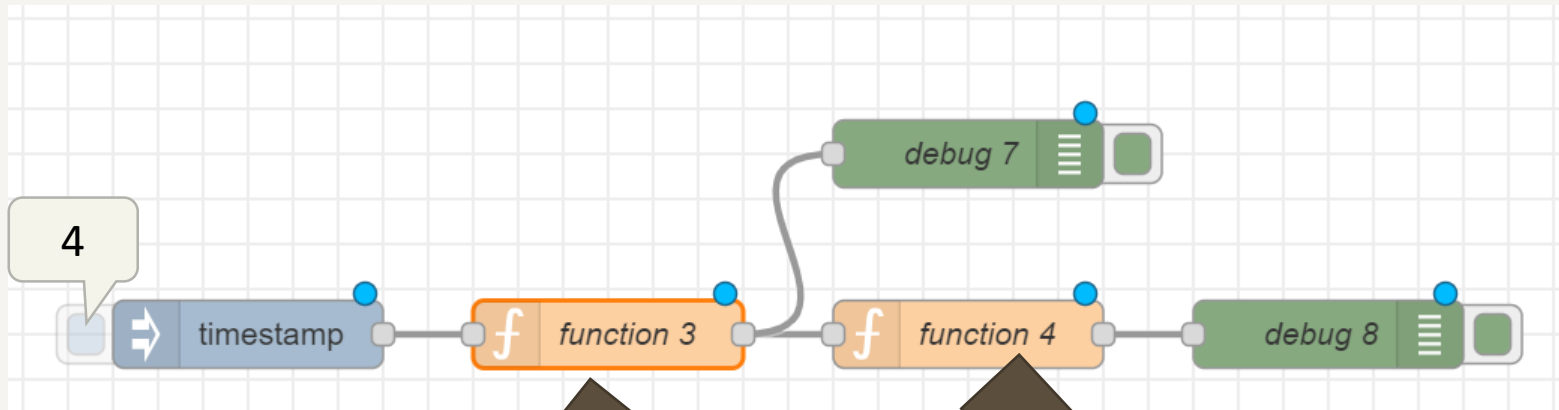
3

Trigger



Exercise 4-2

Test `Object.values()` in Node-RED



Deploy

3

Edit function node

Delete

Cancel

Done

1

Properties

Name function 3

Setup

On Start

On Message

On Stop

```
1 msg.payload={firstName:"John",lastName: "Doe",age: 50,eyeColor:
2
3 return msg;
```

Edit function node

Delete

Cancel

Done

Properties

Name function 4

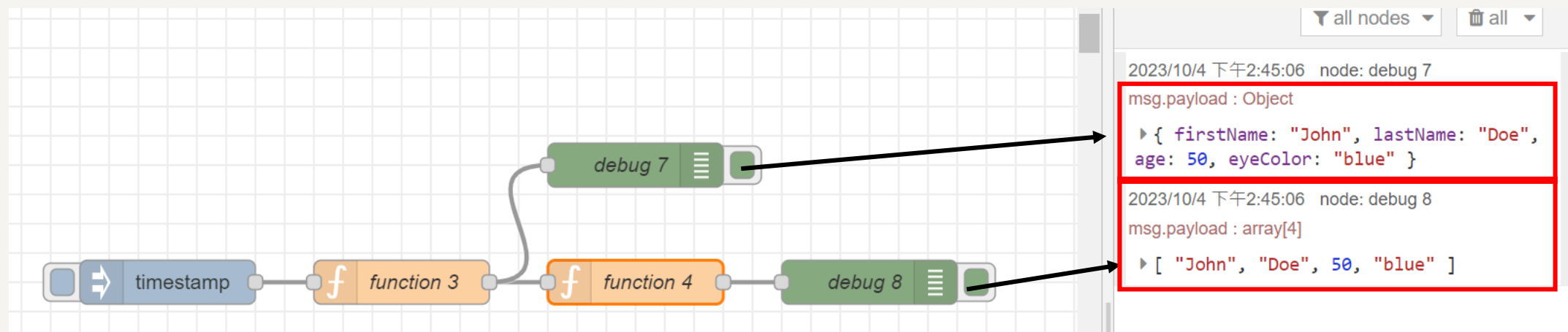
Setup

On Start

On Message

On Stop

```
1 const person=msg.payload;
2 const keys = Object.values(person);
3 msg.payload=keys;
4 return msg;
```

Object

```
{  
  firstName: "John",  
  lastName: "Doe",  
  age: 50,  
  eyeColor: "blue"  
}
```



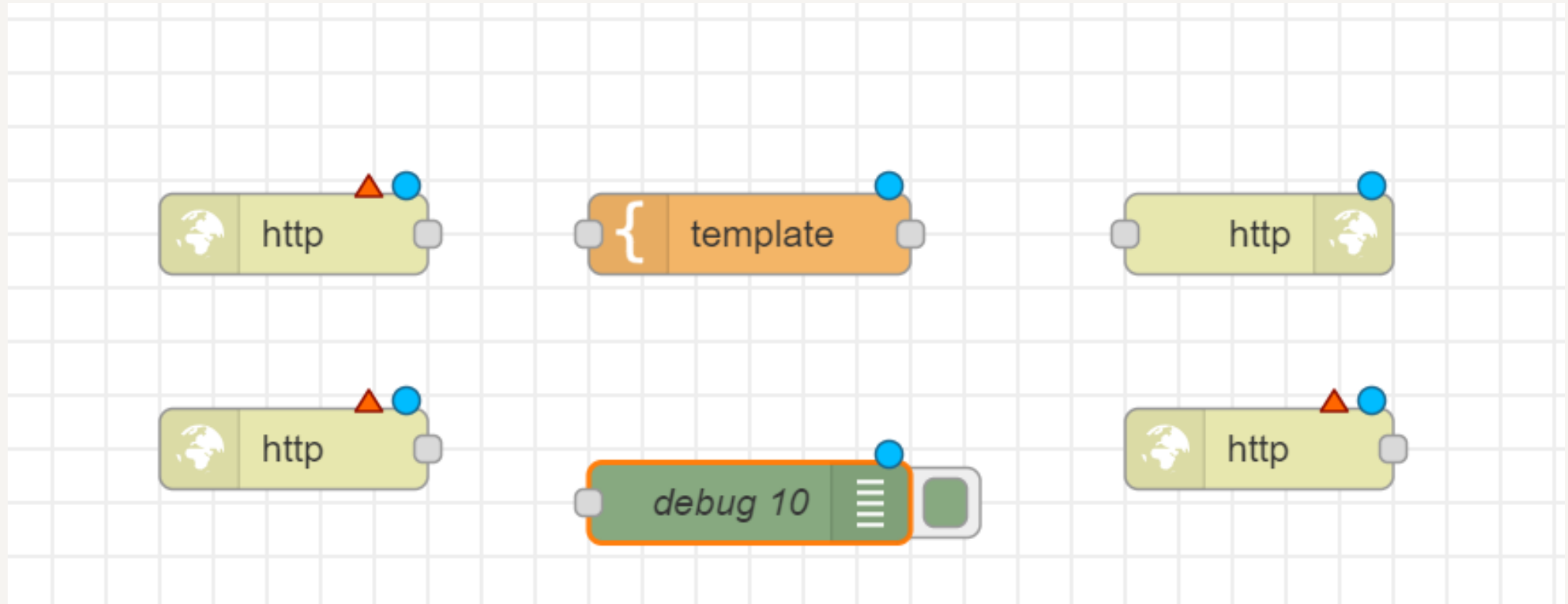
`Object.values(Object)`

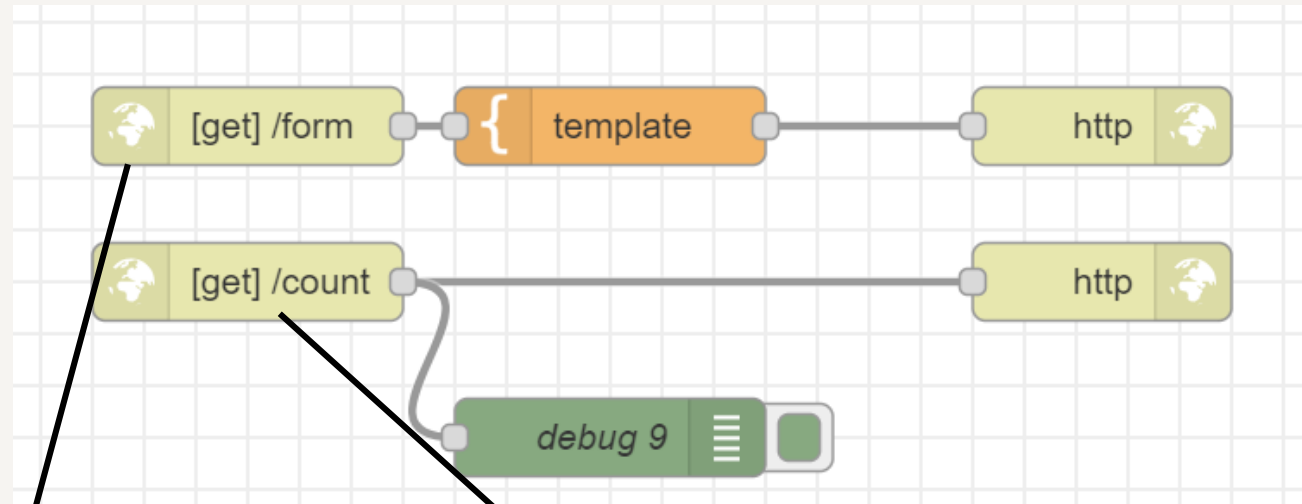


`["John", "Doe", 50, "blue"]`

Exercise 4-3

Design of a voting system





Edit http in node

Delete Cancel Done

Properties

Method GET **/form**

URL **/form**

Name Name

Edit http in node

Delete Cancel Done

Properties

Method GET **/count**

URL **/count**

Name Name

HTML Block & Inline
HTML Classes
HTML Id
HTML Iframes
HTML JavaScript
HTML File Paths
HTML Head
HTML Layout
HTML Responsive
HTML Computercode
HTML Semantics
HTML Style Guide
HTML Entities
HTML Symbols
HTML Emojis
HTML Charset
HTML URL Encode
HTML vs. XHTML
HTML Forms
HTML Form Attributes
HTML Form Elements

Radio Buttons

The `<input type="radio">` defines a radio button.

Radio buttons let a user select ONE of a limited number of choices.

