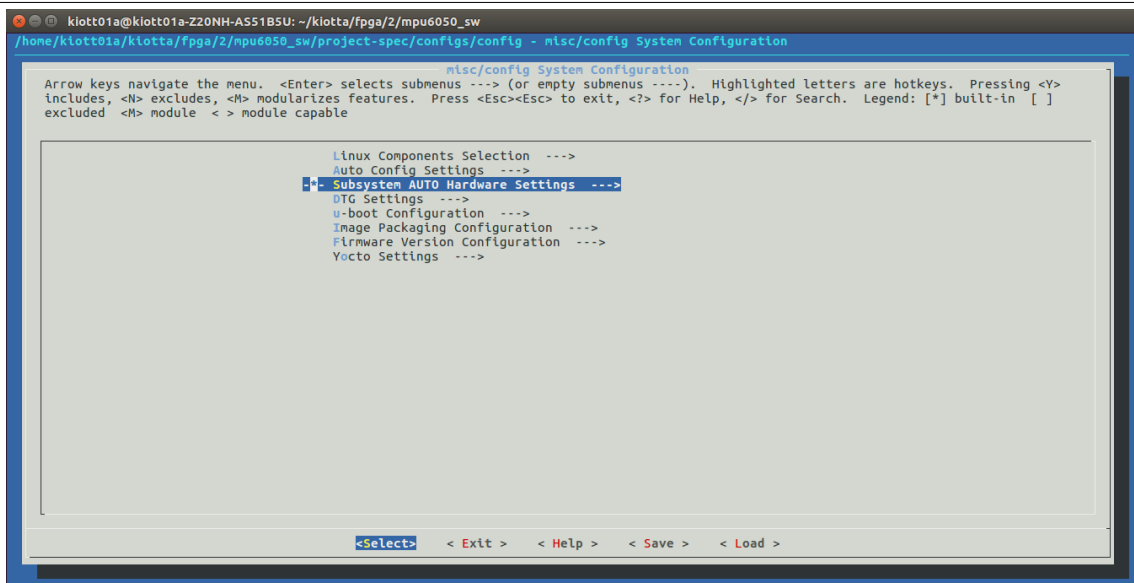


1. petalinux 생성

```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2$ petalinux-create -t project -n mpu6050_sw --template zynq
INFO: Create project: mpu6050_sw
INFO: New project successfully created in /home/kiott01a/kiotta/fpga/2/mpu6050_sw
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2$ ls
mpu6050_sw
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2$
```

2. 부트 모드 설정

```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2/mpu6050_sw
