Raspberry Pi Setup

(Raspberry Pi 4)

[PALLAV PRINCE]

YouTube Channel: https://www.youtube.com/ElectroPrince

Webpage: https://sites.google.com/view/pallavp

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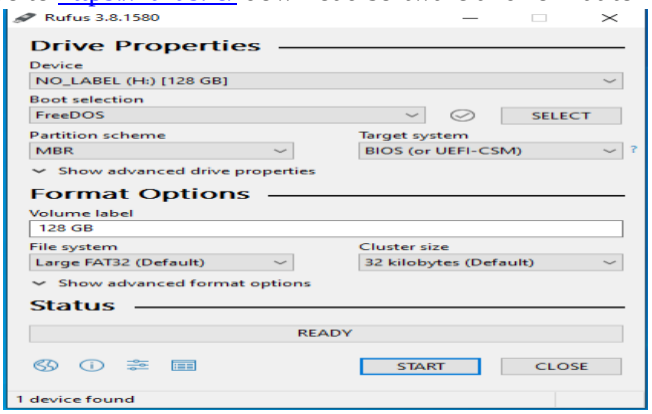
1. Formatting of SD card using FAT32 (Methode-1)

I. Format SD card using software from https://www.sdcard.org/downloads/formatter/ or

II. Go to https://rufus.ie/ download software and format to make FAT32



<Lable>
FreeDos
MBR
BIOS
Large FAT32

III. Copy unzipped NOOBS to SD Card https://www.raspberrypi.org/downloads/noobs/

IV. Insert SD card into Raspberry Pi board and power ON

V. Press and Hold Shift Key when Appear the Shift Button on Screen till open Installation window

VI. Connect internet (Wi-fi/Ethernet)

VII. Mark on Raspbian Full [RECOMMENDED] and ~~if you want other software then mark those software~~

VIII. Click on install and leave for successfully complete it will reboot and appear Welcome window

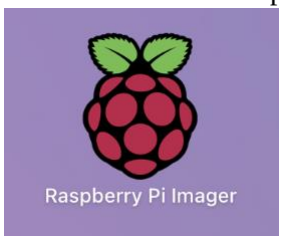
IX. Click on Next then select country, Language, Time Zone, and set Password (optional)

X. Connect internet (Wi-fi/Ethernet) and leave for update (Please wait for completion "System is up to date")

XI. Restart the System

2. OS install in Raspberry pi (Methode-2)

I. Download official Raspberry Pi imager



II. And keep at least **8 GB** micro-SD memory card (Card reader Adaptor is recommended) and format to FAT32 or Erase the card by Raspberry Pi imager

Follow the on-screen instructions. It may take around 1 hr.

III. After installing OS unmount the card from PC/Mac and insert in Raspberry Pi to start the raspberry Pi.

3. Screen configuration on Raspberry pi (SSH/ VNC/ DSI/ HDMI)

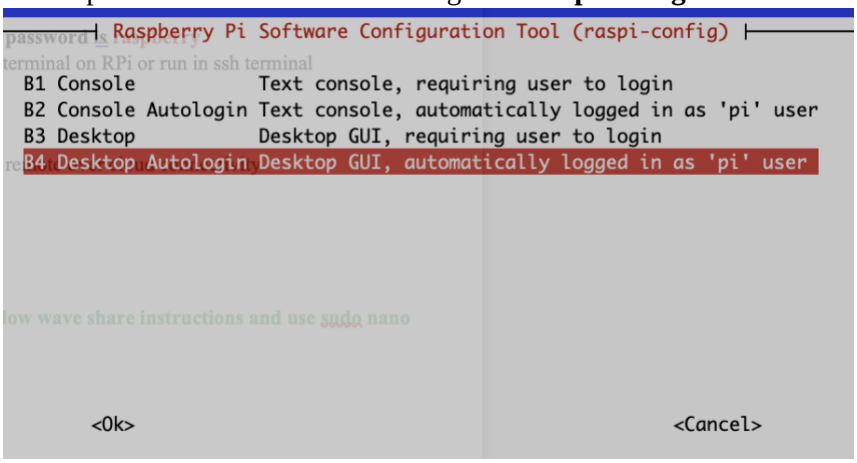
I. For SSH use "SSH" enable in interface menu