Example

A form with radio buttons:

```
<p>Choose your favorite Web language:</p>

<form>
  <input type="radio" id="html" name="fav_language" value="HTML">
  <label for="html">HTML</label><br>
  <input type="radio" id="css" name="fav_language" value="CSS">
  <label for="css">CSS</label><br>
  <input type="radio" id="javascript" name="fav_language" value="JavaScript">
  <label for="javascript">JavaScript</label>
</form>
```

[Try it Yourself »](#)

HTML

CSS

JAVASCRIPT

SQL

PYTHON

JAVA

PHP

HOW TO

W3

HTML Block & Inline

HTML Classes

HTML Id

HTML Iframes

HTML JavaScript

HTML File Paths

HTML Head

HTML Layout

HTML Responsive

HTML Computercode

HTML Semantics

HTML Style Guide

HTML Entities

HTML Symbols

HTML Emojis

HTML Charset

HTML URL Encode

HTML vs. XHTML

HTML Forms

HTML Forms

HTML Forms

[< Previous](#)

An HTML form is used to collect user input. The u

Example

First name:

Last name:

[Try it Yourself »](#)

利用前一頁網頁改寫成自己的投票選單



Run >

```
<!DOCTYPE html>
<html>
<body>

<h2>Choose your favorite Candidate:</h2>

<p></p>

<form action="/count">
  <input type="radio" id="侯友宜" name="fav_language" value="侯友宜">
  <label for="html">侯友宜</label><br>
  <input type="radio" id="米可白" name="fav_language" value="米可白">
  <label for="css">米可白</label><br>
  <input type="radio" id="皮克斯" name="fav_language" value="皮克斯">
  <label for="javascript">皮克斯</label><br><br>
  <input type="submit" value="Submit">
</form>

</body>
</html>
```

copy

Choose your favorite Candidate:

- ☐ 侯友宜
- ☐ 米可白
- ☐ 皮克斯

Submit



Edit template node

Delete

Cancel

Done

Properties

Name

Name



Property

msg. payload

Template

Syntax Highlight: mustache



```
10 <input type="radio" id="侯友宜" name="fav_languag
11 <label for="html">侯友宜</label><br>
12 <input type="radio" id="米可白" name="fav_languag
13 <label for="css">米可白</label><br>
14 <input type="radio" id="米克斯" name="fav_languag
15 <label for="javascript">米克斯</label><br><br>
16 <input type="submit" value="Submit">
17 </form>
18
```

</> Format

Mustache template



Paste

Output as

Plain text



Enabled

← → ↻ 🏠 ⓘ 127.0.0.1:1880/#flow/fc782256abe66868



127.0.0.1:1880/form

Node-RED

filter nodes

common

inject

debug

complete

catch

status

link in

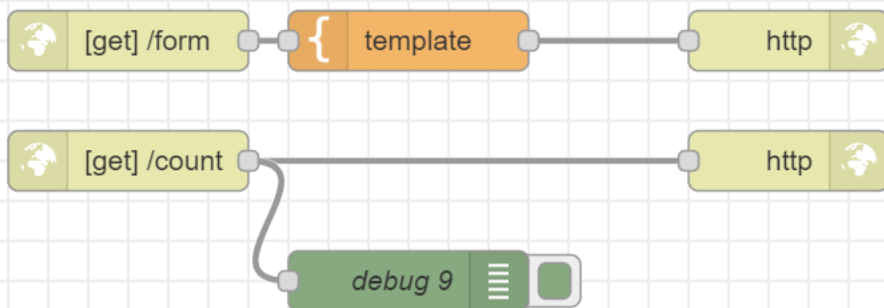
link call

link out

Flow 4

Flow 5

Flow 6



另開分頁並將網址改寫

127.0.0.1:1880/form

Choose your favorite Candidate:

- ☐ 侯友宜
- ☐ 米可白
- ☐ 米克斯

Submit



Choose your favorite Candidate:

- ☐ 侯友宜
- ☒ 米可白
- ☐ 米克斯

Submit



127.0.0.1:1880/count?fav_can=米可白

{"fav_can": "米可白"}

Showing your choice

debug



all nodes

all

2023/10/4 下午4:19:11 node: debug 9

msg.payload : Object

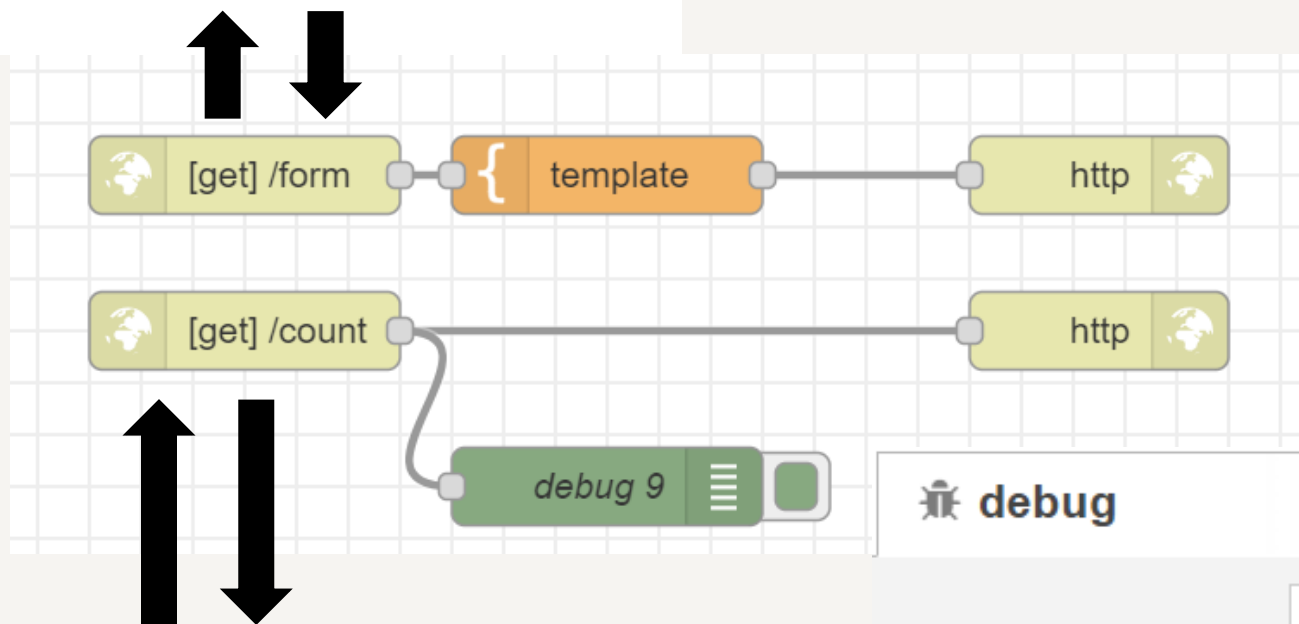
{ fav_can: "米可白" }

debug

Choose your favorite Candidate:

- ☐ 侯友宜
- ☐ 米可白
- ☐ 米克斯

Submit



debug



all nodes ▼

all ▼

2023/10/4 下午4:19:11 node: debug 9

msg.payload : Object

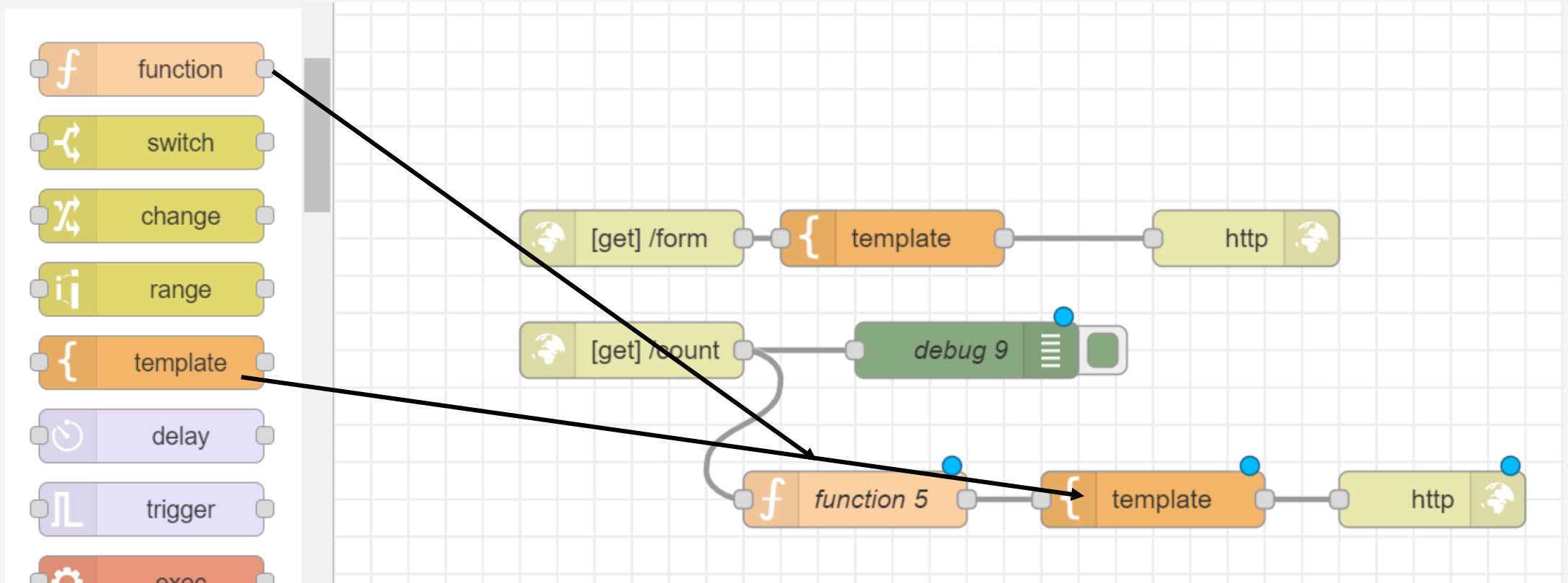
► { fav_can: "米可白" }

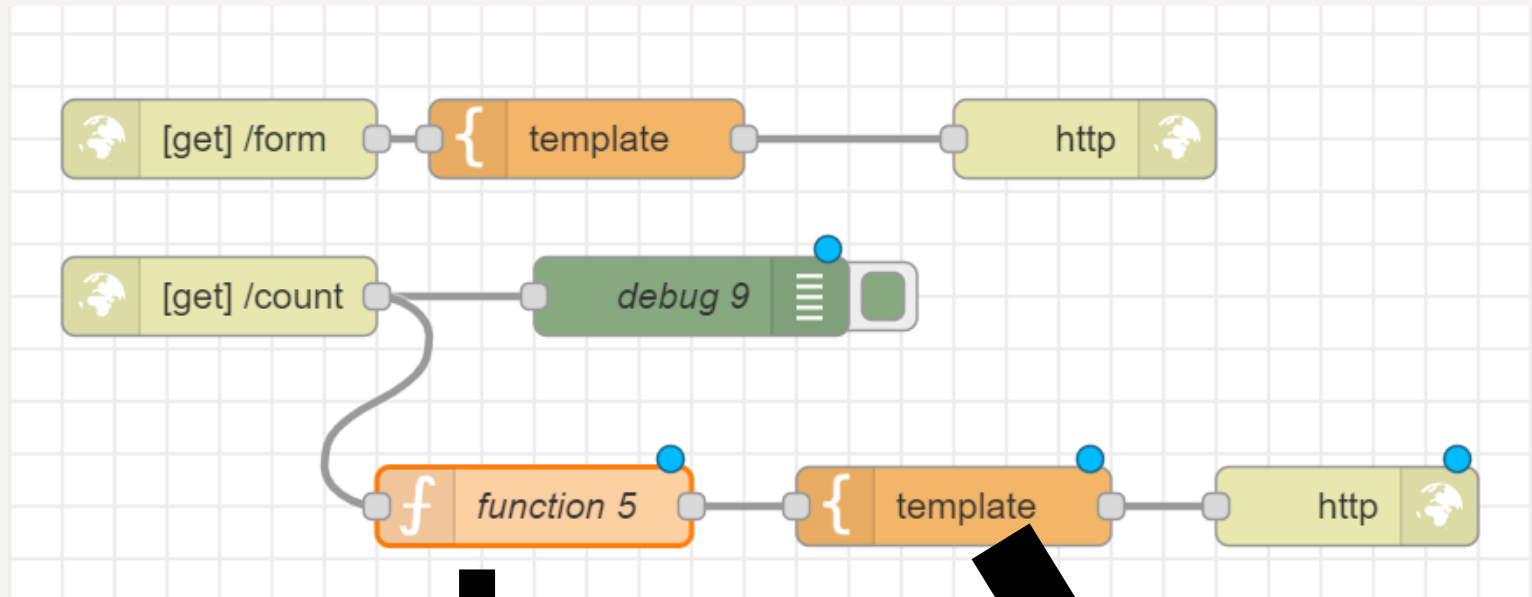


127.0.0.1:1880/count?fav_can=米可白

{"fav_can": "米可白"}

add a function node & a template node





Delete Cancel Done

⚙ Properties

🏷 Name

⚙ Setup On Start On Message On Stop

```
1 msg.payload=msg.payload.fav_can;
2 return msg;
```