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw$ petalinux-config --get-hw-description=../mpu6050_hw/mpu6050_hw.sdk
```



```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2/mpu6050_sw
/home/kiott01a/kiotta/fpga/2/mpu6050_sw/project-spec/configs/config - misc/config System Configuration
→Subsystem AUTO Hardware Settings

Subsystem AUTO Hardware Settings
System Processor (ps7_cortexa9_0) --->
Memory Settings --->
Serial Settings --->
Ethernet Settings --->
Flash Settings --->
SD/SDIO Settings --->
RTC Settings --->
[*] Advanced bootable images storage Settings --->

[Select] < Exit > < Help > < Save > < Load >
```

```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2/mpu6050_sw
/home/kiott01a/kiotta/fpga/2/mpu6050_sw/project-spec/configs/config - misc/config System Configuration
→Subsystem AUTO Hardware Settings →Advanced bootable images storage Settings

Advanced bootable images storage Settings
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]
excluded <M> module < > module capable

--- Advanced bootable images storage Settings
boot image settings --->
u-boot env partition settings --->
kernel image settings --->
jffs2 rootfs image settings --->
dtb image settings --->

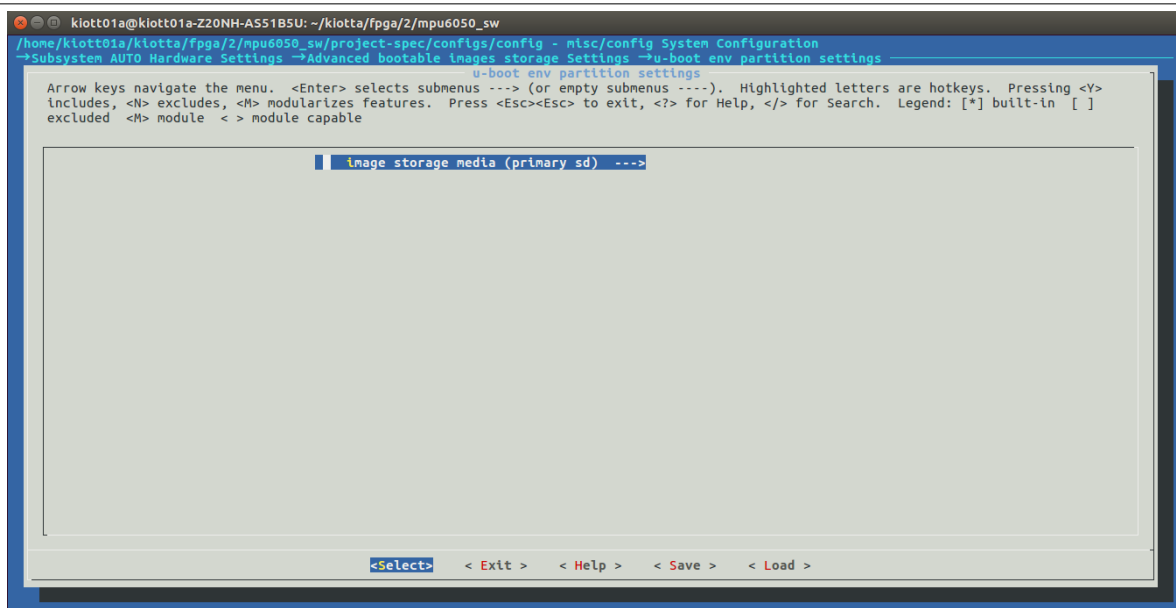
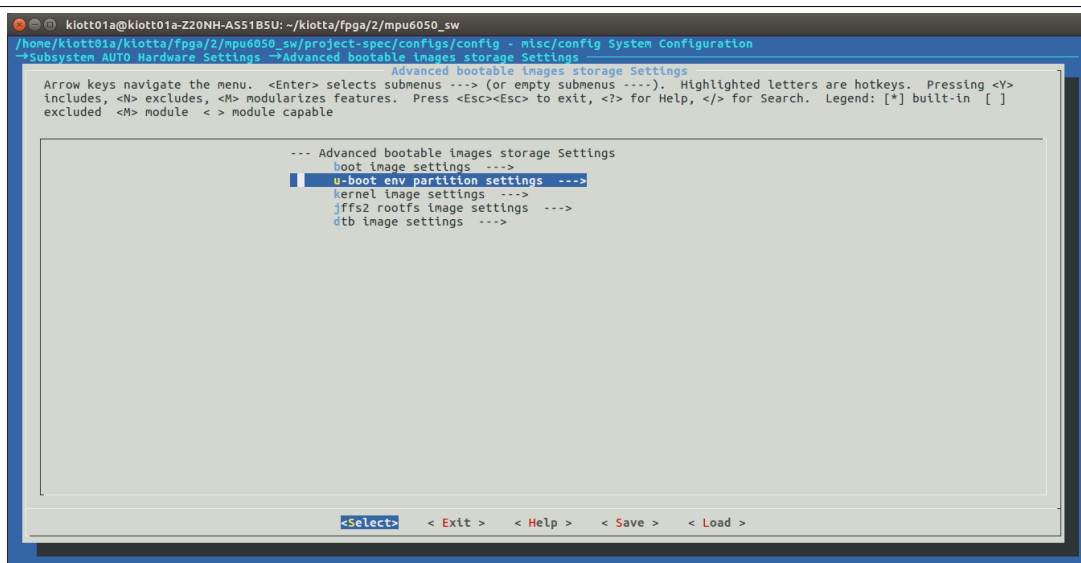
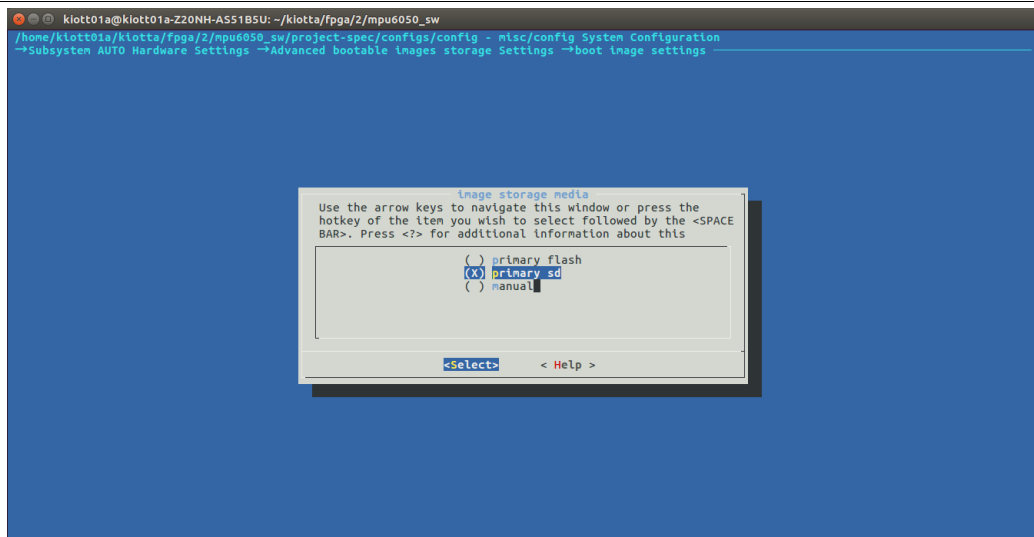
[Select] < Exit > < Help > < Save > < Load >
```