a. If Monitor or screen is not connected, then use SSH first time to set VNC or other option by boot SSH.
b. Shutdown Raspberry Pi and remove SD card from Board.
c. Insert SD card in PC/MAC (recommend use card Adaptor and put switch UP for unlock).
d. Go to SD card "boot" directory using file manager.
e. Create a new empty file named **ssh** without any extension, inside the boot directory (Open notebook and save empty file remove file extension).
f. Remove the SD card from your computer and put it in your Raspberry Pi.
g. Power on your Pi board.
h. On boot automatically Pi will check whether this file exists and if it does, SSH will be enabled, and the file is removed which created earlier.
i. Ensure IP address of Raspberry pi board (Prefer Ethernet connection so no need to additional configuration)
j. You may get IP address from Router admin
k. Login on Pi using ssh by
   i. **ssh <username>@<ip address> example: ssh pi@192.168.0.4**
   ii. if key warning appears and refuse connection on ssh then refresh the ssh key
   iii. To update the ssh key run command on host machine ssh-keygen -R <host ip> and then again run command on host machine for clint (RPI) key refresh, ssh-keygen -R <Raspberry pi ip> Example: **ssh-keygen -R 192.168.0.3**
   iv. Default username of Raspberry pi is **pi and password is raspberry**
   v. For Raspberry pi command line setup open terminal on RPi or run in ssh terminal **sudo raspi-config**

II. For VNC use "VNC" enable in interface menu

a. Use same user account in host as well as in clint for remote over cloud connectivity

b. Desktop mode and CLI mode set using **sudo raspi-config** Menu.



III. For DSI or HDMI use Screen configuration menu

a. Screen setting or resolution:
b. sudo raspi-config
c. HDMI-> Enable = Set resolution as per required
d. Composite-> Enable = Fix resolution
e. **For 2.8-inch 40 PIN GPIO wave share Screen follow wave share instructions and use sudo nano for file edit**

4. First time Configuration of Raspberry Pi

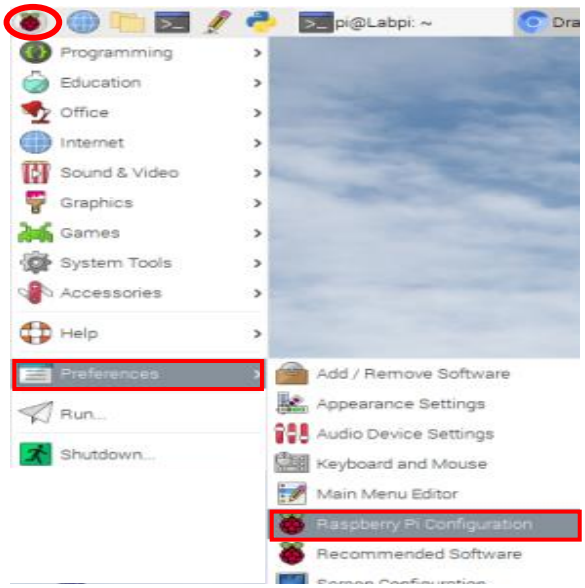
I. Open Terminal windows and run each code below:

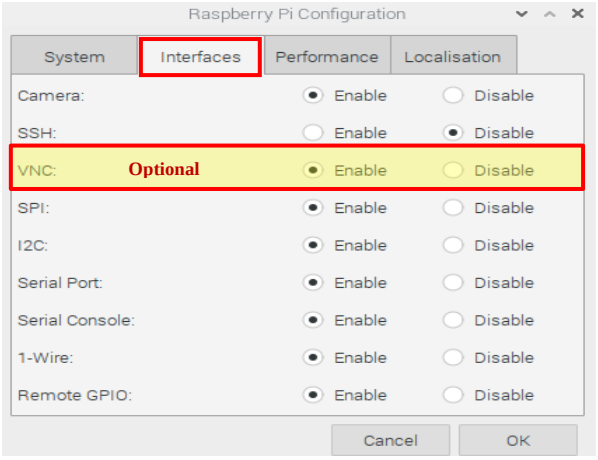
"**Don't run** these set of Code frequently if you are already configured or using Raspberry Pi"

"if any code returns error, then ignore that code and proceed to next task"

(a) sudo apt-get update
(b) sudo apt-get upgrade
(c) sudo apt-get dist-upgrade
(d) sudo reboot
(e) sudo apt-get update
(f) sudo apt-get upgrade
(g) sudo rpi-update
(h) sudo apt install rpi-eeprom
(i) sudo reboot
(j) sudo apt-get clean
(k) sudo reboot

II. Configuration Settings of Raspberry Pi:





5. Task During Use of Raspberry Pi

I. Open Terminal Windows and run code Time to time

(a) sudo pip install --upgrade pip
(b) sudo pip3 install --upgrade pip
(c) sudo apt-get update
(d) sudo apt-get upgrade
(e) sudo apt-get dist-upgrade
(f) sudo reboot