Delete Cancel Done

⚙ Properties

🏷 Name

⋮ Property

📄 Template Syntax Highlight:

```
1 You vote for {{payload}} !
```

← → ↻ 🏠 ⓘ 127.0.0.1:1880/form

Choose your favorite Candidate:

☐ 侯友宜

☐ 米可白

☒ 米克斯

Submit



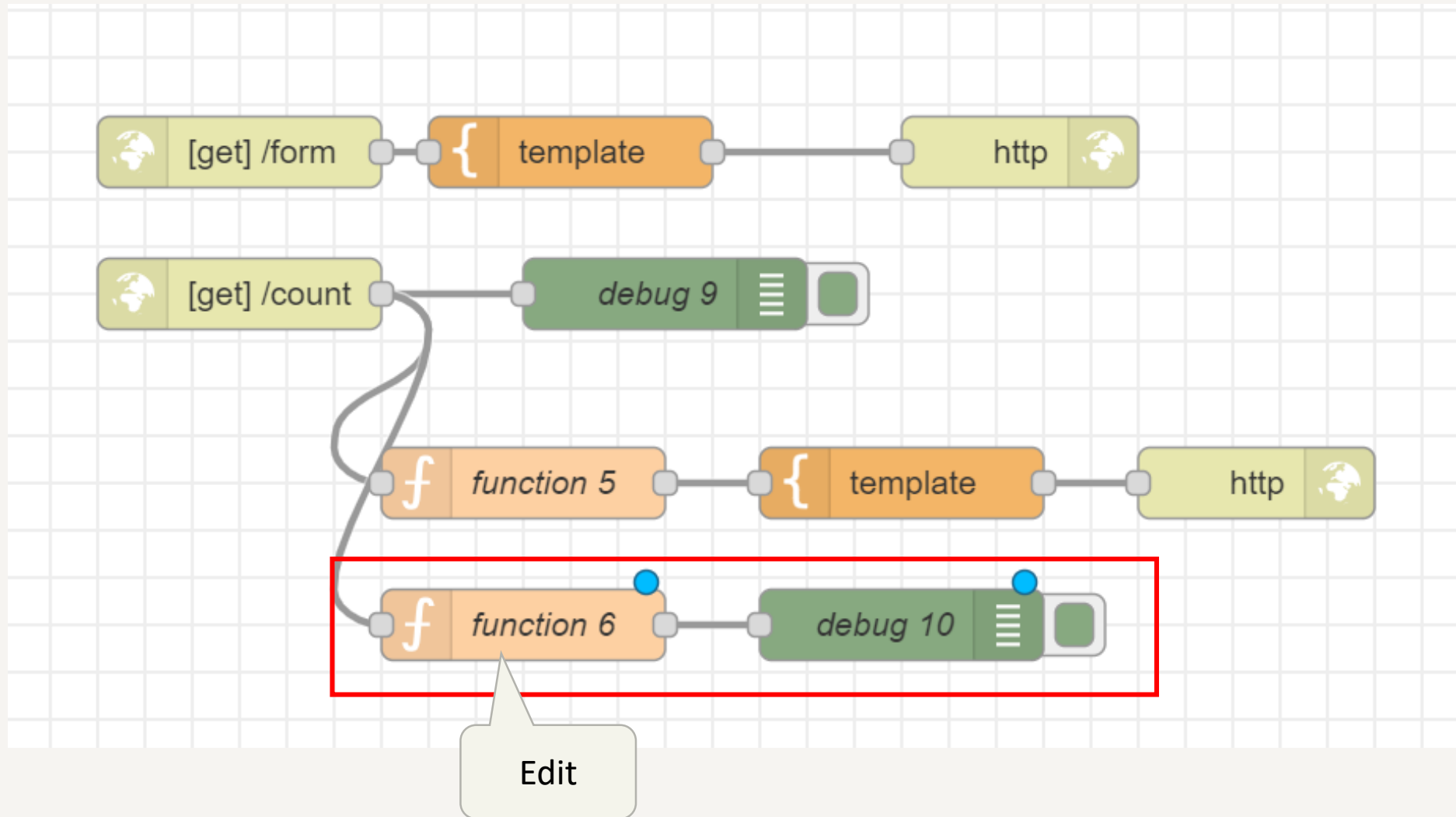
← → ↻ 🏠 ⓘ 127.0.0.1:1880/form

You vote for 米克斯 !

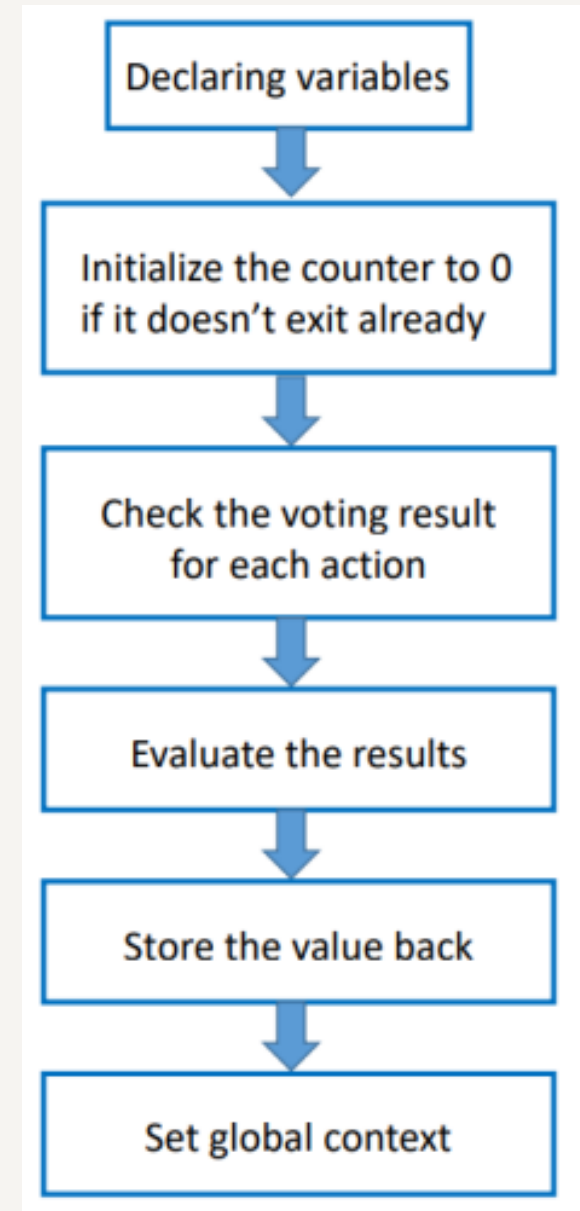
Exercise 4-4

Evaluate the voting results

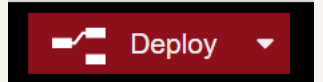
add a function node & a debug node



```
var d1=0;
var d2=0;
var d3=0;
var counter1 = context.get('counter1')||0;
var counter2 = context.get('counter2')||0;
var counter3 = context.get('counter3')||0;
if(msg.payload.fav_can == "侯友宜") {d1=1;}
else if (msg.payload.fav_can == "米可白") {d2
=1;}
else {d3 =1;}
counter1 = counter1 + d1;
counter2 = counter2 + d2;
counter3 = counter3 + d3;
context.set("counter1",counter1);
context.set("counter2",counter2);
context.set("counter3",counter3);
global.set("cou1",counter1);
global.set("cou2",counter2);
global.set("cou3",counter3);
msg.payload={"cou1":counter1,
"cou2":counter2,"cou3":counter3};
return msg;
```




```
var d1=0;
var d2=0;
var d3=0;
var counter1 = context.get('counter1')||0;
var counter2 = context.get('counter2')||0;
var counter3 = context.get('counter3')||0;
if(msg.payload.fav_can == "侯友宜") {d1=1;}
else if (msg.payload.fav_can == "米可白") {d2
=1;}
else {d3 =1;}
counter1 = counter1 + d1;
counter2 = counter2 + d2;
counter3 = counter3 + d3;
context.set("counter1",counter1);
context.set("counter2",counter2);
context.set("counter3",counter3);
global.set("cou1",counter1);
global.set("cou2",counter2);
global.set("cou3",counter3);
msg.payload={"cou1":counter1,
"cou2":counter2,"cou3":counter3};
return msg;
```



Edit function node

Delete

Cancel

Done

Properties

Name

function 6

Setup

On Start

On Message

On Stop

```
5 var counter2 = context.get('counter2')||0;
6 var counter3 = context.get('counter3')||0;
7 if(msg.payload.fav_can == "侯友宜") {d1=1;}
8 else if (msg.payload.fav_can == "米可白") {d2 =1;}
9 else {d3 =1;}
10 counter1 = counter1 + d1;
11 counter2 = counter2 + d2;
12 counter3 = counter3 + d3;
13 context.set("counter1",counter1);
14 context.set("counter2",counter2);
15 context.set("counter3",counter3);
16 global.set("cou1",counter1);
17 global.set("cou2",counter2);
18 global.set("cou3",counter3);
19 msg.payload={"cou1":counter1, "cou2":counter2,"cou3":counter3};
20 return msg;
```



Enabled

← → ↻ 🏠 ⓘ 127.0.0.1:1880/form

Choose your favorite Candidate:

- ☐ 侯友宜
- ☐ 米可白
- ☒ 米克斯

Submit

Choose your favorite Candidate:

- ☒ 侯友宜
- ☐ 米可白
- ☐ 米克斯

Submit

debug ⓘ 📄 🗑️ ⚙️ ▼

all nodes 🗑️ all ▼

2023/10/4 下午4:40:19 node: debug 9
msg.payload : Object
▶ { fav_can: "米克斯" }

2023/10/4 下午4:40:19 node: debug 10
msg.payload : Object
▶ { cou1: 0, cou2: 0, cou3: 1 }

2023/10/4 下午4:40:27 node: debug 9
msg.payload : Object
▶ { fav_can: "米克斯" }

2023/10/4 下午4:40:28 node: debug 10
msg.payload : Object
▶ { cou1: 0, cou2: 0, cou3: 2 }

msg.payload : Object
▶ { fav_can: "侯友宜" }

2023/10/4 下午4:42:35 node: debug 10
msg.payload : Object
▶ { cou1: 1, cou2: 0, cou3: 2 }

