LAPORAN PRAKTIKUM MINGGU KE-11

IoT Platform Installation

INTERNET OF THINGS

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TI-3H

D4 TEKNIK INFORMATIKA

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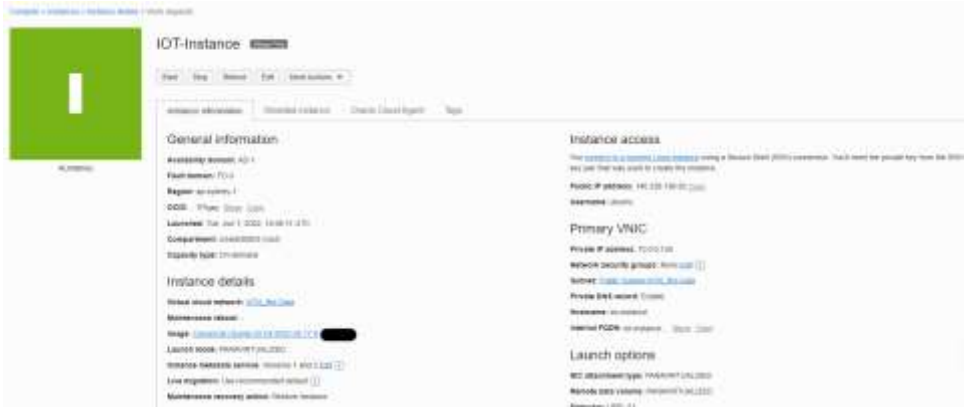
2022

LAPORAN

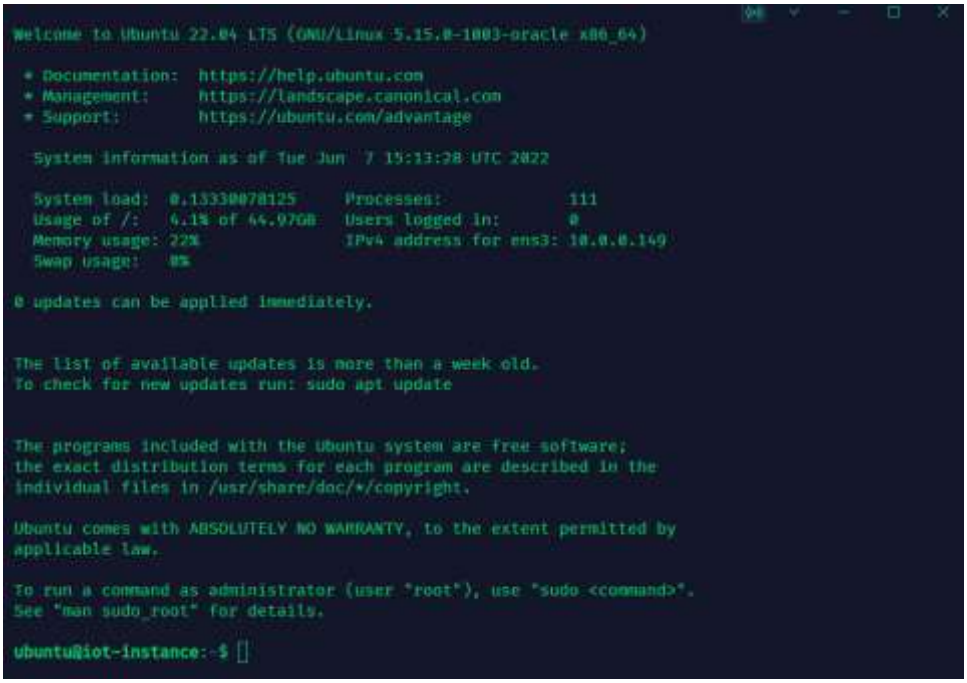
A. PRAKTIKUM

Make a new instance in Oracle Platform:



Edit ingress rules:

Accessing the recently created instance using Termius and SSH protocol:



Update ubuntu packages in the instance:

```
ubuntu@iot-instance:~$ node --version
Command 'node' not found, but can be installed with:
sudo apt install nodejs
ubuntu@iot-instance:~$ npm --version
Command 'npm' not found, but can be installed with:
sudo apt install npm
ubuntu@iot-instance:~$ sudo apt-get update
Hit:1 http://ap-sydney-1-ad-1.clouds.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-sydney-1-ad-1.clouds.archive.ubuntu.com/ubuntu jammy-updates InRelease [109 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:4 http://ap-sydney-1-ad-1.clouds.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 k
B]
Get:5 http://ap-sydney-1-ad-1.clouds.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14
.1 MB]
```

Install NodeJS and NPM:

NodeJS:

```
ubuntu@iot-instance:~$ sudo apt install nodejs
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  javascript-common libc-ares2 libjs-highlight.js libnode72 nodejs-doc
Suggested packages:
  apache2 | lighttpd | httpd npm
The following NEW packages will be installed:
  javascript-common libc-ares2 libjs-highlight.js libnode72 nodejs nodejs-doc
0 upgraded, 6 newly installed, 0 to remove and 20 not upgraded.
Need to get 13.7 MB of archives.
After this operation, 53.9 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

NPM:

```
ubuntu@iot-instance:~$ sudo apt install npm
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  adwaita-icon-theme at-spi2-core build-essential bzip2 cpp cpp-11 dconf-gsettings-backend
  dconf-service dpkg-dev fakeroot fontconfig fontconfig-config fonts-dejavu-core g++ g++-11
  gcc gcc-11 gcc-11-base gsettings-desktop-schemas gtk-update-icon-cache gyp
```

Check version:

```
ubuntu@iot-instance:~$ node --version
v12.22.9
ubuntu@iot-instance:~$ npm --version
8.5.1
```

Install Node Red using NPM:

```
ubuntu@iot-instance:~$ sudo npm install -g --unsafe-perm node-red
(                    ) ⠧ idealTree:raw-body: sill fetch manifest debug@4
```

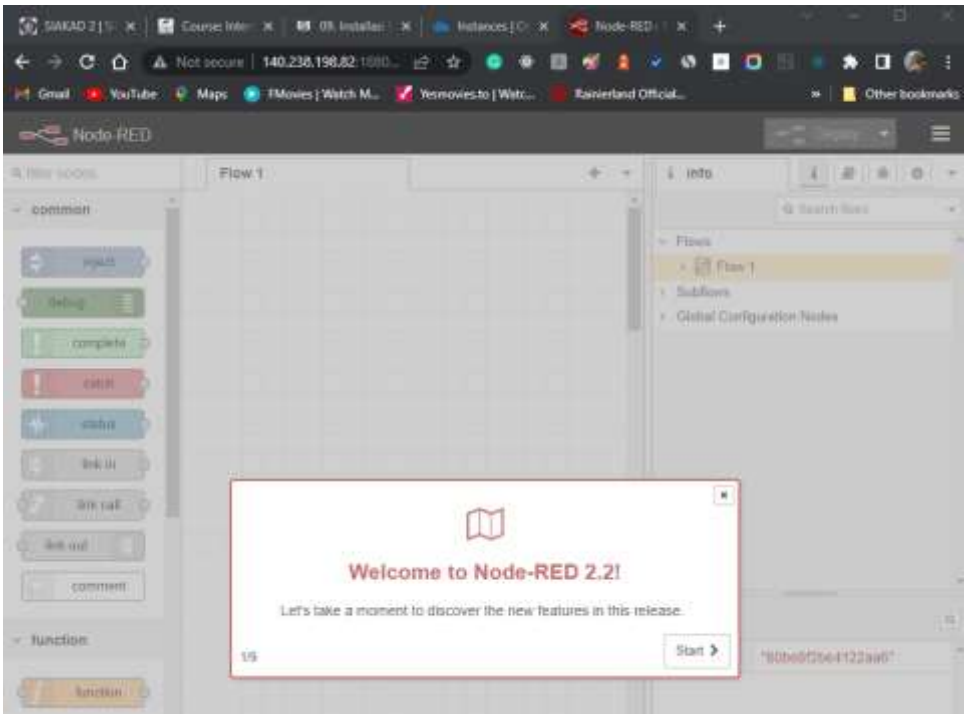
Checking Node Red availability and running:

```
ubuntu@iot-instance:~$ node-red
7 Jun 15:23:24 - [info]