6. Installation of Python and its library on Raspberry Pi

I. Open Terminal Windows and run Code
"if any code returns error, then ignore that code and proceed to next task"

(a) sudo apt-get update
(b) sudo apt install python3 idle3
(c) sudo pip3 install pip
(d) sudo pip install pip
(e) sudo pip install pip3
(f) sudo pip3 install pip3
(g) sudo pip install --upgrade pip
(h) sudo pip3 install --upgrade pip
(i) sudo pip list
(j) sudo pip3 list
(k) sudo pip3 install guizero
(l) sudo pip3 install gpiozero
(m) sudo pip install pip guizero
(n) sudo pip install pip gpiozero
(o) sudo pip install pip pytest-shutil
(p)

➢ For uninstall any individual module sudo pip3 uninstall <name of module>

7. Raspberry Pi System Operation on Root

I. Open Terminal Windows and run code for set file or folder permission

(a) Connect the screen
(b) sudo chmod *** /<path>

(c) sudo chmod 777 /etc/rc.local

(d) sudo chmod 777 /sys/devices/platform/rpi_backlight/backlight/rpi_backlight/brightness

"First connect RPi Official Screen to control Brightness and after connecting the RPi official Screen all backlight folder Auto installed in System. If Screen is not connected then Brightness folder **not** show. **External Display** brightness **not** control by this method"

There are three Classes – Owner, Group, Others
0 – no permission || 1 – execute || 2 – write || 3 – write and execute || 4 – read
5 – read and execute || 6 – read and write || 7 – read, write, and execute
#755 – This set of permission is commonly used in web server permissions to read, write and execute
#777 – Everyone can read write and execute. In a web server, it is not advisable to set '777'
#644 – Only the owner can read and write. Everyone else can only read. No one can execute the file.
#link for reference "sudo chmod" https://www.maketecheasier.com/file-permissions-what-does-chmod-777-means/

II. Add command line to <rc.local> to run code on **bootup** of the raspberry pi
path Location of Terminal file </etc/rc.local>

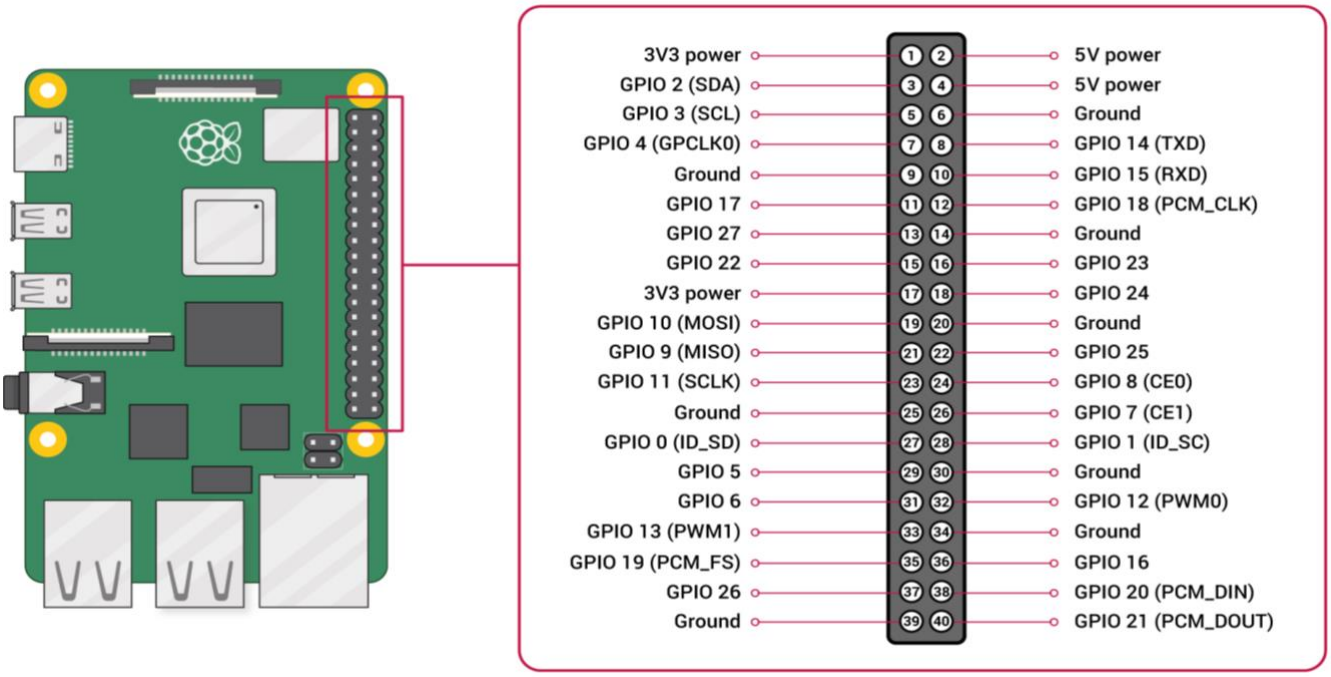
```
#
# By default this script does nothing.
#
#Command writen by ElectroPrince in order to run these command in boot up

# "sudo chmod" to give permission of brightness setting file to anyone
sudo chmod --preserve-root 777 /sys/class/backlight/rpi_backlight/brightness

# Update command for check and install any update on Raspberry Pi
sudo apt-get update
#

# Print the IP address
```