票數統計

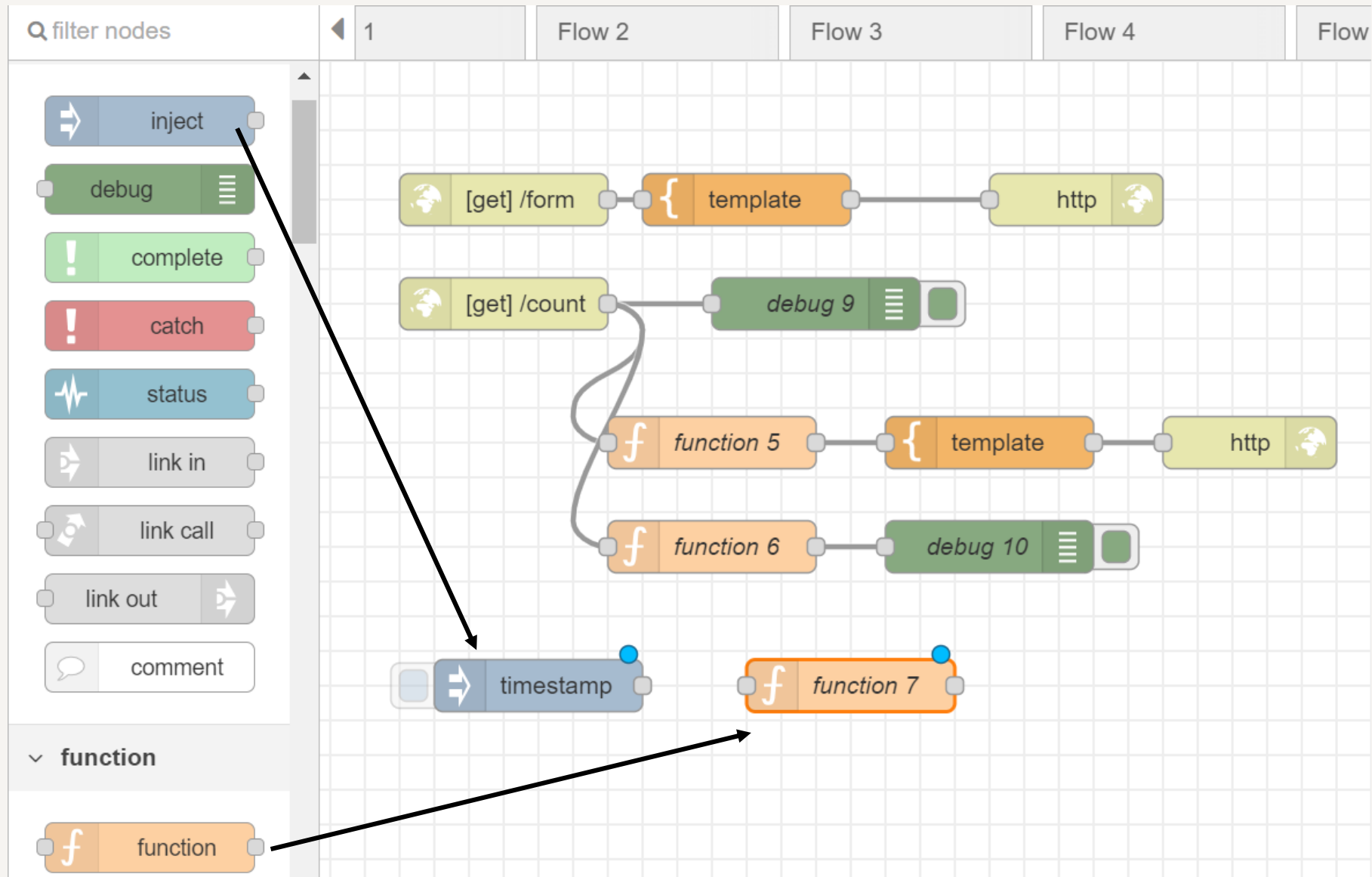
Exercise 4-5

Visualize the voting results

Exercise 4-5 Visualize the voting results



add a inject node & a function node



Edit inject node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖨

🔍 Name

Name

≡

msg. payload

=

▼ timestamp

×

≡

msg. topic

=

▼ a_z

×

+ add

inject now

☐ Inject once after 0.1 seconds, then

🔄 Repeat

interval

▼

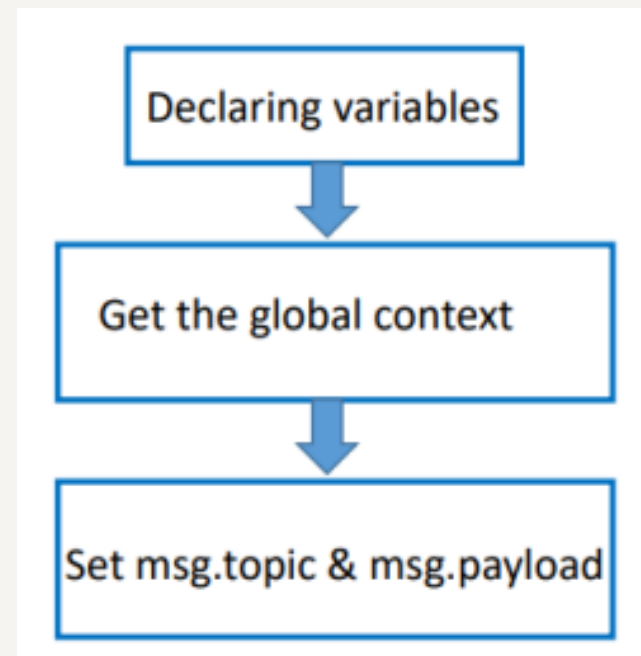
every 5

seconds

 ▼

📄

☐ Enabled



Edit function node

Edit function node

Delete

Cancel

Done

⚙ Properties

📁 Name

function 7

⚙ Setup

On Start

On Message

On Stop

```
1  var msg1={};
2  var msg2={};
3  var msg3={};
4
5  msg1.payload=global.get("cou1");
6  msg1.topic="侯友宜";
7  msg2.payload=global.get("cou2");
8  msg2.topic="米可白";
9  msg3.payload=global.get("cou3");
10 msg3.topic="米克斯";
11 return [msg1,msg2,msg3];
```

Edit function node

Delete

Cancel

Done

⚙ Properties

📁 Name

function 7

⚙ Setup

On Start

On Message

On Stop

🔗 Outputs

3

🕒 Timeout

0

📦 Modules

Module name

Import as



Edit chart node

Delete

Cancel

Done

Properties

Group

[Home] Default

Size

auto

Label

chart

Type

Line chart

☐ enlarge points

X-axis

last 1 hours OR 1000 points

X-axis Label

HH:mm:ss

☐ as UTC

Y-axis

min

max

Legend

None

Interpolate

linear




Enabled

Edit chart node > **Edit dashboard group node**

Delete Cancel Update

Properties

Name Default



Tab Home 

Class Optional CSS class name(s) for widget

Width 6

☒ Display group name

☐ Allow group to be collapsed

 Enabled  1 node uses this config



Edit chart node > Edit dashboard group node > **Edit dashboard tab node**

Delete Cancel Update

Properties

Name Home 4-5



Icon dashboard

State ☒ Enabled

Nav. Menu ☒ Visible

The **Icon** field can be either a Material Design icon (e.g. 'check', 'close') or a Font Awesome icon (e.g. 'fa-fire'), or a Weather icon (e.g. 'wi-wu-sunny').

You can use the full set of google material icons if you add 'mi-' to the icon name. e.g. 'mi-videogame_asset'.

 Enabled  1 node uses this config

Edit chart node > **Edit dashboard group node**

Delete Cancel **Update**

Properties

Name Default

Tab Home 4-5

Class Optional CSS class name(s) for widget

Width 6

☒ Display group name

☐ Allow group to be collapsed



Edit chart node

Delete Cancel **Done**

Properties

Group [Home 4-5] Default

Size auto

Label chart

Type Line chart

X-axis

X-axis Label

Y-axis min max

Legend None Interpolate linear

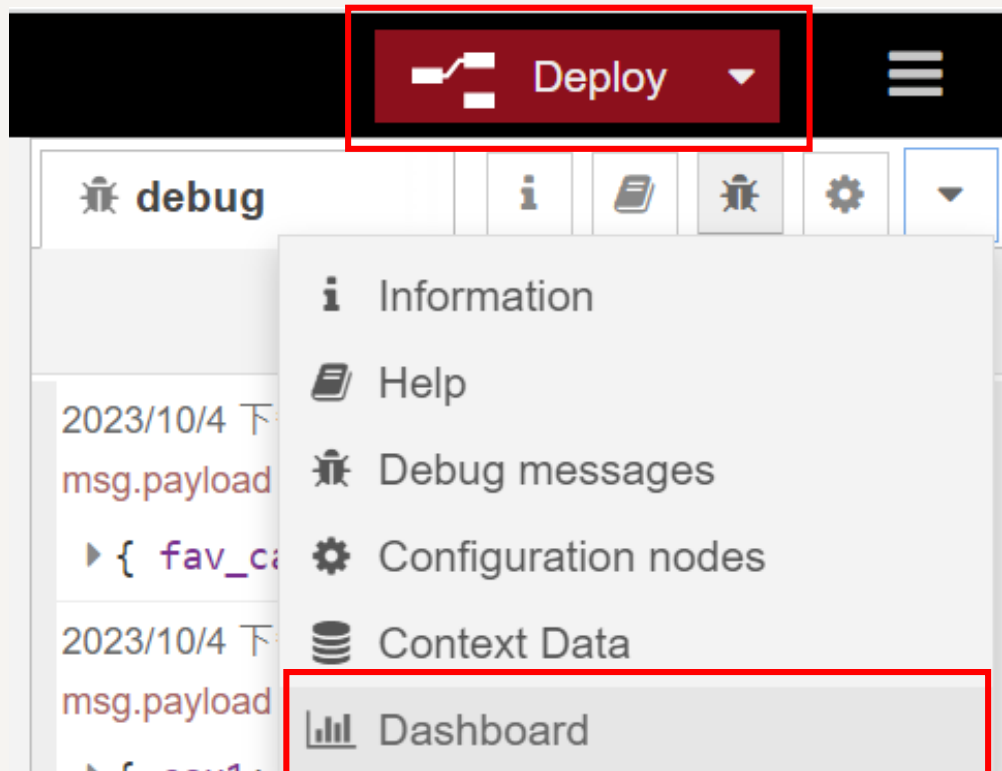
☐ enlarge points

☐ as UTC

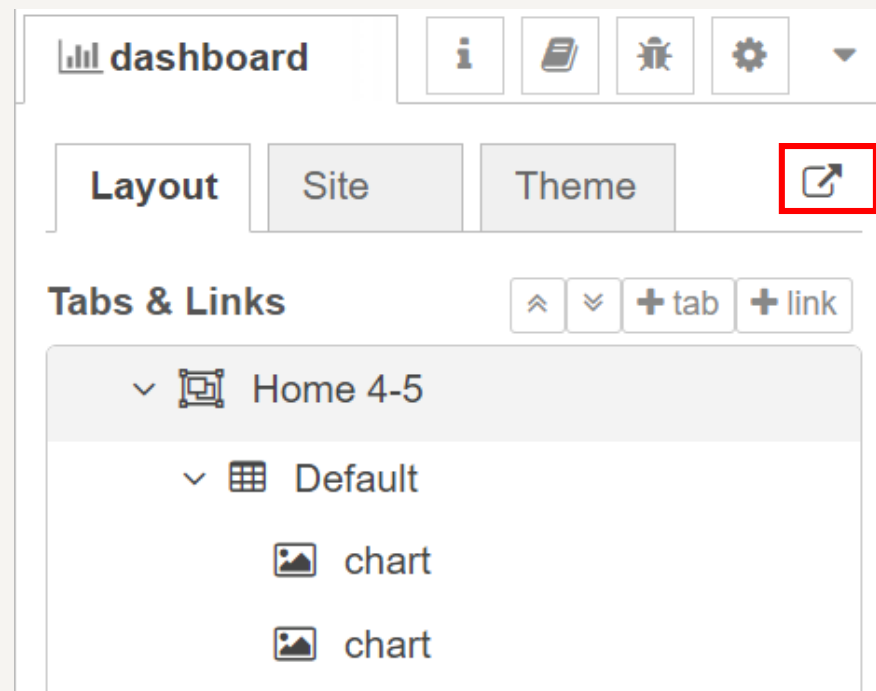
Bar chart

☐ Enabled

1



2

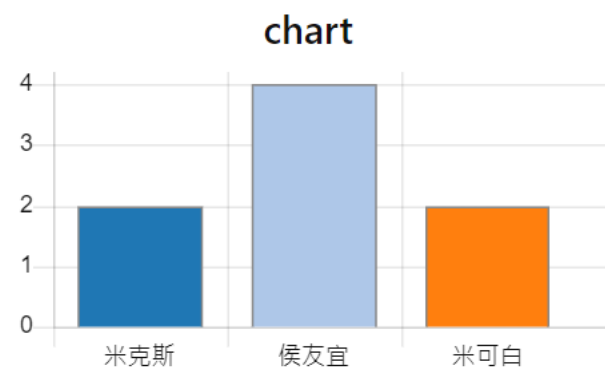


3

Result

Home 4-5

Default



Deploy

debug

2023/10/4 下午

msg.payload

▶ { fav_co

2023/10/4 下午

msg.payload

▶ { cou1:

Information

Help

Debug messages

Configuration nodes

Context Data

Dashboard

context

Node

none selected

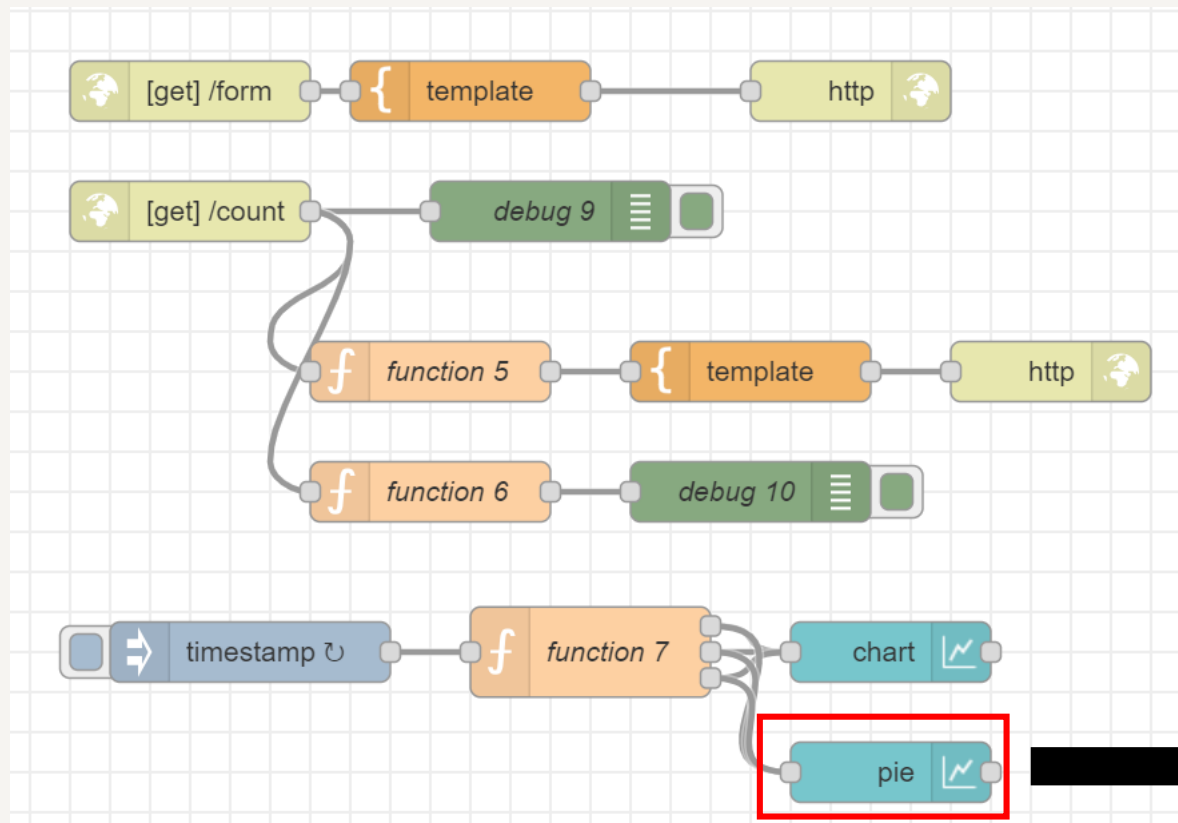
Flow

refresh to load

Global

2023/10/11 下午7:54:00

cou1	0
cou2	1
cou3	0



Edit chart node

Delete Cancel Done

Properties

Label pie

Type Pie chart

Legend None Cutout 0 %

Series Colours

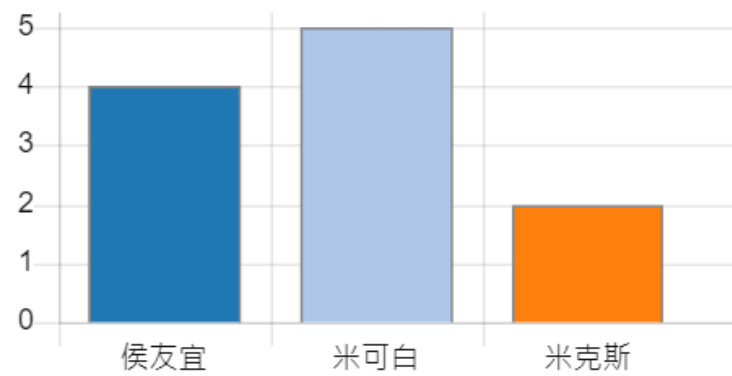
Blank label display this text before valid data arrives

</> Class Optional CSS class name(s) for widget

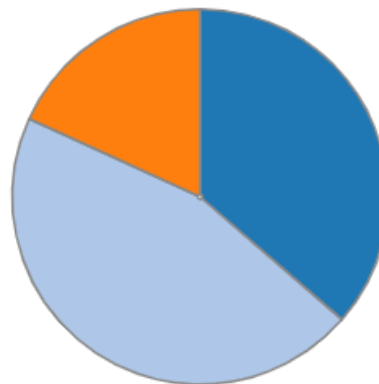
Name

Default

chart



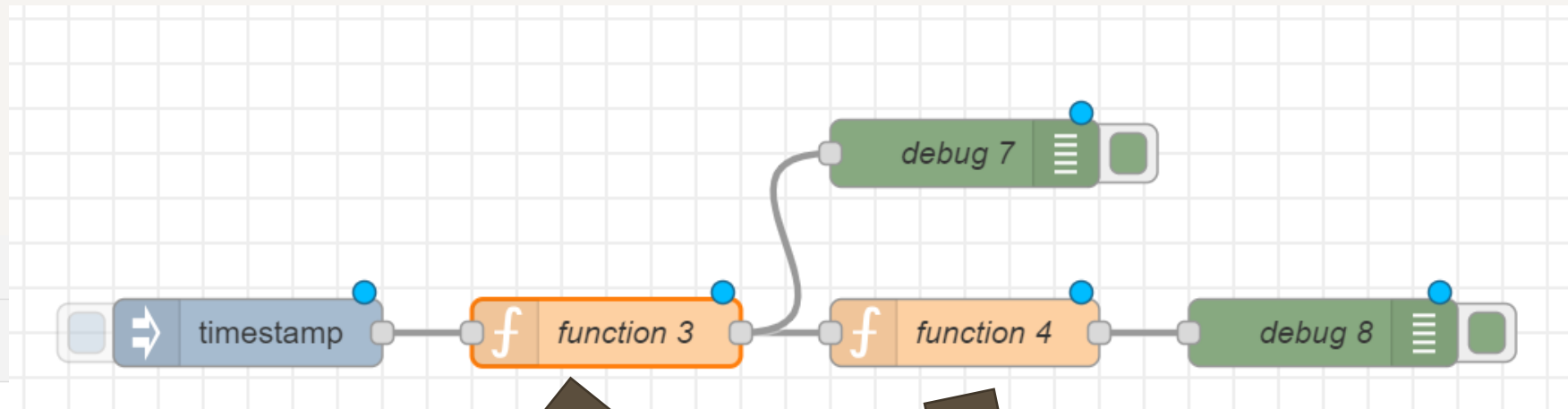
pie



chart

Homework 4-1

- For an object : {firstName:"John",lastName:"Doe",age:50,eyeColor:"blue"}
- Change the last one value to "red"



Edit function node

Delete

Properties

Name function 3

Setup

On Start

On Message

On Stop

```
1 msg.payload={firstName:"John",lastName: "Doe",age: 50,eyeColor:
2
3 return msg;
```



Enabled

Edit function node

Delete

Properties

Name function 4

Setup

On Start

On Message

On Stop

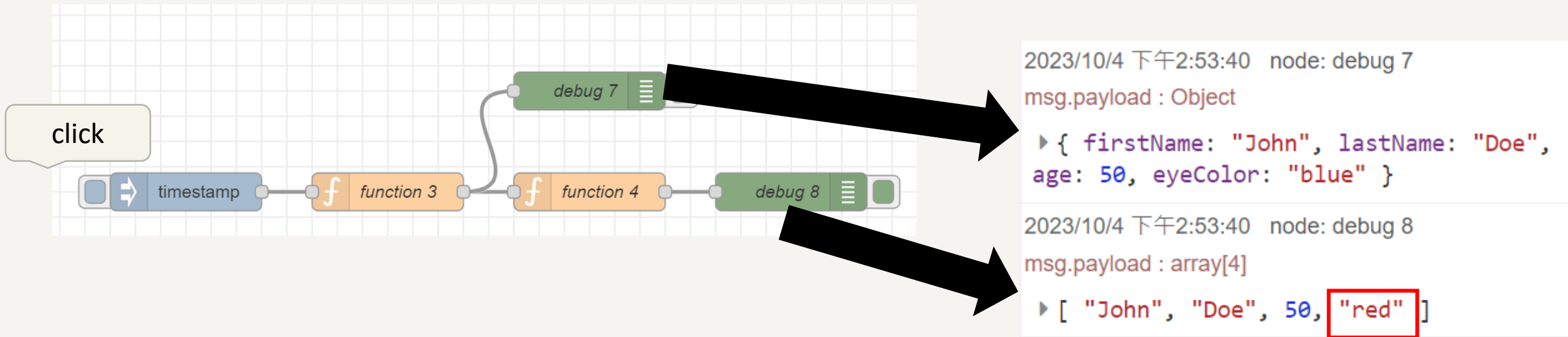
```
1 const person=msg.payload;
2 const keys = Object.values(person);
3 // let size = keys.length;
4 keys[keys.length-1]="red";
5 msg.payload=keys;
6 return msg;
```



