Raspberry Pi

Raspberry Pi tutorial

- Introduction
- Setting headless Raspberry pi
- Install library
- Introduction to python programming
- WebGui using Dash

Raspberry pi

Raspberry Pi Boards

Raspberry Pi Zero

Raspberry Pi 4 Model B

Raspberry Pi 3 Model A+

Raspberry Pi 3 Model B+

Raspberry Pi 3 Model B

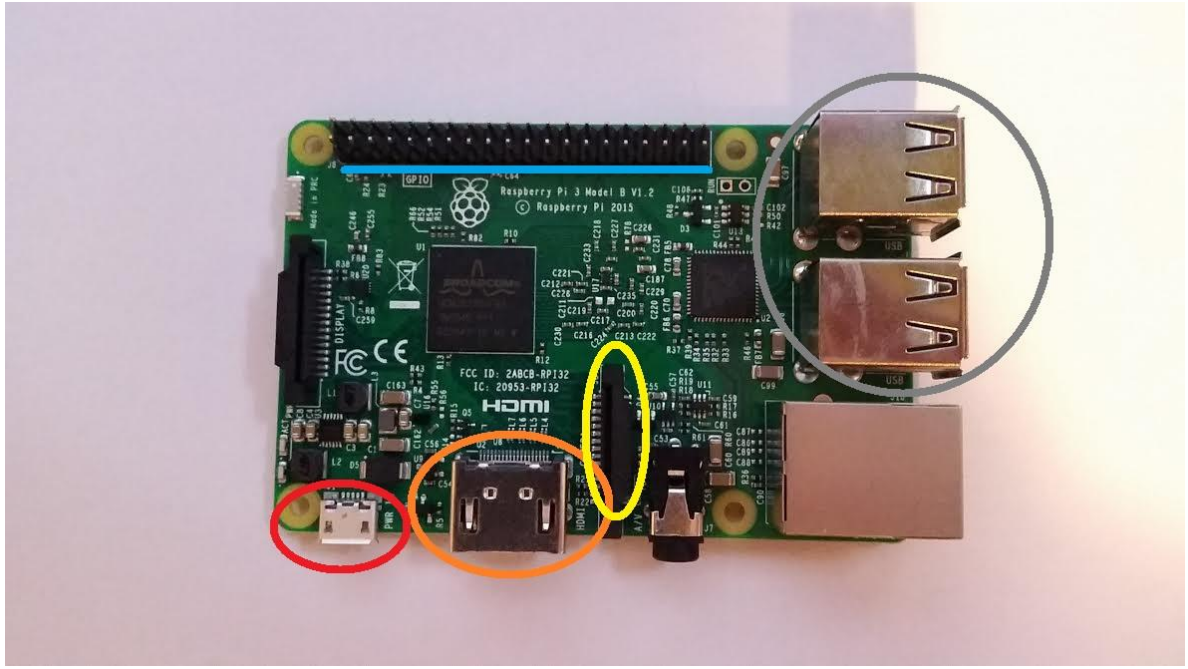
Raspberry Pi 2 Model B

Raspberry Pi 1 Model B+

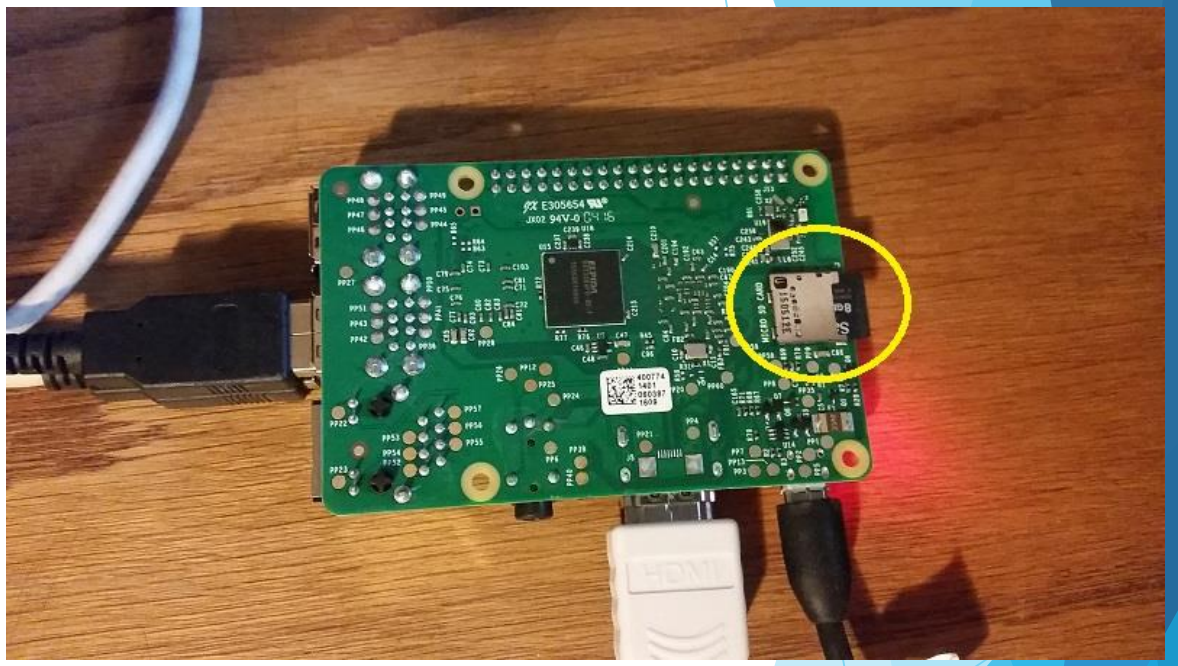
Raspberry Pi 1 Model A+

Raspberry Pi Zero W

Raspberry pi 3



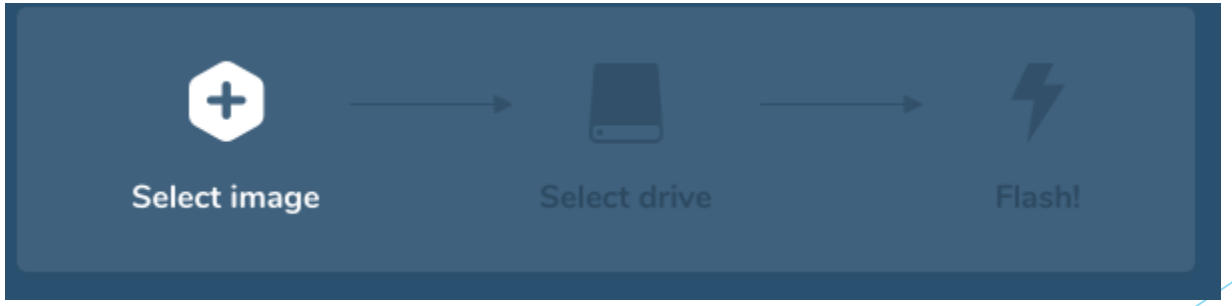
4x USB
Power micro usb
HDMI display
Camera interface
Ethernet
GPIO