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

7 Jun 15:23:24 - [info] Node-RED version: v2.2.2
7 Jun 15:23:24 - [info] Node.js  version: v12.22.9
7 Jun 15:23:24 - [info] Linux 5.15.0-1003-oracle x64 LE
7 Jun 15:23:25 - [info] Loading palette nodes
7 Jun 15:23:27 - [info] Settings file  : /home/ubuntu/.node-red/settings.js
7 Jun 15:23:27 - [info] Context store  : 'default' [module=memory]
7 Jun 15:23:27 - [info] User directory : /home/ubuntu/.node-red
7 Jun 15:23:27 - [warn] Projects disabled : editorTheme.projects.enabled=false
7 Jun 15:23:27 - [info] Flows file     : /home/ubuntu/.node-red/flows.json
```

Change the instance configuration to allow Node Red to run on port 1880:

```
ubuntu@iot-instance:~$ sudo iptables -I INPUT 6 -m state --state NEW -p tcp --dport 1880 -j ACCE
PT
ubuntu@iot-instance:~$ sudo netfilter-persistent save
run-parts: executing /usr/share/netfilter-persistent/plugins.d/15-ip4tables save
run-parts: executing /usr/share/netfilter-persistent/plugins.d/25-ip6tables save
ubuntu@iot-instance:~$
```

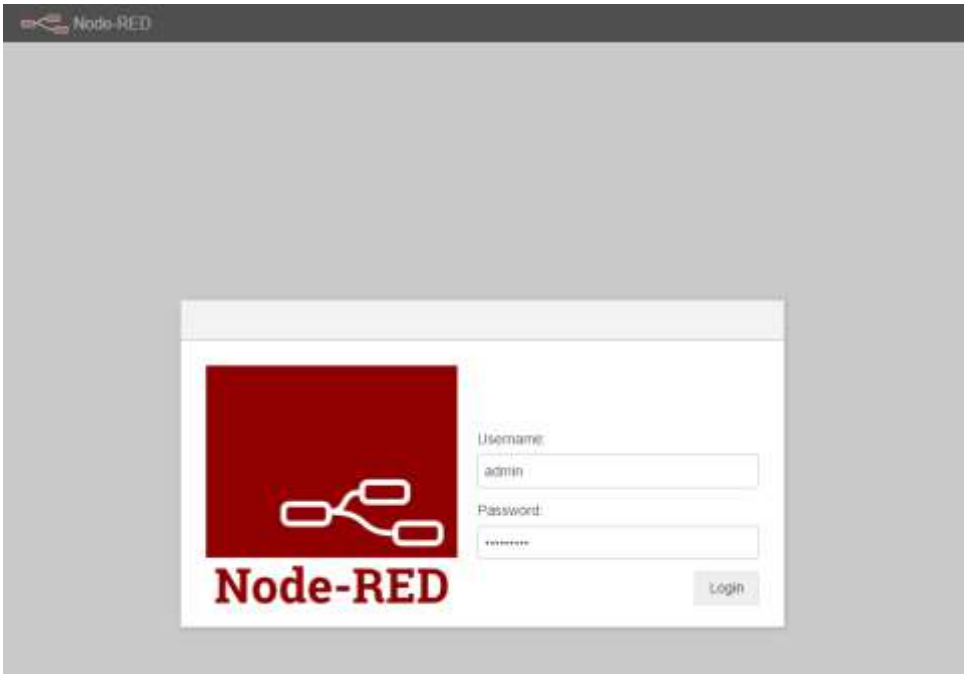
Node Red on Oracle Instance:

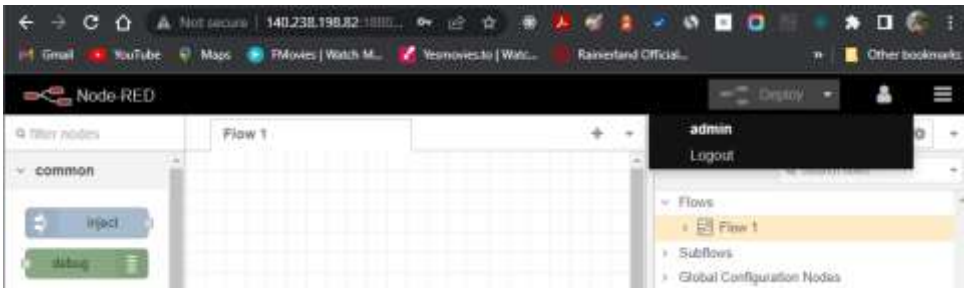


Adding Security to Node-Red:

```
ubuntu@iot-instance:~$ node-red admin hash-pw
Password:
$2b$08$lKnwqcC2ojL4qgfLeSO9luEIH4vU08m2NXJOh2qpyWoanEFZThWVa
ubuntu@iot-instance:~$ sudo nano .node-red/settings.js
```

```
 GNU nano 6.2                          .node-red/settings.js *
 *   - requireHttps
 *   - httpNodeAuth
 *   - httpStaticAuth
 ********************************************************************/

    /** To password protect the Node-RED editor and admin API, the following
     * property can be used. See http://nodered.org/docs/security.html for details.
     */
    adminAuth: {
        type: "credentials",
        users: [{
            username: "admin",
            password: "$2b$08$lKnwqcC2ojL4qgfLeSO9luEIH4vU08m2NXJOh2qpyWoanEFZThWVa",
            permissions: "*"
        }]
```





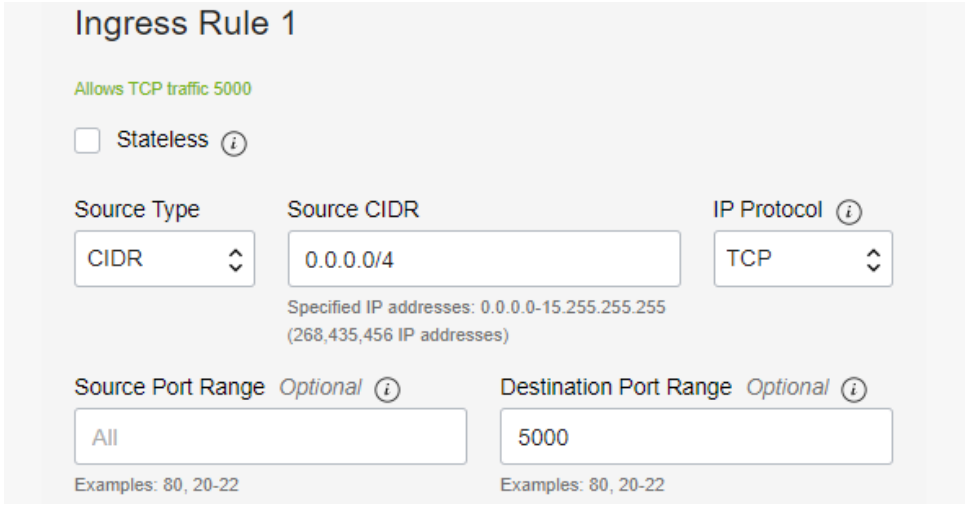
Question

- Change the default port of Node-RED and prove that Node-RED can be accessed from the public network?

  Change the uiPort variable in settings.js:

  Add new ingress rule for the new port:

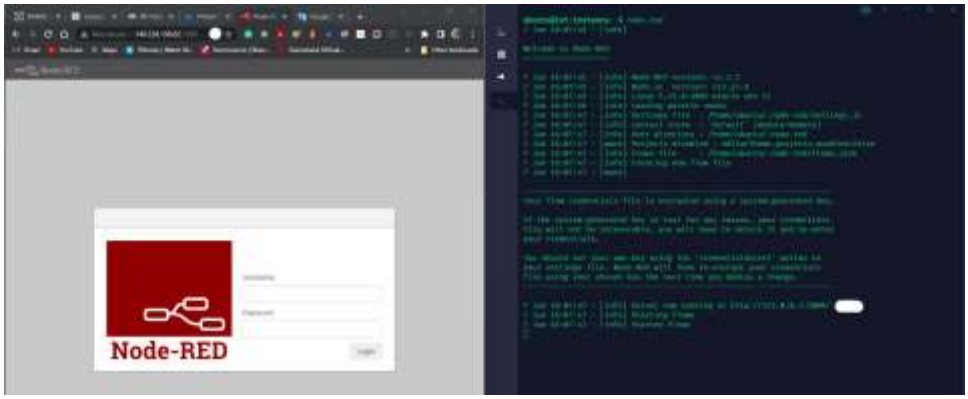
Enable the new port to be accessed in the instance:

```
ubuntu@iot-instance:~$ sudo iptables -I INPUT 6 -m state --state NEW -p tcp --dport 5000 -j ACCE
PT
ubuntu@iot-instance:~$ sudo netfilter-persistent save
run-parts: executing /usr/share/netfilter-persistent/plugins.d/15-ip4tables save
run-parts: executing /usr/share/netfilter-persistent/plugins.d/25-ip6tables save
```

Run Node Red again:

```
ubuntu@iot-instance:~$ node-red
7 Jun 15:53:16 - [info]

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

7 Jun 15:53:16 - [info] Node-RED version: v2.2.2
7 Jun 15:53:16 - [info] Node.js  version: v12.22.9
7 Jun 15:53:16 - [info] Linux 5.15.0-1003-oracle x64 LE
7 Jun 15:53:17 - [info] Loading palette nodes
7 Jun 15:53:18 - [info] Settings file  : /home/ubuntu/.node-red/settings.js
7 Jun 15:53:18 - [info] Context store  : 'default' [module=memory]
7 Jun 15:53:18 - [info] User directory : /home/ubuntu/.node-red
7 Jun 15:53:18 - [warn] Projects disabled : editorTheme.projects.enabled=false
7 Jun 15:53:18 - [info] Flows file     : /home/ubuntu/.node-red/flows.json
7 Jun 15:53:18 - [info] Creating new flow file
7 Jun 15:53:18 - [warn]

---------------------------------------------------------------------
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.
---------------------------------------------------------------------