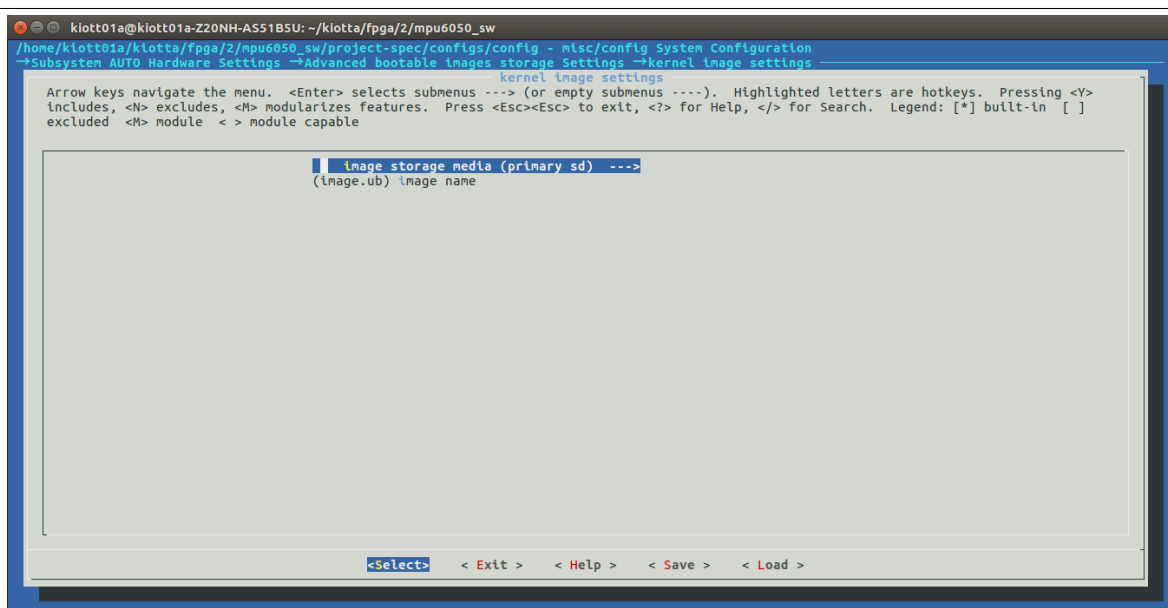
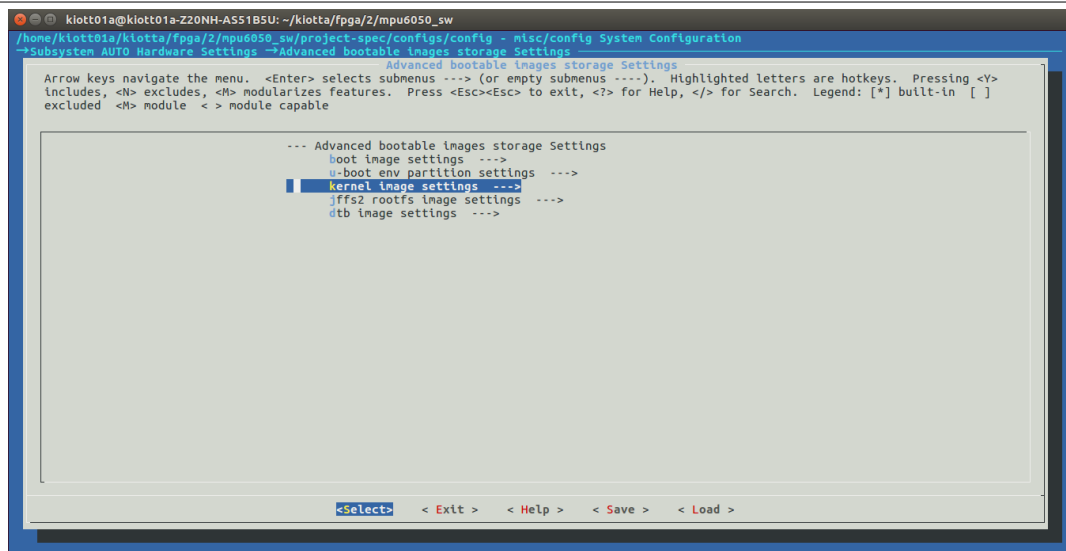
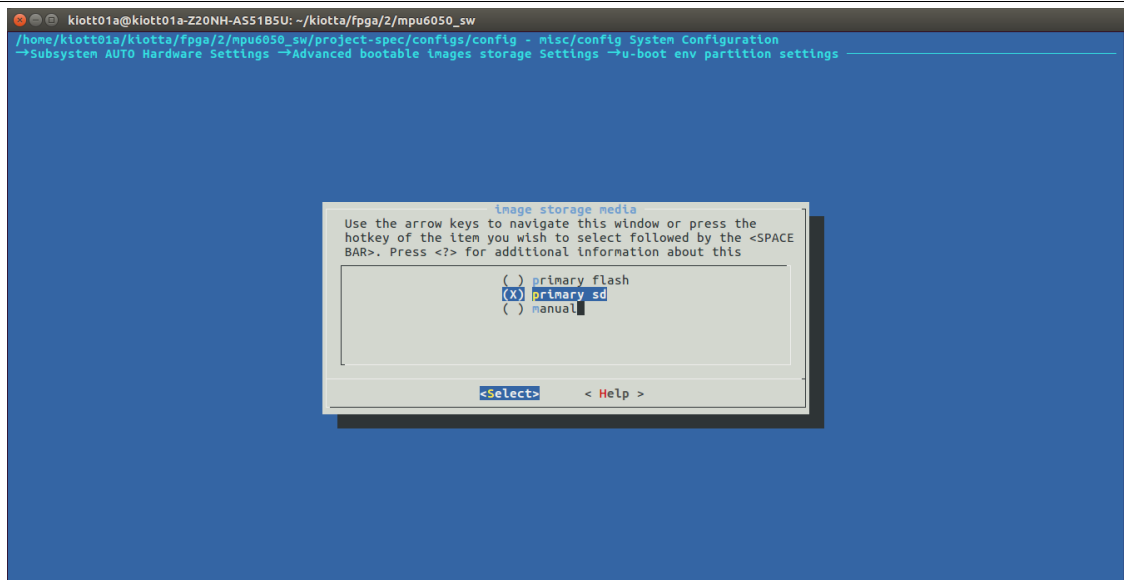
```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2/mpu6050_sw
/home/kiott01a/kiotta/fpga/2/mpu6050_sw/project-spec/configs/config - misc/config System Configuration
→Subsystem AUTO Hardware Settings →Advanced bootable images storage Settings →boot image settings

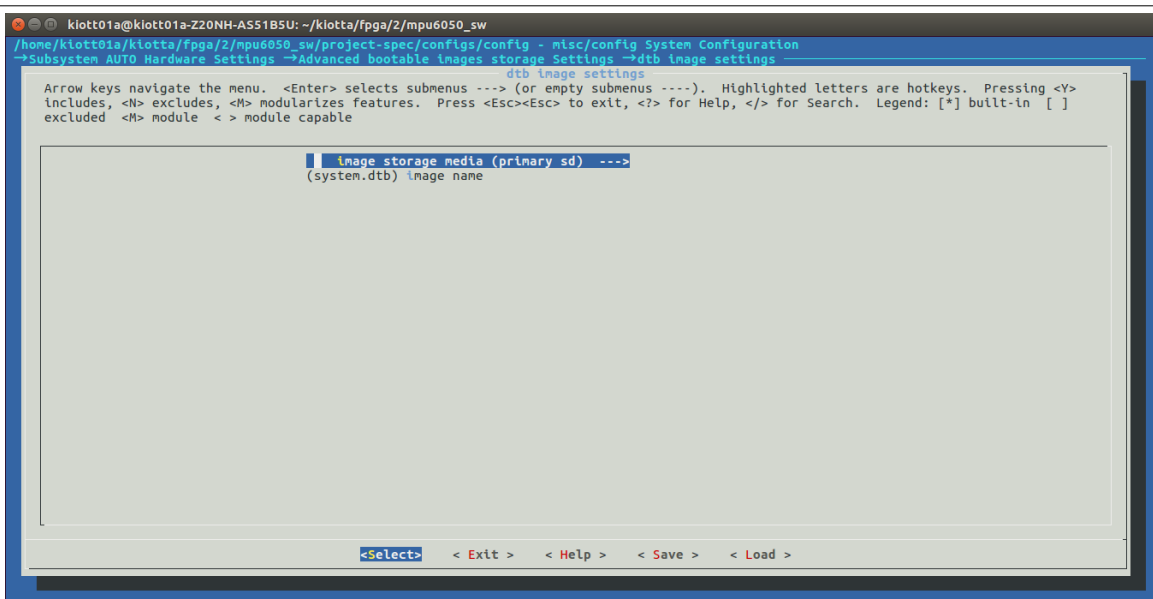
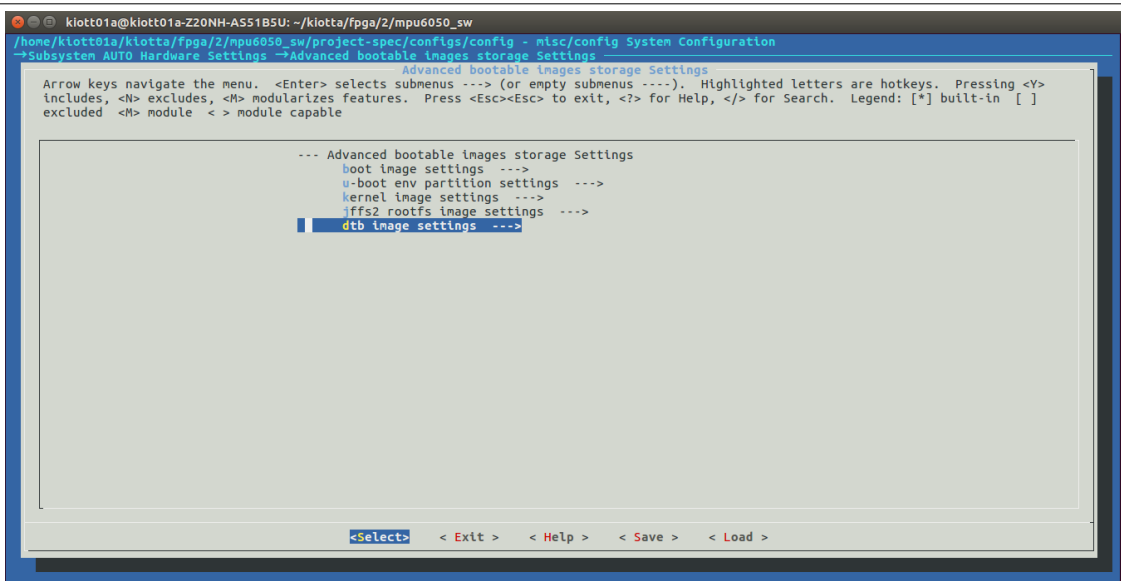