Mico sd

Install sdcard

- Download image
- Connect sdcard
- Find Raspberry pi *.img
- Flash



Setting headless Rpi

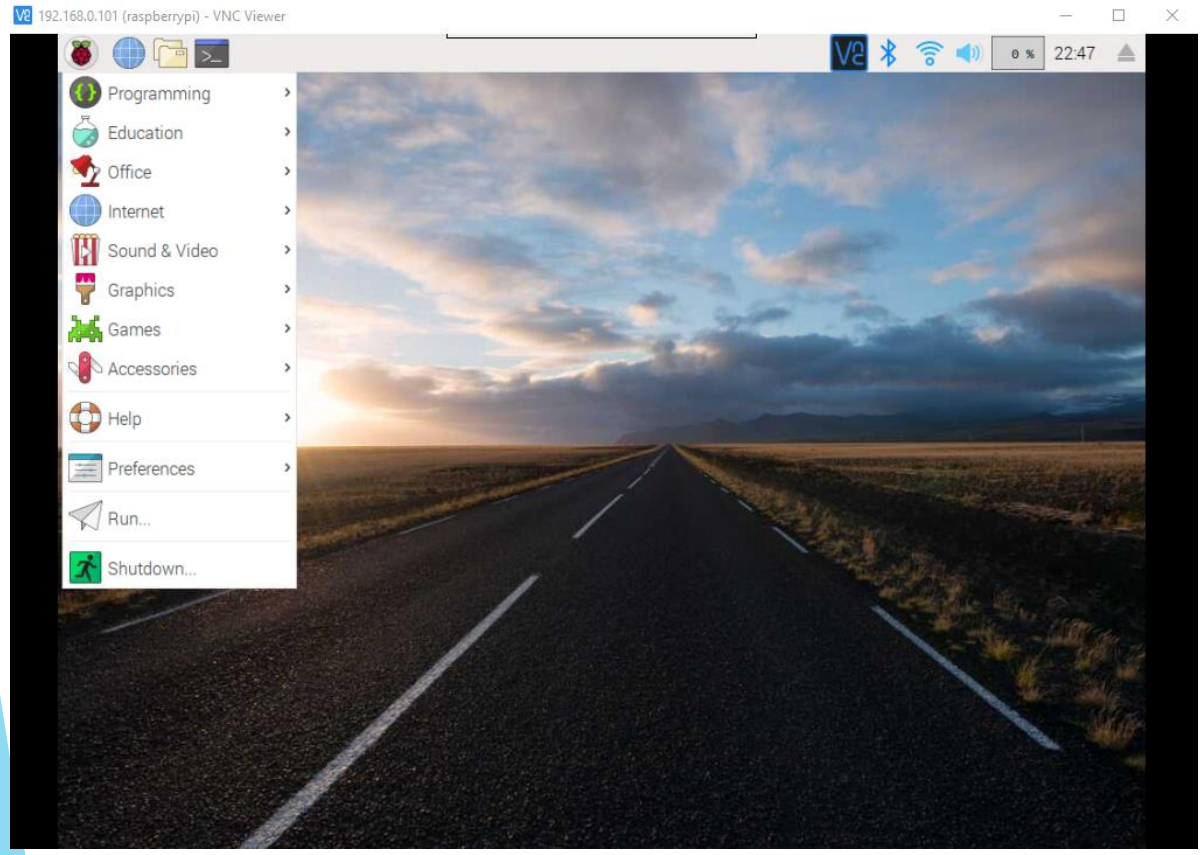
```
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1

network={
        ssid="YOUR_SSID"
        psk="YOUR_PASSWORD"
}
```