Deploy

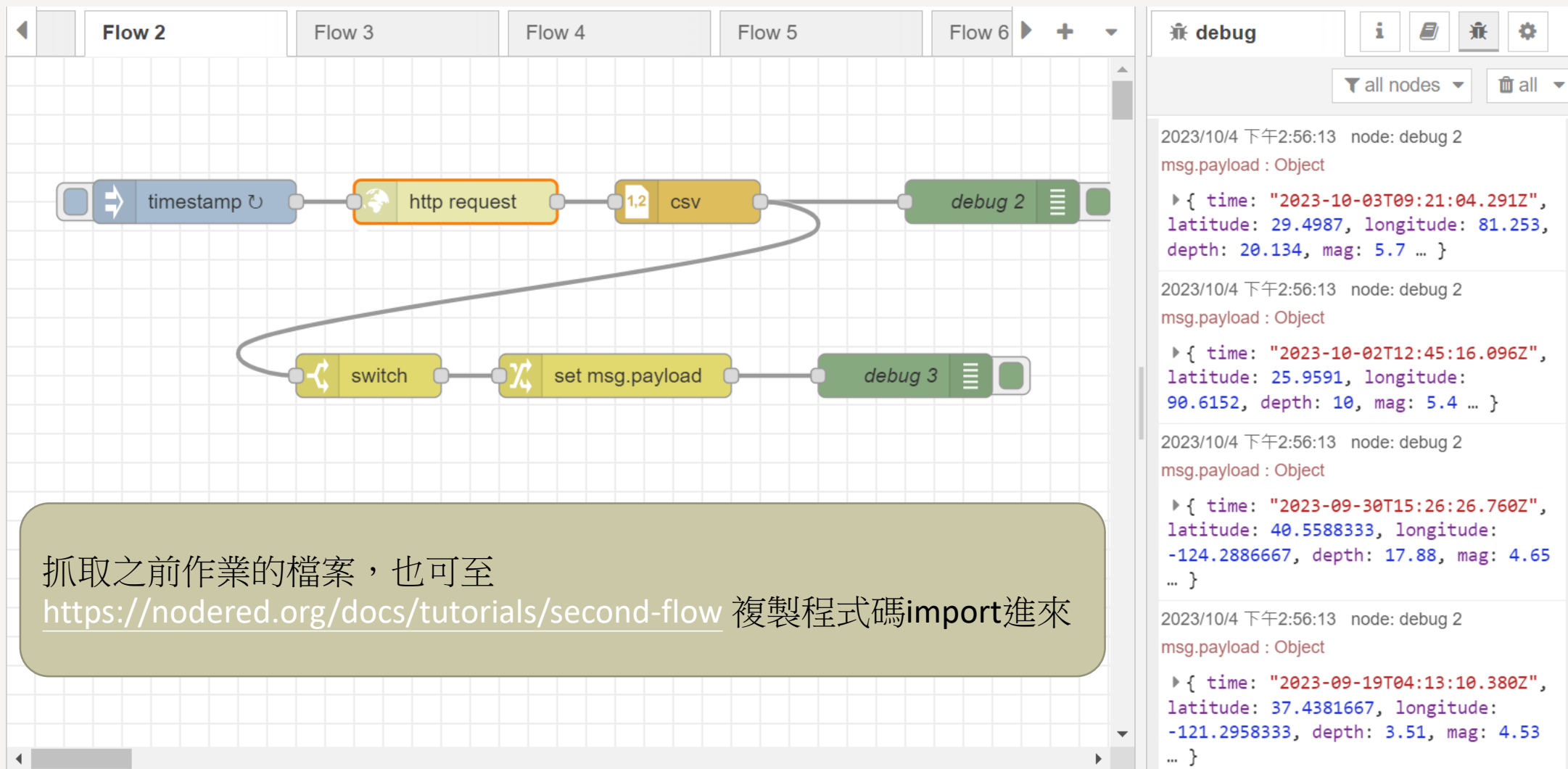
3

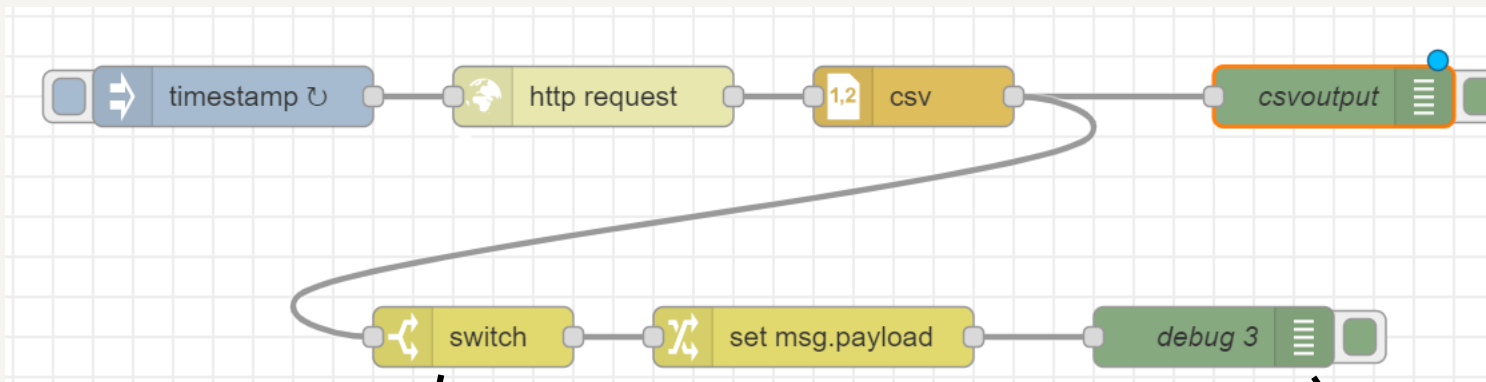
Trigger



Homework 4-2

- Print the value of mag data when the mag > 4





Edit switch node

Delete Cancel Done

Properties

Name:

Property:

→ 1

Edit debug node

Delete Cancel Done

Properties

Output:

To: ☒ debug window
☐ system console
☐ node status (32 characters)

Name:

Edit debug node

Delete Cancel Done

Properties

Output:

To: ☒ debug window
☐ system console
☐ node status (32 characters)

Name:

Edit inject node

Delete

Cancel

Done

Properties

Name

Name

msg. payload = timestamp

msg. topic = a_z

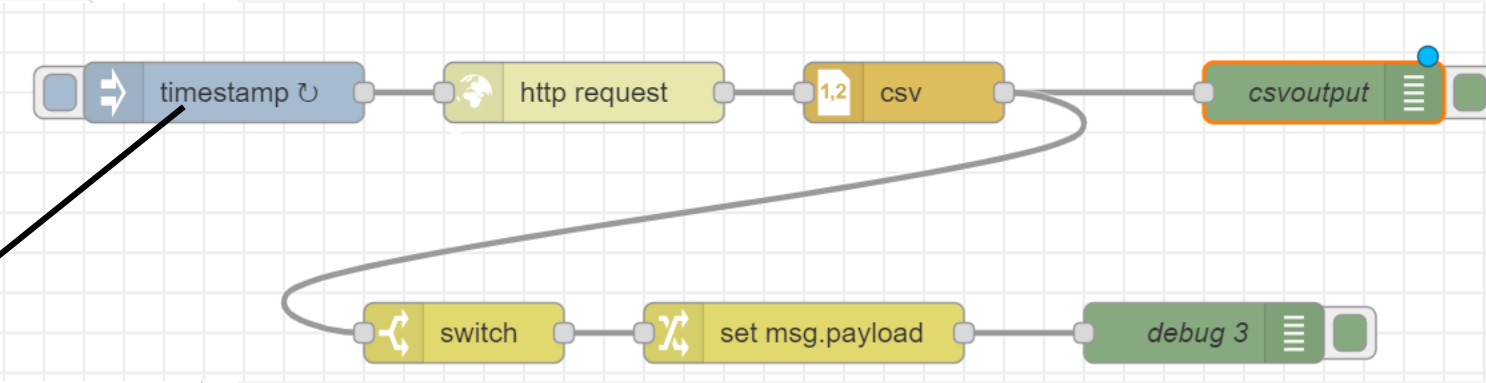
+ add

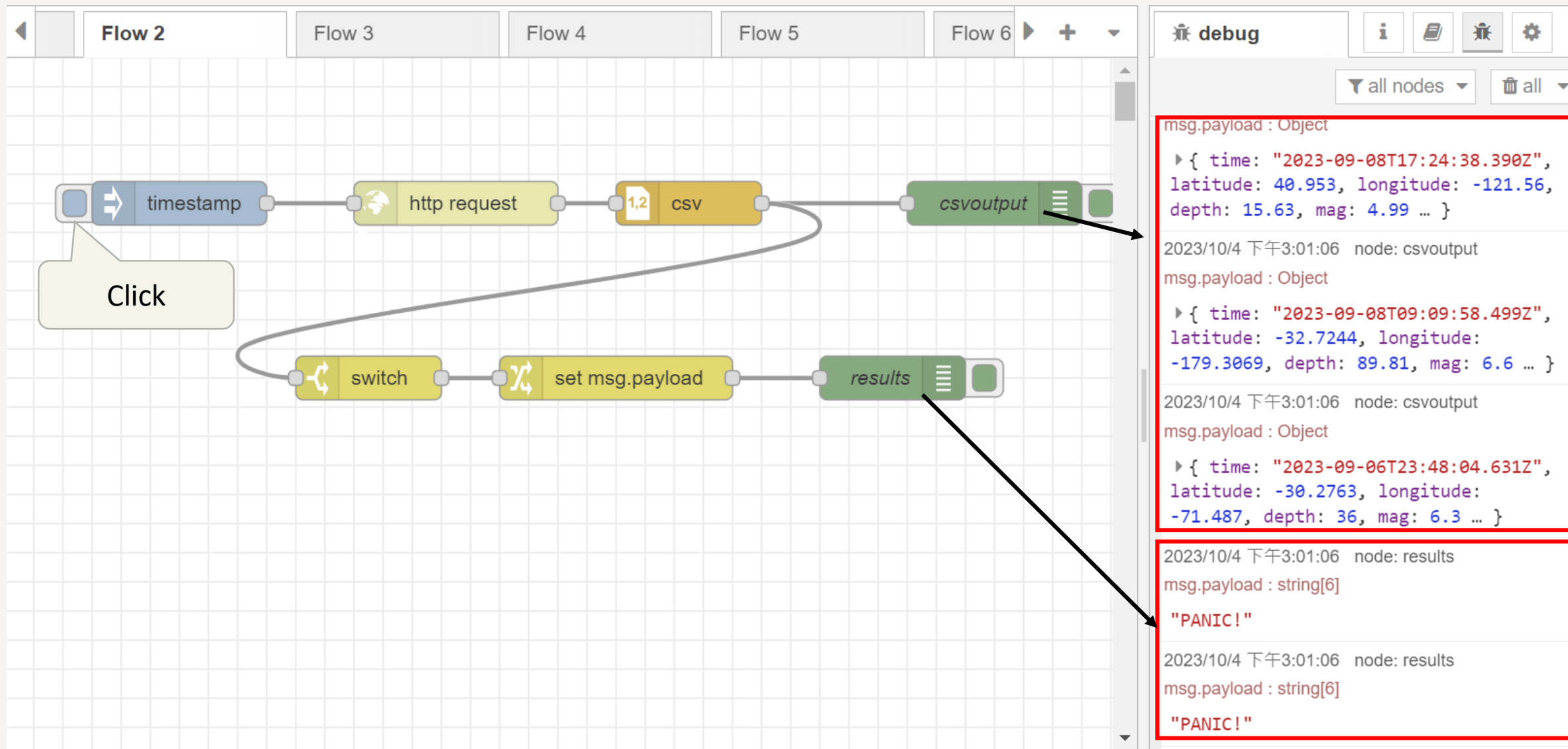
inject now

☐ Inject once after 0.1 seconds, then

Repeat none

☐ Enabled





Workflow diagram showing nodes: timestamp, http request, csv, csvoutput, switch, set msg.payload, and results.

