

Install Raspbian on Raspberry Pi 3

1. Assume that you are using Linux. First, download Raspbian Image.
 - 1) Go to <https://www.raspberrypi.org/downloads/raspbian/>
 - 2) Download the latest **RASPBIAN STRETCH WITH DESKTOP** image.
 - a. Important: **do not** choose a **Lite** version, where lots of useful components are not included.
2. Unzip the Raspbian image like below:
(Assume that the image is in 'Downloads' directory. File name can be different.)

```
$ cd ~/Downloads  
$ unzip ./2018-06-27-raspbian-stretch.zip
```
3. Insert the microSD Card in your RPi kit to your laptop PC.
4. Copy Raspbian image to the SD-Card with 'dd' command. The below guide is from:
<https://www.raspberrypi.org/documentation/installation/installing-images/linux.md>

* For MacOS users, please follow below link:
<https://www.raspberrypi.org/documentation/installation/installing-images/mac.md>

Note: use of the dd tool can overwrite any partition of your machine. If you specify the wrong device in the instructions below, you could delete your primary Linux partition. Please be careful.

DISCOVERING THE SD CARD MOUNTPPOINT AND UNMOUNTING IT

- Run `df -h` to see which devices are currently mounted.
- If your computer has a slot for SD cards, insert the card. If not, insert the card into an SD card reader, then connect the reader to your computer.
- Run `df -h` again. The new device that has appeared is your SD card. If no device appears, then your system is not automounting devices. In this case, you will need to search for the device name using another method. The `dmesg | tail` command will display the most recent system messages, which should contain information on the naming of the SD card device. The naming of the device will follow the format described in the next paragraph. Note that if the SD card was not automounted, you do not need to unmount later.

- The left column of the results from `df -h` command gives the device name of your SD card. It will be listed as something like `/dev/mmcblk0p1` or `/dev/sdX1`, where X is a lower case letter indicating the device. The last part (p1 or 1 respectively) is the partition number. You want to write to the whole SD card, not just one partition. You therefore need to remove that section from the name. You should see something like `/dev/mmcblk0` or `/dev/sdX` as the device name for the whole SD card. Note that the SD card can show up more than once in the output of `df`. It will do this if you have previously written a Raspberry Pi image to this SD card, because the Raspberry Pi SD images have more than one partition.
- Now you have noted the device name, you need to unmount it so that files can't be read or written to the SD card while you are copying over the SD image.
- Run `umount /dev/sdX1`, replacing `sdX1` with whatever your SD card's device name is, including the partition number.
- If your SD card shows up more than once in the output of `df`, this shows that the card has multiple partitions. You should unmount all of these partitions.

COPYING THE IMAGE TO THE SD CARD

- In a terminal window, write the image to the card with the command below, making sure you replace the input file `if=` argument with the path to your `.img` file, and the `/dev/sdX` in the output file `of=` argument with the correct device name. This is very important, as you will lose all the data on the hard drive if you provide the wrong device name. Make sure the device name is the name of the whole SD card as described above, not just a partition. For example: `sdd`, not `sdds1` or `sddp1`, and `mmcblk0`, not `mmcblk0p1`.
- `dd bs=4M if=2018-06-27-raspbian-stretch.img of=/dev/sdX conv=fsync`
- Please note that block size set to 4M will work most of the time. If not, try 1M, although this will take considerably longer.
- Also note that if you are not logged in as root you will need to prefix this with `sudo`.
- Run `sync`. This will ensure the write cache is flushed and that it is safe to unmount your SD card.
- Remove the SD card from the card reader.

5. Boot raspberry pi with SD-Card. If you connect your RPi to a monitor using an HDMI cable,
(For the first time boot, it will automatically compose its partition for root filesystem. So wait enough (e.g. 1 min) for the process.)
6. Insert SD-Card in your laptop