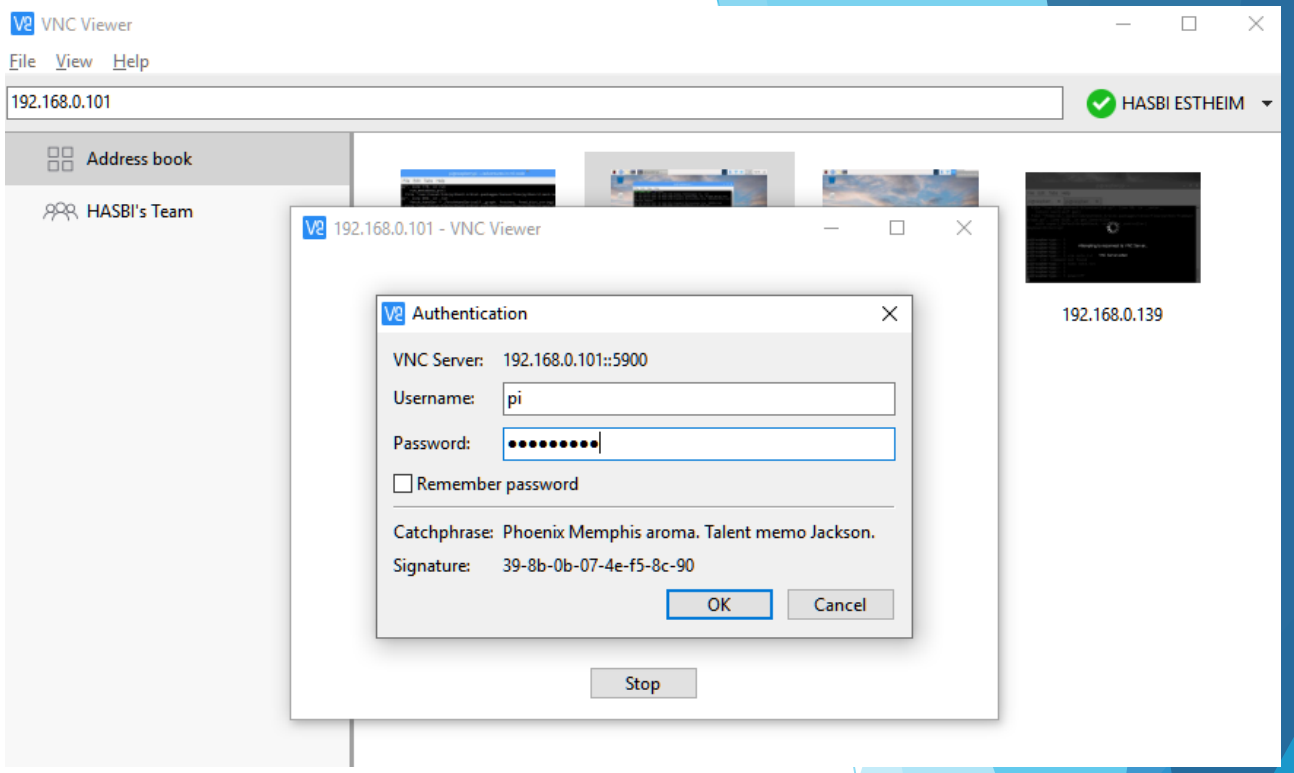
- Set Open and edit wpa_supplicant.conf
- Scan ip
- Ssh using putty

```
C:\Users\estheim>nmap -PN 192.168.0.1/24

Starting Nmap 7.60 ( https://nmap.org ) at 2019-08-04 22:36 SE Asia Standard Time
Nmap scan report for 192.168.0.101
Host is up (0.013s latency).
Not shown: 998 closed ports
PORT     STATE SERVICE
22/tcp   open  ssh
5900/tcp open  vnc
MAC Address: B8:27:EB:34:DB:6F (Raspberry Pi Foundation)
```

```
estheim@Machina:~$ ssh pi@192.168.0.101
pi@192.168.0.101's password:
Linux raspberrypi 4.14.79-v7+ #1159 SMP Sun Nov 4 17:50:20 GMT 2018 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Aug  4 22:40:41 2019 from 192.168.0.100
pi@raspberrypi:~ $ lsb_release -a
No LSB modules are available.
Distributor ID: Raspbian
Description:    Raspbian GNU/Linux 9.4 (stretch)
Release:        9.4
Codename:       stretch
pi@raspberrypi:~ $
```