Edit change node configuration:

- Set
- msg. payload
- to the value
- msg. payload.mag
- Deep copy value

Console output:

```
depth: 15.63, mag: 4.99 ... }
2023/10/4 下午3:20:30 node: csvoutput
msg.payload : Object
{ time: "2023-09-08T09:09:58.499Z",
  latitude: -32.7244, longitude:
-179.3069, depth: 89.81, mag: 6.6 ... }
2023/10/4 下午3:20:30 node: csvoutput
msg.payload : Object
{ time: "2023-09-06T23:48:04.631Z",
  latitude: -30.2763, longitude:
-71.487, depth: 36, mag: 6.3 ... }
2023/10/4 下午3:20:30 node: results
msg.payload : number
5.7
2023/10/4 下午3:20:30 node: results
msg.payload : number
5.4
2023/10/4 下午3:20:30 node: results
msg.payload : number
4.65
```

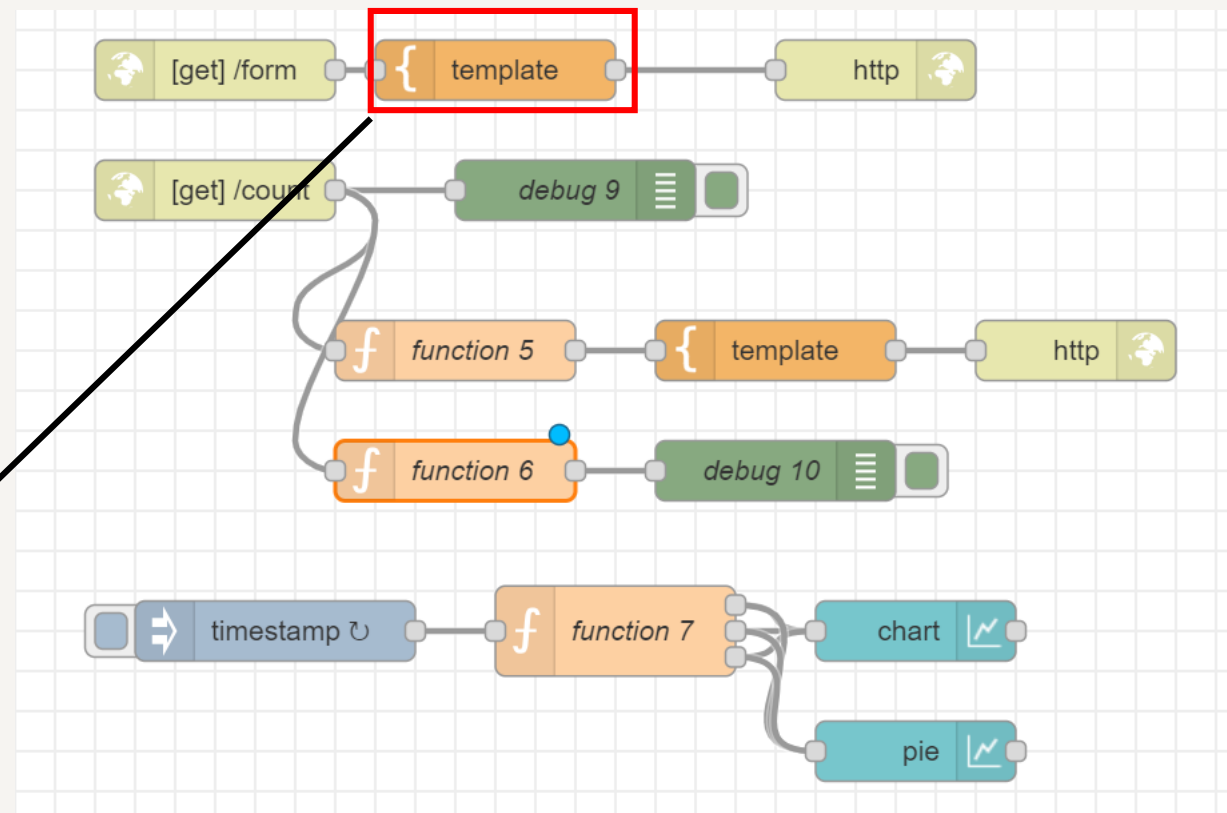
當mag值大於4時(先前switch node 做的設定)，會印出mag的值

Homework 4-3

Design a voting system for four candidates.

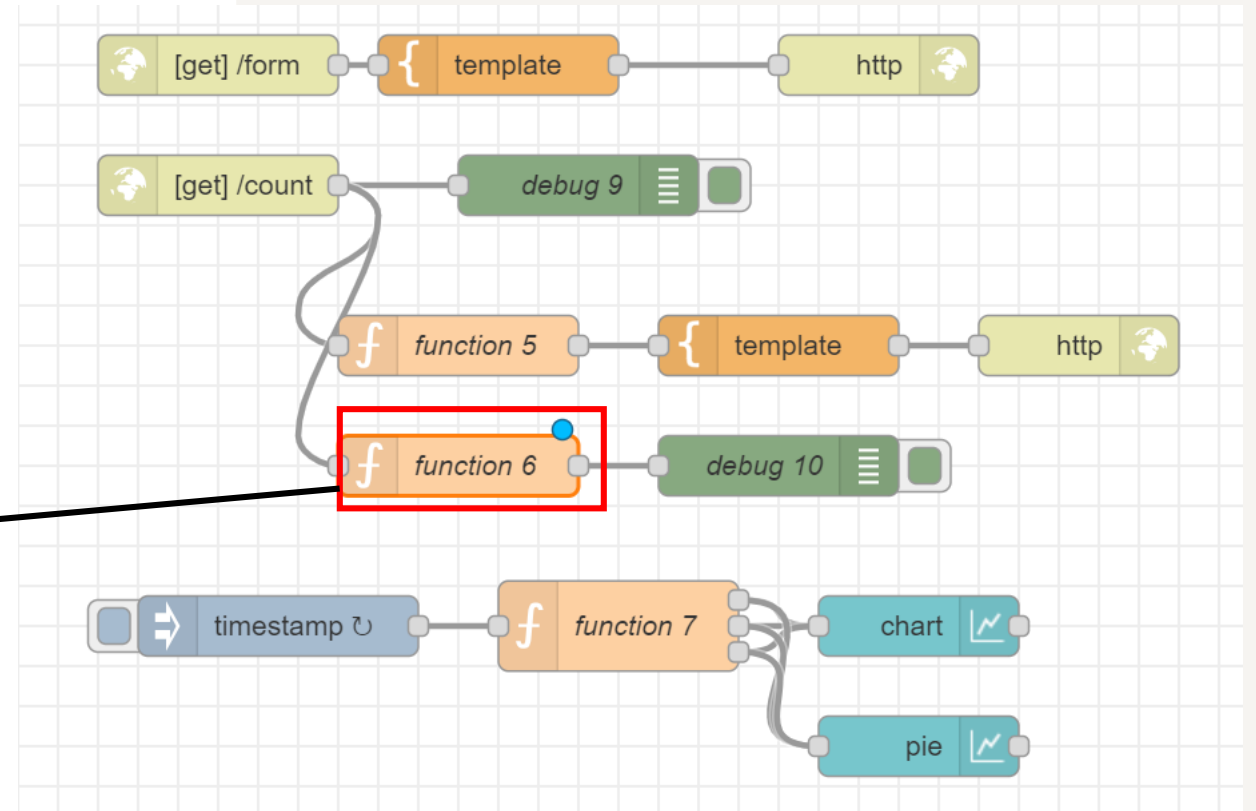
增加form第四個候選人選單

```
1  <!DOCTYPE html>
2  <html>
3  <body>
4
5  <h2>Choose your favorite Candidate:</h2>
6
7  <p></p>
8
9  <form action="/count">
10  <input type="radio" id="侯友宜" name="fav_can" value="侯友宜">
11  <label for="html">侯友宜</label><br>
12  <input type="radio" id="米可白" name="fav_can" value="米可白">
13  <label for="css">米可白</label><br>
14  <input type="radio" id="米克斯" name="fav_can" value="米克斯">
15  <label for="javascript">米克斯</label><br><br>
16  <input type="radio" id="立可白" name="fav_can" value="立可白">
17  <label for="javascript">立可白</label><br><br>
18  <input type="submit" value="Submit">
19 </form>
20
21 </body>
22 </html>
```



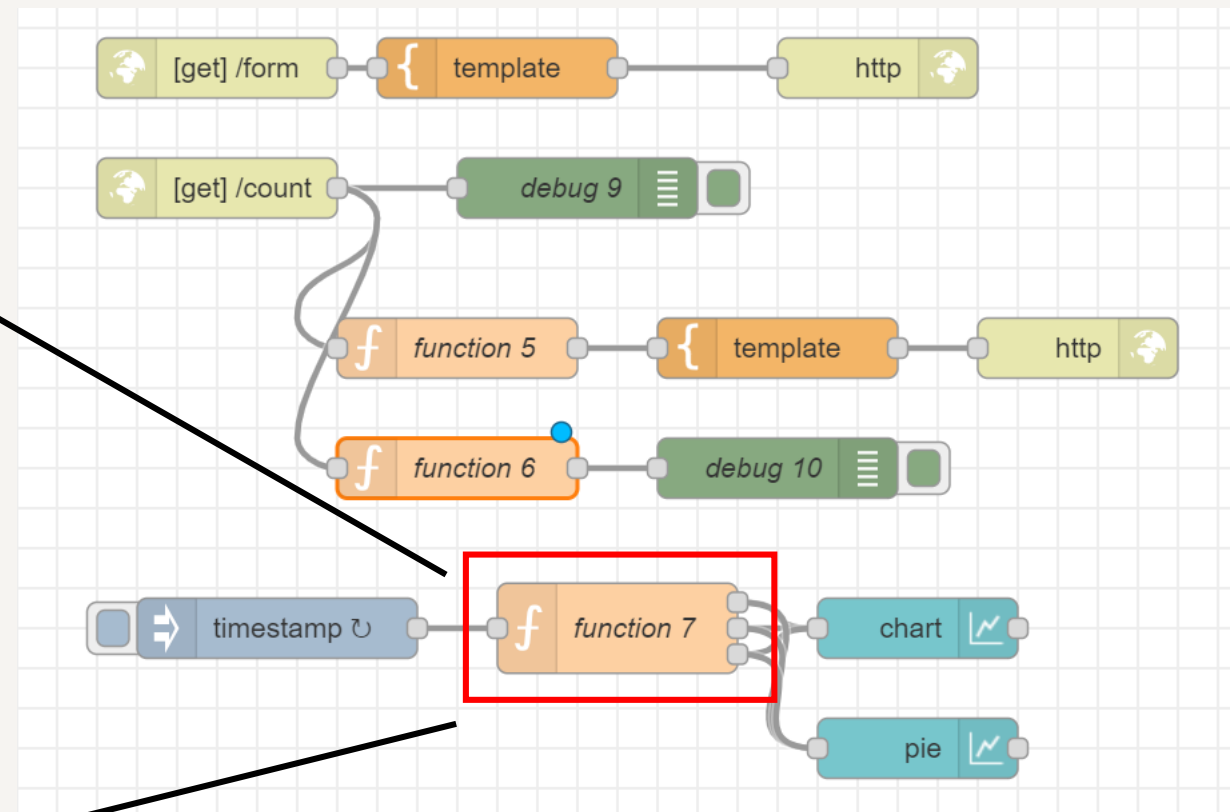
增加第四個候選人計票紀錄

```
var d1=0;
var d2=0;
var d3=0;
var d4=0;
var counter1 = context.get('counter1')||0;
var counter2 = context.get('counter2')||0;
var counter3 = context.get('counter3')||0;
var counter4 = context.get('counter4')||0;
if(msg.payload.fav_can == "侯友宜") {d1=1;}
else if (msg.payload.fav_can == "米可白") {d2 =1;}
else if (msg.payload.fav_can == "米克斯") {d3 =1;}
else {d4 =1;}
counter1 = counter1 + d1;
counter2 = counter2 + d2;
counter3 = counter3 + d3;
counter4 = counter4 + d4;
context.set("counter1",counter1);
context.set("counter2",counter2);
context.set("counter3",counter3);
context.set("counter4",counter4);
global.set("cou1",counter1);
global.set("cou2",counter2);
global.set("cou3",counter3);
global.set("cou4",counter4);
msg.payload={"cou1":counter1,
"cou2":counter2,"cou3":counter3,"cou4":counter4};
return msg;
```