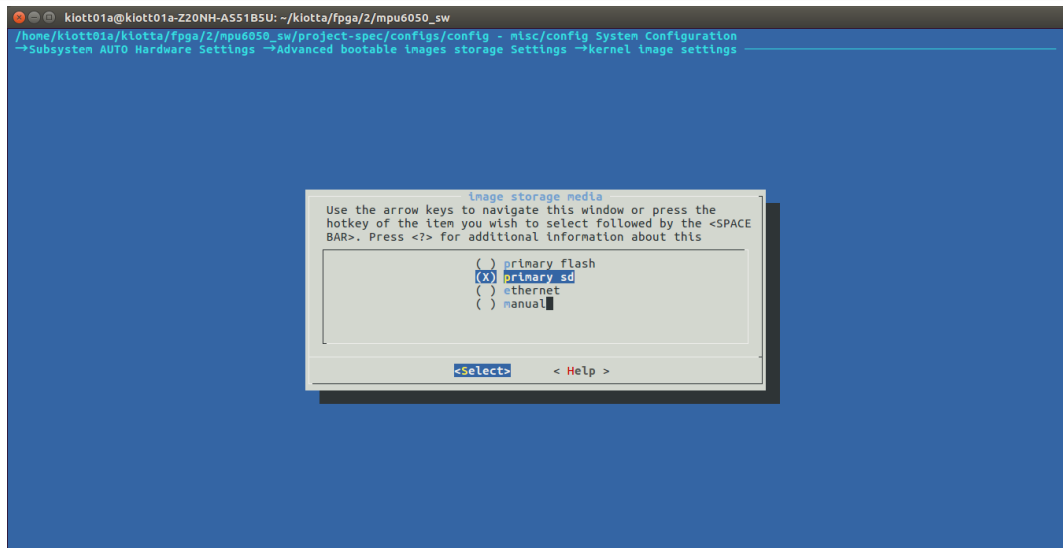
boot image settings
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]
excluded <M> module < > module capable

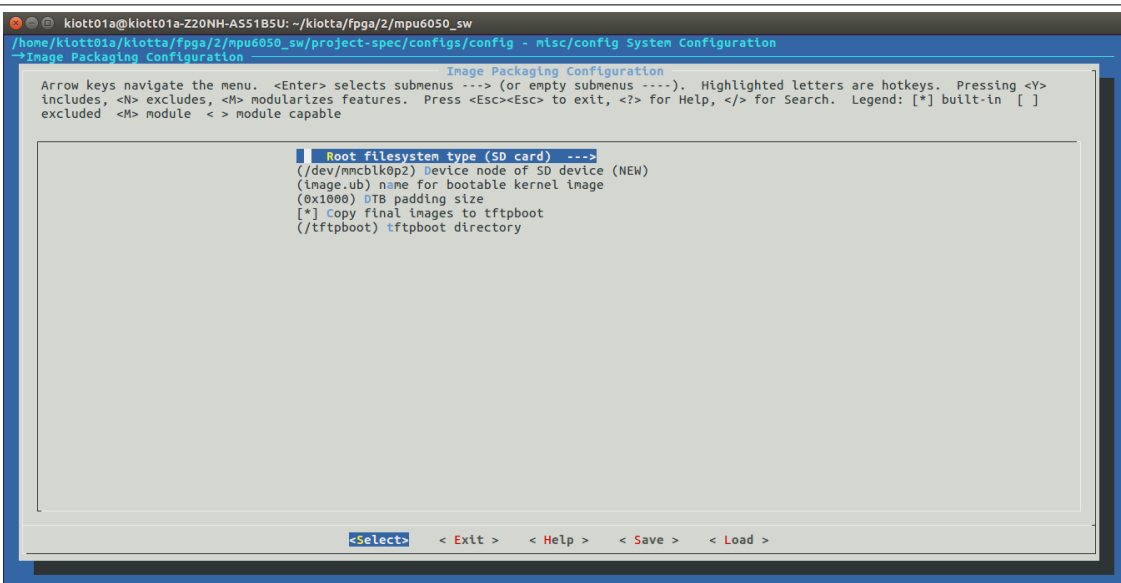
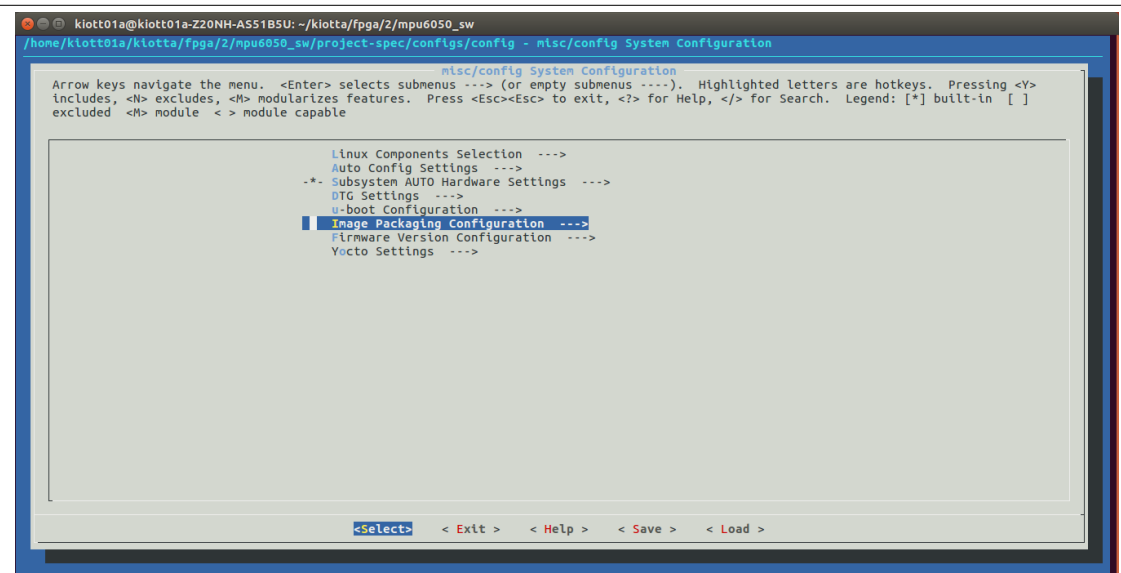
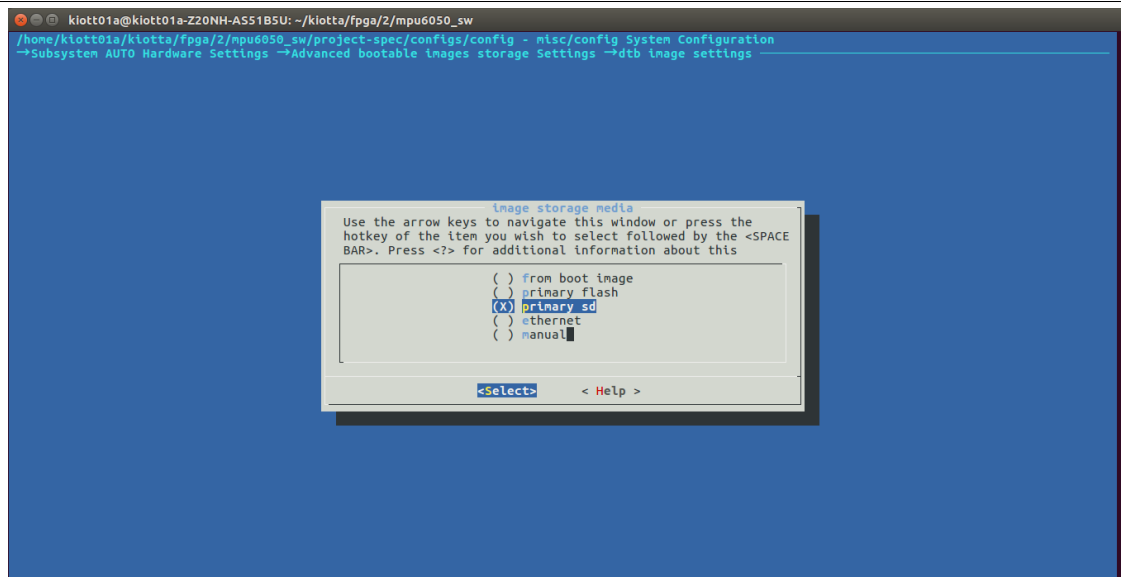
image storage media (primary sd) --->
(BOOT.BIN) image name

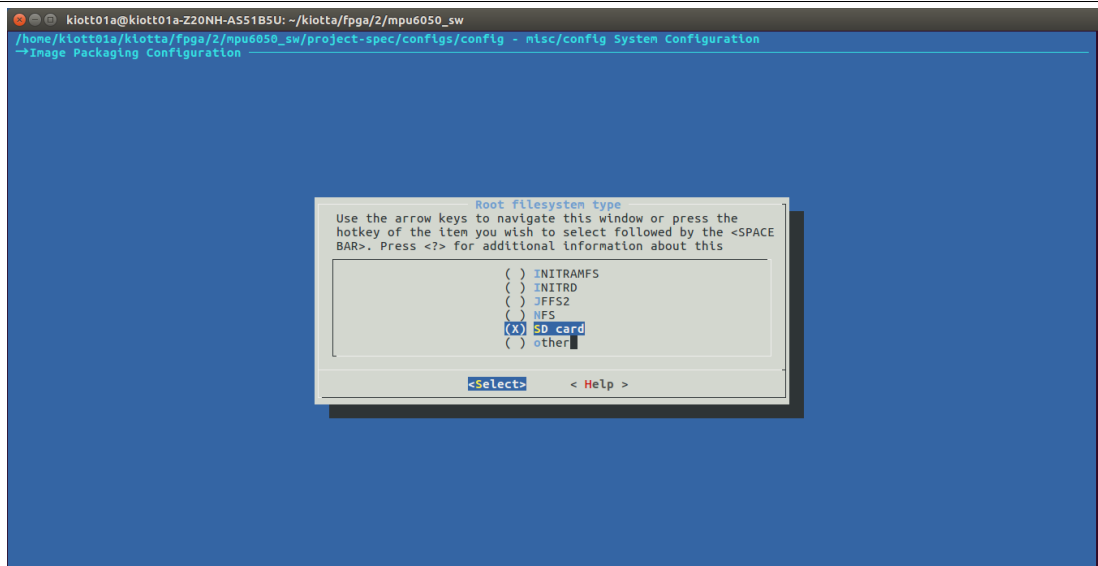
[Select] < Exit > < Help > < Save > < Load >
```











위와 같이 설정 후 home 창으로 돌아와서 save 후 exit 한다.