7 Jun 15:53:18 - [info] Server now running at http://127.0.0.1:5000/
```

It works on port 5000



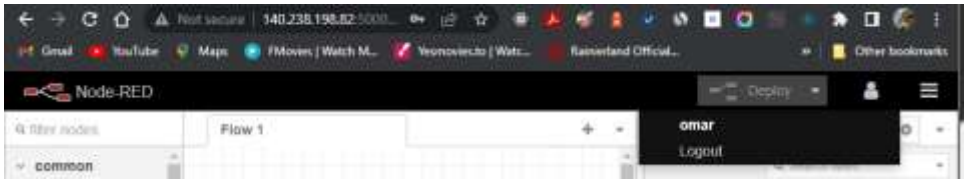
- Prove with screenshots the difference between permissions for user read and full access?

  Create a new password

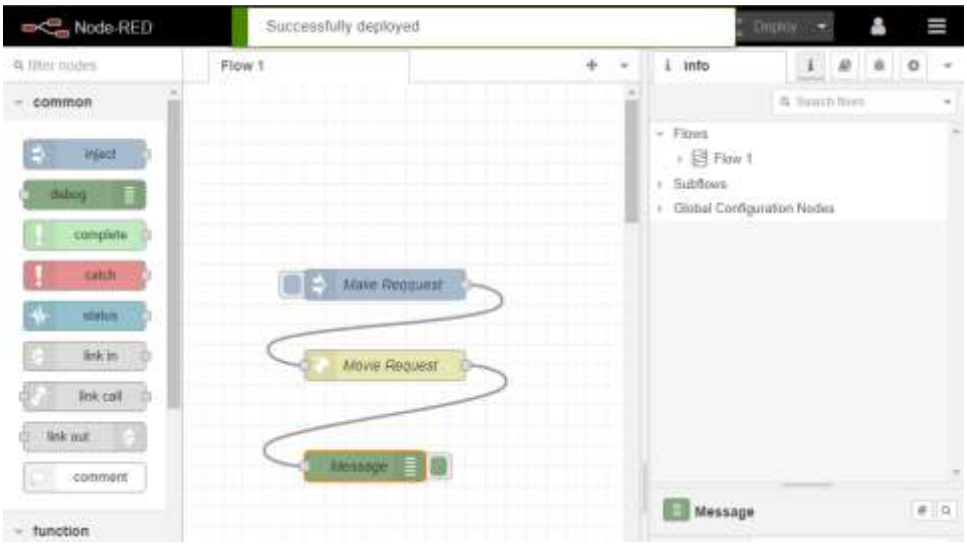
```
ubuntu@iot-instance:~$ node-red admin hash-pw
Password:
$2b$08$5ll3tXJnmArScwlQK7rN8O6XVXsji35HSJj1dAJMXiNRj2EoKWxCi
ubuntu@iot-instance:~$ sudo nano .node-red/settings.js
```

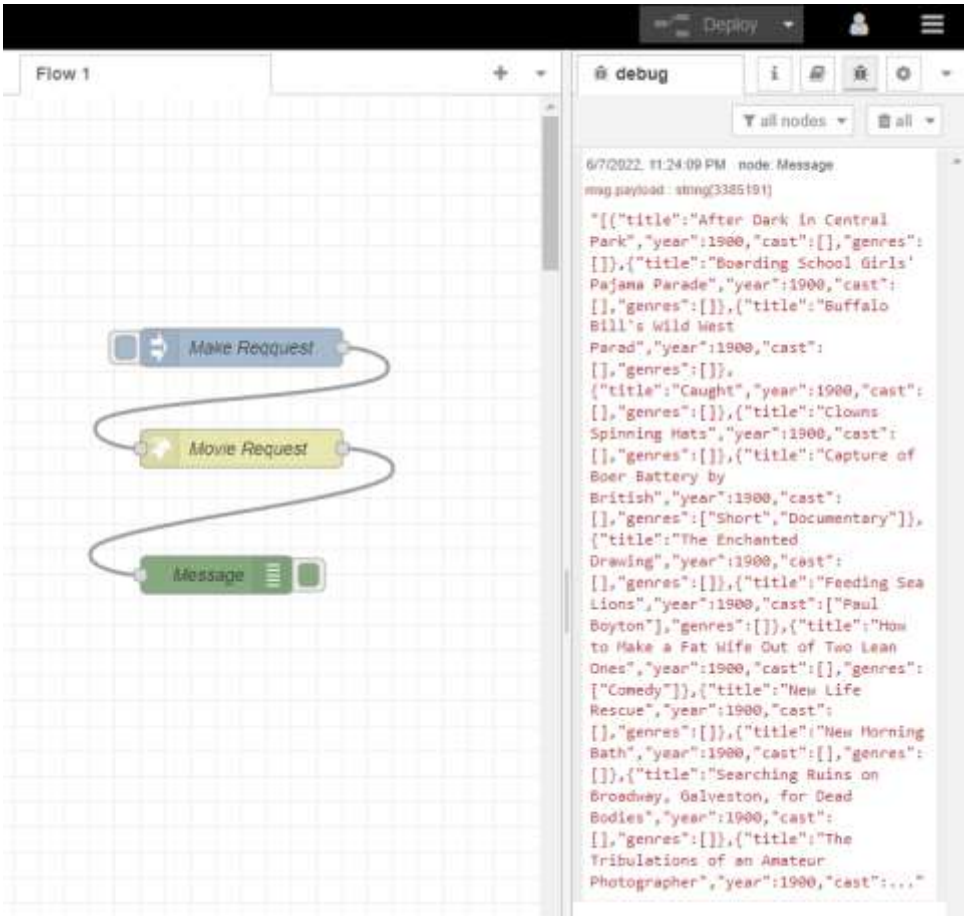
Add a new user with the new user

```
/** To password protect the Node-RED editor and admin API, the following
 * property can be used. See http://nodered.org/docs/security.html for details.
 */
adminAuth: {
    type: "credentials",
    users: [{
        username: "admin",
        password: "$2b$08$lKnwqcC2ojL4qgfLeSO9luEIH4vU08m2NXJOh2qpyWoanEFZThWVa",
        permissions: "*"
    },{
    username: "omar",
    password:  "$2b$08$5ll3tXJnmArScwlQK7rN8O6XVXsji35HSJj1dAJWXiNRj2EoKWxCi",
    permissions: "read"
    }]
},
```



Sample Node-Red





Question

- Add back the function node and debug node, each of which functions to filter where only movies with the year > 2000 will appear and to display the filter data.
- Flow and debug output can be seen as follows