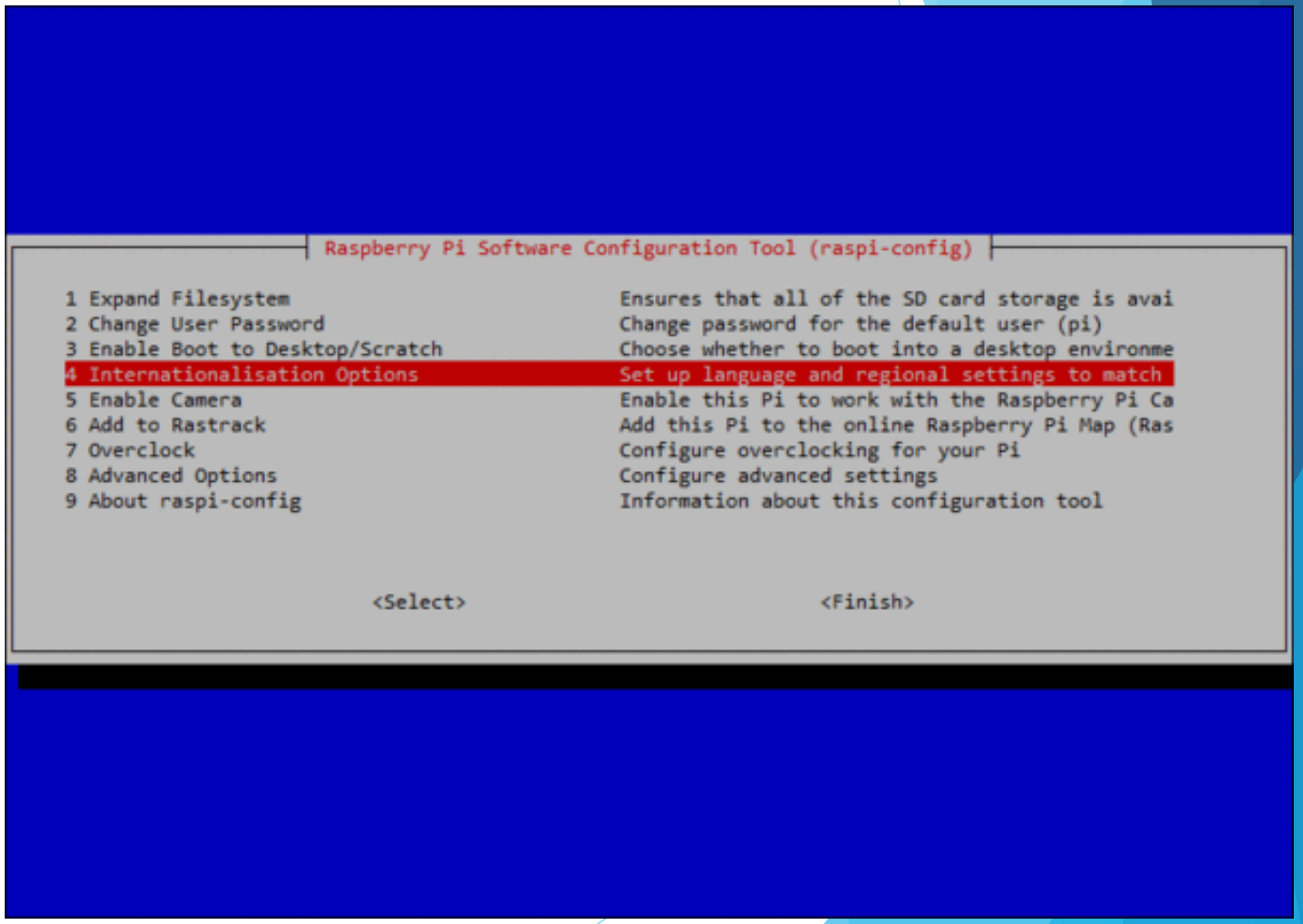
Remote desktop vnc





Raspi-config

- Sudo raspi-config



Introduction to python programming

- Open terminal type python

```
Python 3.6.2 |Continuum Analytics, Inc.| (default, Jul 20 2017, 12:30:02) [MSC v.1900 64 b
it (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>>
```

```
C:\Users\estheim>python
Python 2.7.16 (v2.7.16:413a49145e, Mar  4 2019, 01:37:19) [MSC v.1500 64 bit (AMD64)] on w
in32
Type "help", "copyright", "credits" or "license" for more information.
>>> exit()
```

Git clone https://github.com/hasbiida/TrainingEspRpi.git

Install library

- Pip3 install dash
- Pip3 install pysqlite3
- Pip3 install pandas

Dash is a Open Source Python library for creating reactive, Web-based applications

SQLite is the most used database engine in the world.

pandas providing high-performance, easy-to-use data structures and data analysis tools

Dash (Flask) Server

Run python3 App1.py

open in web browser change with raspi ip
http://192.168.0.106:8090/hello

```
 * Running on http://0.0.0.0:8090/ (Press CTRL+C to quit)
192.168.0.168 - - [05/Aug/2019 16:28:25] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:28:45] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:29:05] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:29:25] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:29:58] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:30:18] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:30:38] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:30:58] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:31:18] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:31:38] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:31:59] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:32:19] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:32:39] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:32:59] "GET /hello HTTP/1.1" 200 -
192.168.0.168 - - [05/Aug/2019 16:33:19] "GET /hello HTTP/1.1" 200 -
192.168.0.106 - - [05/Aug/2019 16:33:27] "GET /hello HTTP/1.1" 200 -
```

Dash with dummy data

- App2.py

```
(dash_flask) D:\github\trainingRpiESP>python App2.py
Running on http://0.0.0.0:8050/
Debugger PIN: 905-226-218
 * Serving Flask app "App2" (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: on
Running on http://0.0.0.0:8050/
Debugger PIN: 047-371-864
```

Reference

https://www.raspberrypi.org/documentation