8. Raspberry Pi 4 PIN OUT



Some Quick Note on command line for Raspberry Pi

sudo apt-get update
sudo apt-get dist-upgrade ****Single time only

sudo apt-get update
sudo apt-get -y dist-upgrade**** never

sudo apt-get update
sudo apt-get upgrade
sudo reboot

sudo apt install python3 idle3

sudo pip3 install name_of_module

pip3 install name_of_module. Wwwwwww

pip3 install --upgrade name_of_module

Pip3 list

chmod 777 / <path>
sudo 777 /<path>

Screen setting or resolution:
sudo raspi-config
HDMI-> Enable = Set resolution as per required
Composite-> Enable = Fix resolution

*****_____*****_____
Connect raspberry pi on SSH network

Test first
ping <ip>
ssh pi@192.xxxx.xxx.xx

Raspberry user name "pi"
Default Password: raspberry
sudo raspi-config

*****_____*****_____

*****
Task During Use of Raspberry Pi
Open Terminal Windows and run code Time to time
sudo pip install --upgrade pip
sudo pip3 install --upgrade pip
sudo apt-get update
sudo apt-get upgrade
sudo reboot
*****
Initialization of R Pi
Open Terminal windows and run each code below:

\u201cDon\u2019t run these set of Code frequently"
\u201cif any code returns error, then ignore that code"

sudo apt-get update
sudo apt-get upgrade
sudo apt full-upgrade
sudo reboot

sudo apt-get dist-upgrade Danger
sudo apt-get update
sudo apt-get upgrade
sudo rpi-update very danger pre-releas
sudo apt-get clean
sudo reboot

*****
If you have done an rpi-update and things are not working as you wish, if your Raspberry Pi is still bootable you can return to the stable release using:

sudo apt-get update
**sudo apt install --reinstall libraspberrypi0 libraspberrypi-{bin,dev,doc} raspberrypi-bootloader raspberrypi-kernel
*****
Installation of Python and its library on Raspberry Pi
Open Terminal Windows and run Code

sudo apt-get update
sudo apt install python3 idle3
sudo pip3 install pip
sudo pip install pip
sudo pip install pip3
sudo pip3 install pip3
sudo pip install --upgrade pip
sudo pip3 install --upgrade pip
sudo pip list
sudo pip3 list
sudo pip3 install guizero
sudo pip3 install gpiozero
sudo pip install pip guizero
sudo pip install pip gpiozero
sudo pip install pip pytest-shutil