설정이 완료되면 아래와 같은 창이 뜬다.

```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2/mpu6050_sw
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw$ petalinux-config --get-hw-description=../mpu6050_hw/mpu6050_hw.sdk
INFO: Getting hardware description...
INFO: Rename i2c_mpu6050_wrapper.hdf to system.hdf
[INFO] generating Kconfig for project

[INFO] menuconfig project
/home/kiott01a/kiotta/fpga/2/mpu6050_sw/build/misc/config/Kconfig.syshw:30:warning: defaults for choice values not supported
/home/kiott01a/kiotta/fpga/2/mpu6050_sw/build/misc/config/Kconfig:568:warning: config symbol defined without type

*** End of the configuration.
*** Execute 'make' to start the build or try 'make help'.

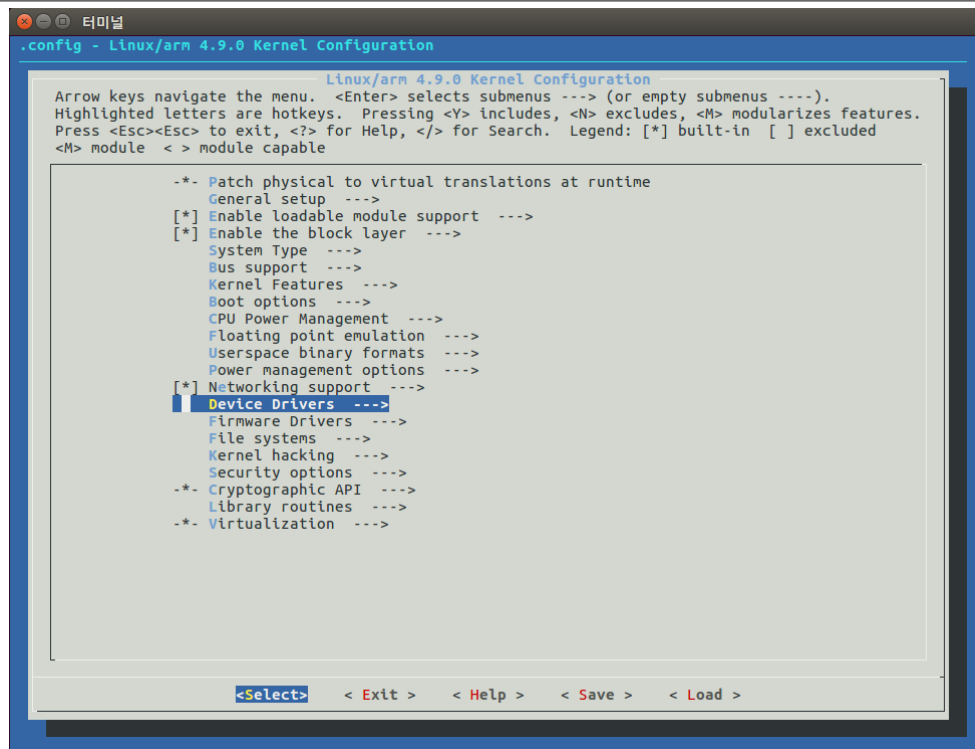
[INFO] sourcing bitbake
[INFO] generating plnxtool conf
[INFO] generating meta-plnx-generated layer
~/kiotta/fpga/2/mpu6050_sw/build/misc/plnx-generated ~/kiotta/fpga/2/mpu6050_sw
~/kiotta/fpga/2/mpu6050_sw
[INFO] generating machine configuration
[INFO] generating bbappends for project . This may take time !