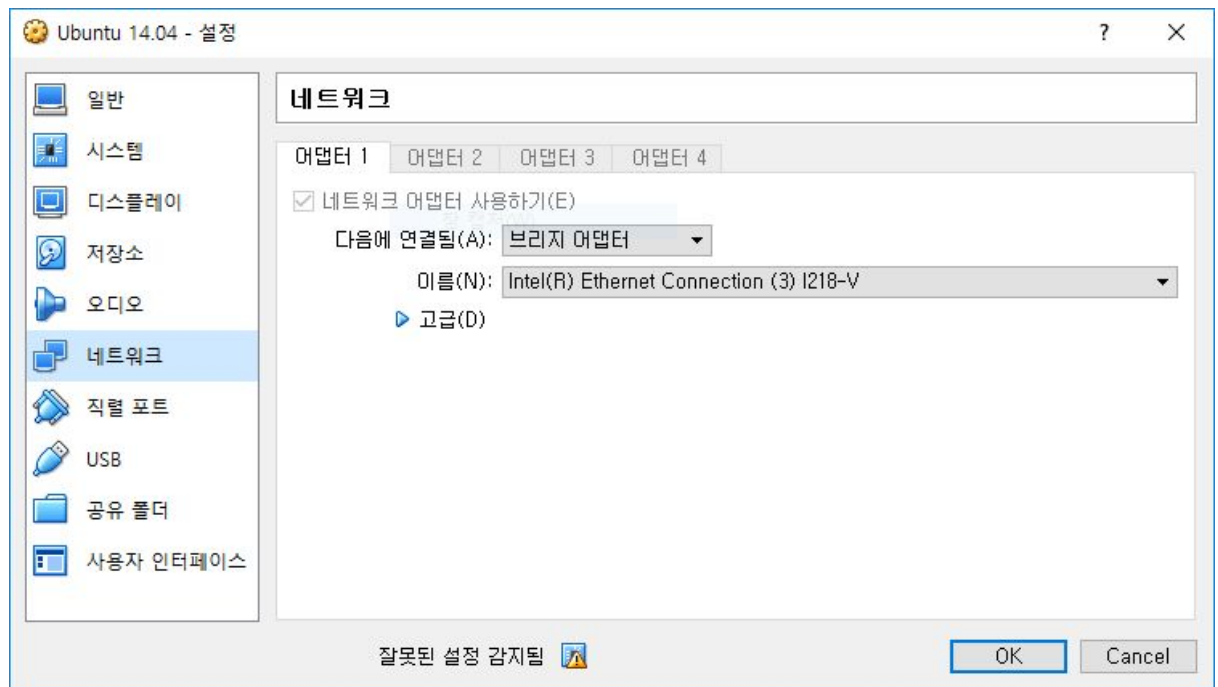
7. Check if SD-Card is mounted on your laptop. If not, maybe you did something wrong. So Please try again.
8. Open '/etc/default/keyboard' file with privileged which is located in the SD-Card's root filesystem (not your laptop's root filesystem), and replace the value of "XKBLAYOUT" from "gb" to "us".
9. type '**touch ssh**' in SD-Card's boot partition to create file named 'ssh' which enables ssh for your Raspbian.
10. Open '/etc/network/interfaces' file with privileged which is located in the SD-Card's root filesystem (not your laptop's root filesystem), and replace contents as below.

```
auto eth0
allow-hotplug eth0
iface eth0 inet static
address 192.168.1.1
netmask 255.255.255.0
gateway 192.168.1.1
```

11. Open '/etc/network/interfaces' file with privileged which is located in your laptop's root filesystem (not the SD-Card's root filesystem), and replace contents as below.

```
auto eth0
allow-hotplug eth0
iface eth0 inet static
address 192.168.1.2
netmask 255.255.255.0
gateway 192.168.1.1
```

12. **[Only for the students who are using Virtual Box]** Change the network setting as below. You can easily find this window in "장치 -> 네트워크 -> 네트워크 설정".



13. Connect laptop and raspberry pi with ethernet cable, boot raspberry pi3, and reboot your laptop. (or Virtual Box)



14. run `ssh pi@192.168.1.1` in laptop
(password) : raspberry
15. change password:

[Assignment]

- Compile and execute a 'hello world' program in raspberry pi through ssh by using your laptop. You may use any of your preferred languages like C, java, or python.
- Submit a screenshot to the below link:
 - <https://goo.gl/13pDWU>
- Please note that, in order to open the above link, you should first log in using your gmail account, or KMU email (OOO@kookmin.ac.kr) at <http://apps.kookmin.ac.kr> .
- Submission due: Sept. 11, 23:59