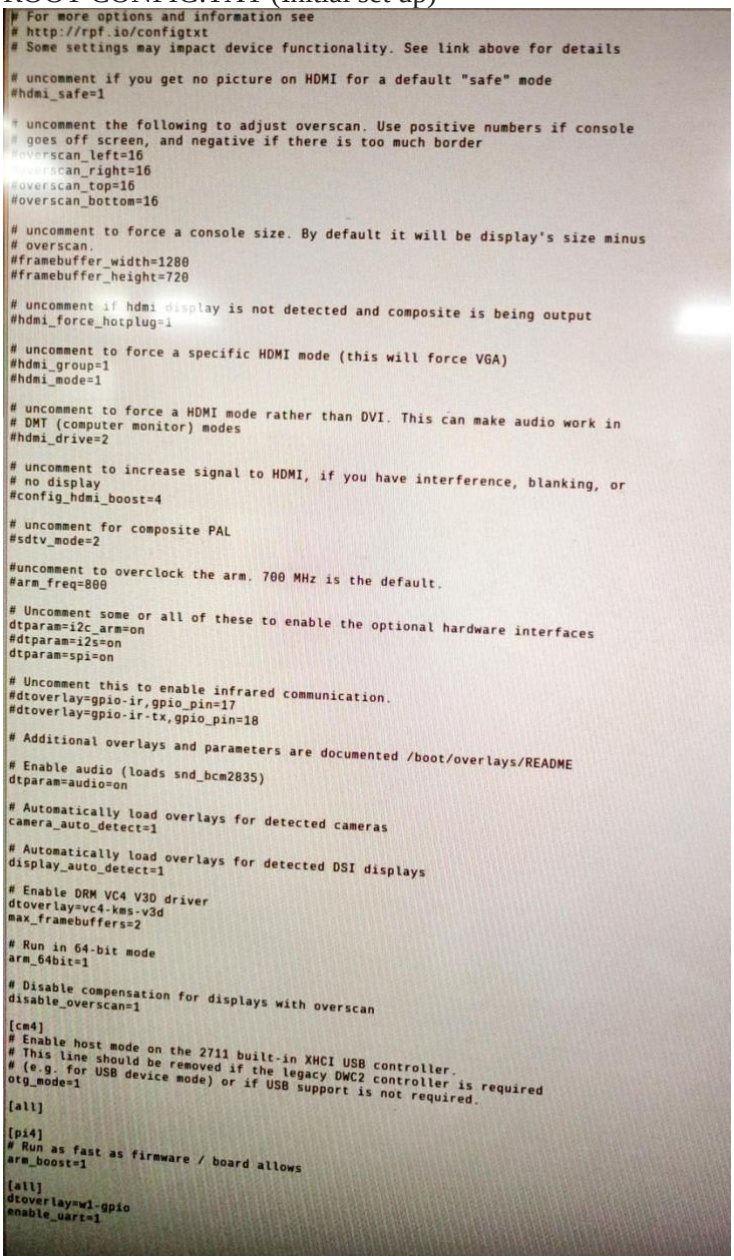
For uninstall any individual module sudo pip3 uninstall <name of module>

*****
For set file or folder permission
Connect the screen
sudo chmod *** /<path>

*****
RPi screen Britness control, NOT Use for EXTERNAL SCREEN"
sudo chmod 777 /etc/rc.local
sudo chmod 777 /sys/devices/platform/rpi_backlight/backlight/rpi_backlight/brightness
*****
Downloaded package files (.deb files) are kept in /var/cache/apt/archives
Remove these in order to free up space with

```
sudo apt clean
sudo apt-get clean
```

Bonus:
ROOT CONFIG.TXT (Initial set up)



```
# For more options and information see
# http://rpf.io/configtxt
# Some settings may impact device functionality. See link above for details

# uncomment if you get no picture on HDMI for a default "safe" mode
#hdmi_safe=1

# uncomment the following to adjust overscan. Use positive numbers if console
# goes off screen, and negative if there is too much border
#overscan_left=16
#overscan_right=16
#overscan_top=16
#overscan_bottom=16

# uncomment to force a console size. By default it will be display's size minus
# overscan.
#framebuffer_width=1280
#framebuffer_height=720

# uncomment if hdmi display is not detected and composite is being output
#hdmi_force_hotplug=1

# uncomment to force a specific HDMI mode (this will force VGA)
#hdmi_group=1
#hdmi_mode=1

# uncomment to force a HDMI mode rather than DVI. This can make audio work in
# DMT (computer monitor) modes
#hdmi_drive=2

# uncomment to increase signal to HDMI, if you have interference, blanking, or
# no display
#config_hdmi_boost=4

# uncomment for composite PAL
#sdtv_mode=2

#uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800

# Uncomment some or all of these to enable the optional hardware interfaces
dtparam=i2c_arm=on
#dtparam=i2s=on
dtparam=spi=on

# Uncomment this to enable infrared communication.
#dtoverlay=gpio-ir,gpio_pin=17
#dtoverlay=gpio-ir-tx,gpio_pin=18

# Additional overlays and parameters are documented /boot/overlays/README

# Enable audio (loads snd_bcm2835)
dtparam=audio=on

# Automatically load overlays for detected cameras
camera_auto_detect=1

# Automatically load overlays for detected DSI displays
display_auto_detect=1

# Enable DRM VC4 V3D driver
dtoverlay=vc4-kms-v3d
max_framebuffers=2

# Run in 64-bit mode
arm_64bit=1

# Disable compensation for displays with overscan
disable_overscan=1

[cm4]
# Enable host mode on the 2711 built-in XHCI USB controller.
# This line should be removed if the legacy DWC2 controller is required
# (e.g. for USB device mode) or if USB support is not required.
otg_mode=1

[all]

[pi4]
# Run as fast as firmware / board allows
arm_boost=1

[all]
dtoverlay=w1-gpio
enable_uart=1
```