增加第四個候選人計票結果

```
1  var msg1={};  
2  var msg2={};  
3  var msg3={};  
4  var msg4={};  
5  
6  msg1.payload=global.get("cou1");  
7  msg1.topic="侯友宜";  
8  msg2.payload=global.get("cou2");  
9  msg2.topic="米可白";  
10 msg3.payload=global.get("cou3");  
11 msg3.topic="米克斯";  
12 msg4.payload=global.get("cou4");  
13 msg4.topic="立可白";  
14 return [msg1,msg2,msg3,msg4];
```



Edit function node

Delete

Properties

Name function 7

Setup

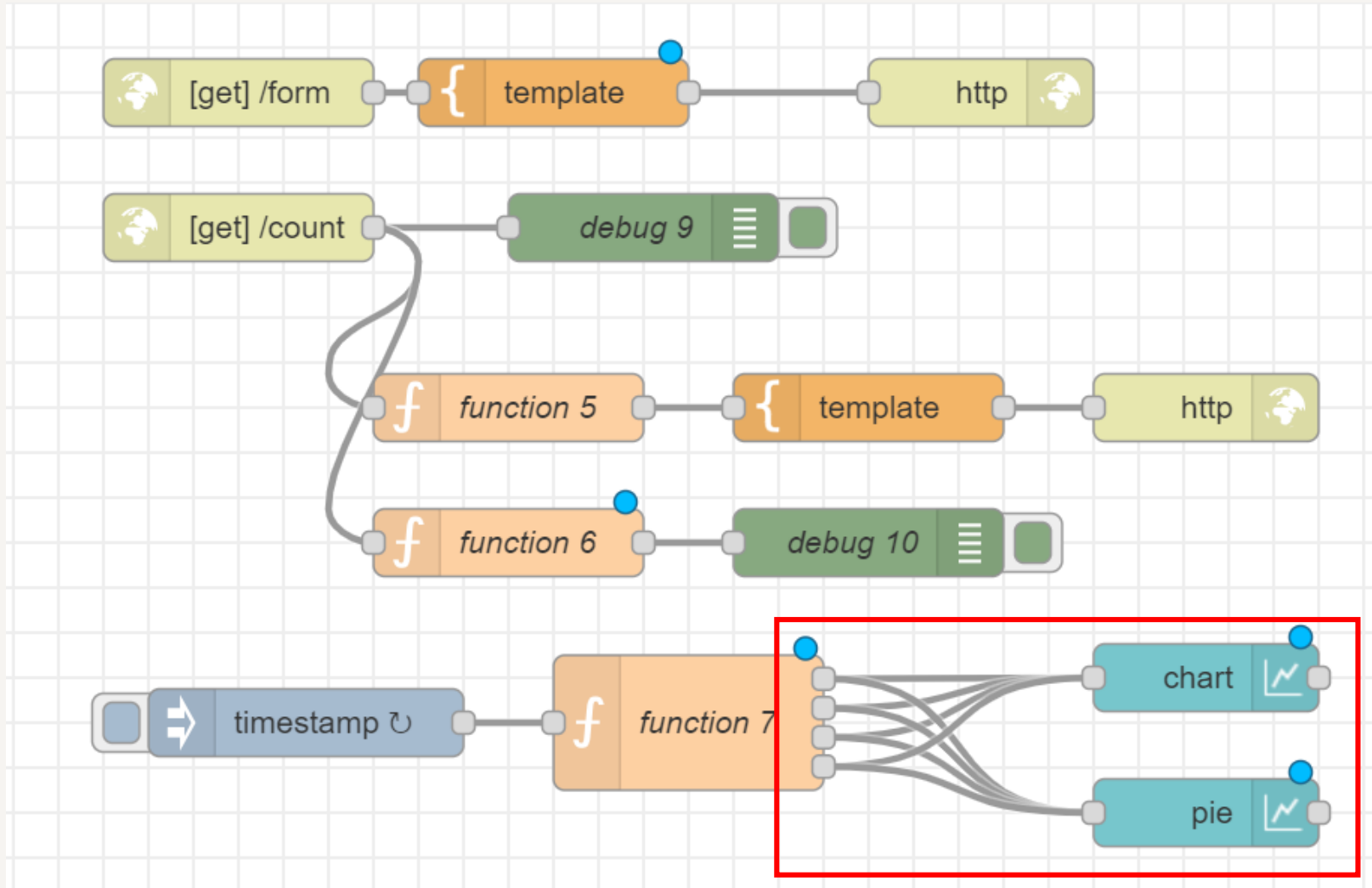
On Start

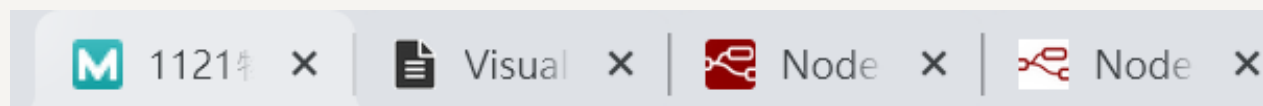
Output

Setup

4

增加第四個候選人output連到chart and pie





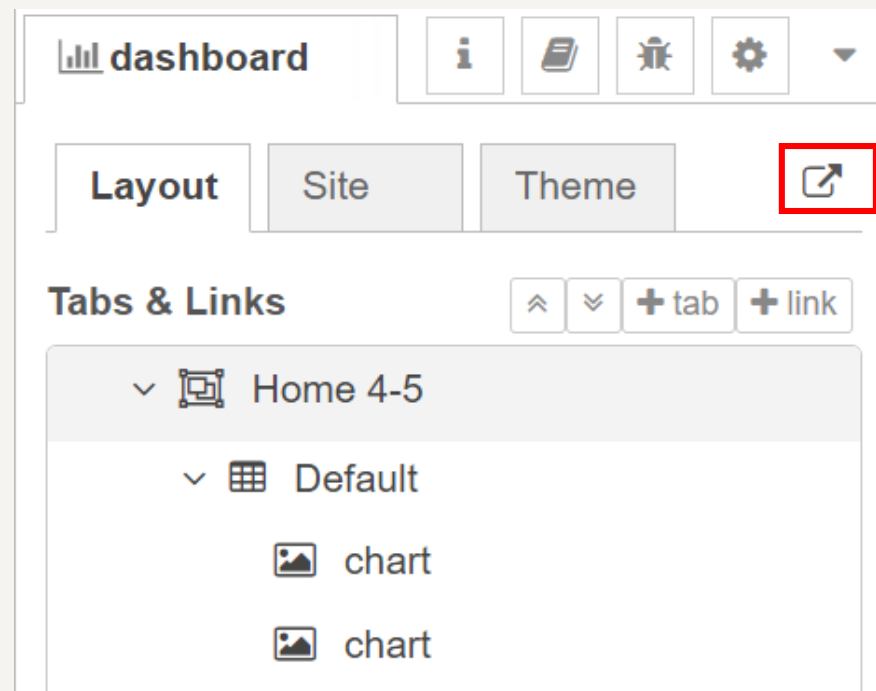
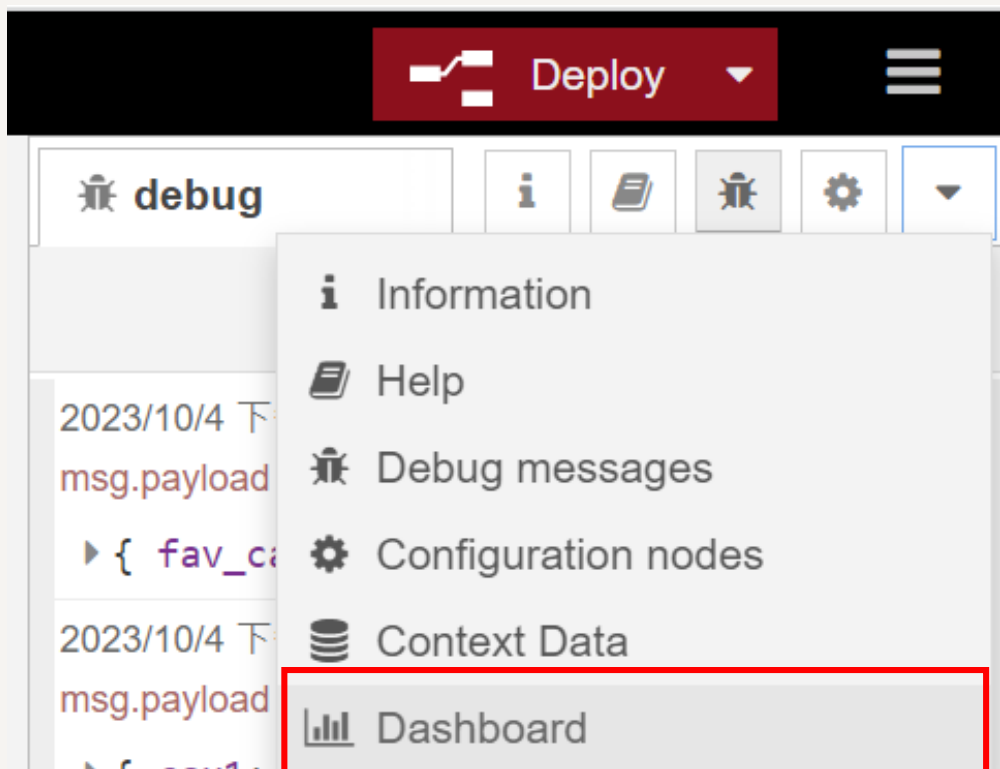
127.0.0.1:1880/form

127.0.0.1:1880/form

Choose your favorite Candidate:

- ☐ 侯友宜
- ☐ 米可白
- ☐ 米克斯
- ☐ 立可白

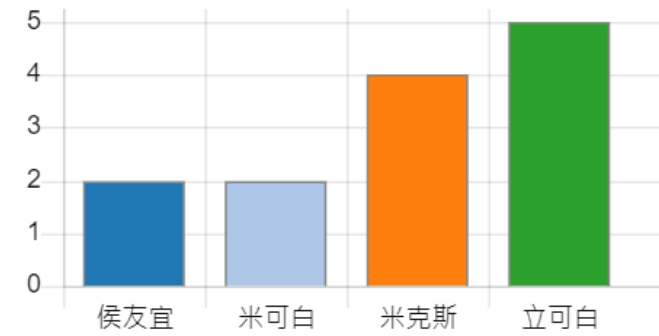
Submit



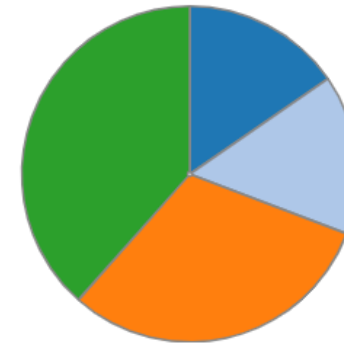
Homework 4-3

Default


chart




pie









chart


 Deploy





debug





 Information

 Help

 Debug messages

 Configuration nodes

 Context Data

 Dashboard

2023/10/4 下午

msg.payload






▶ { fav_co

2023/10/4 下午



msg.payload

▶ f cou1

context





Node




refresh to load

Flow



refresh to load

Global



2023/10/11 下午8:21:32

cou1	2
cou2	2
cou3	4
cou4	5