~/kiotta/fpga/2/mpu6050_sw/build/misc/plnx-generated ~/kiotta/fpga/2/mpu6050_sw
~/kiotta/fpga/2/mpu6050_sw
[INFO] generating u-boot configuration files

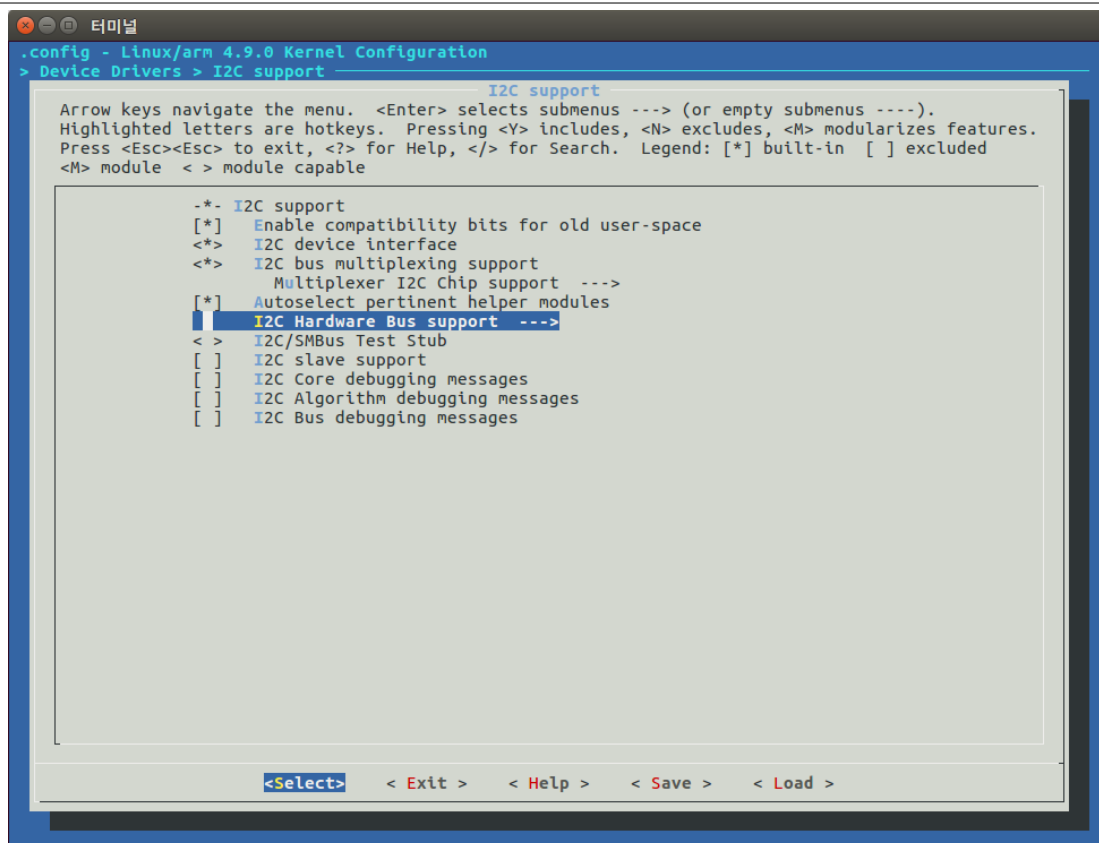
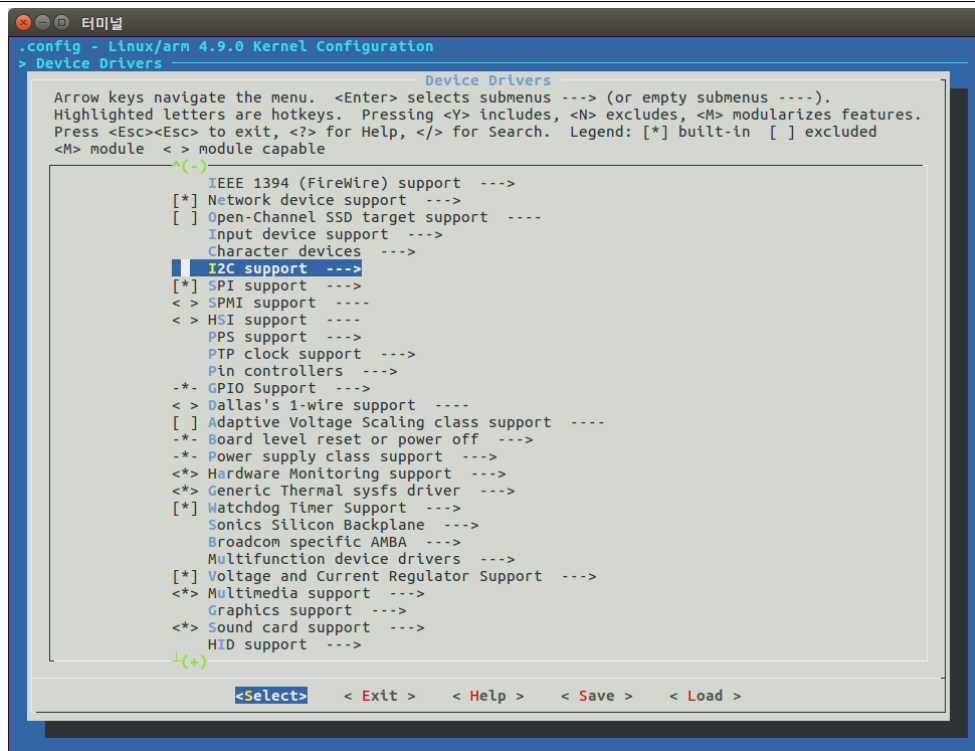
[INFO] generating kernel configuration files
[INFO] generating kconfig for Rootfs
Generate rootfs kconfig
[INFO] oldconfig rootfs
[INFO] generating petalinux-user-image.bb
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw$
```

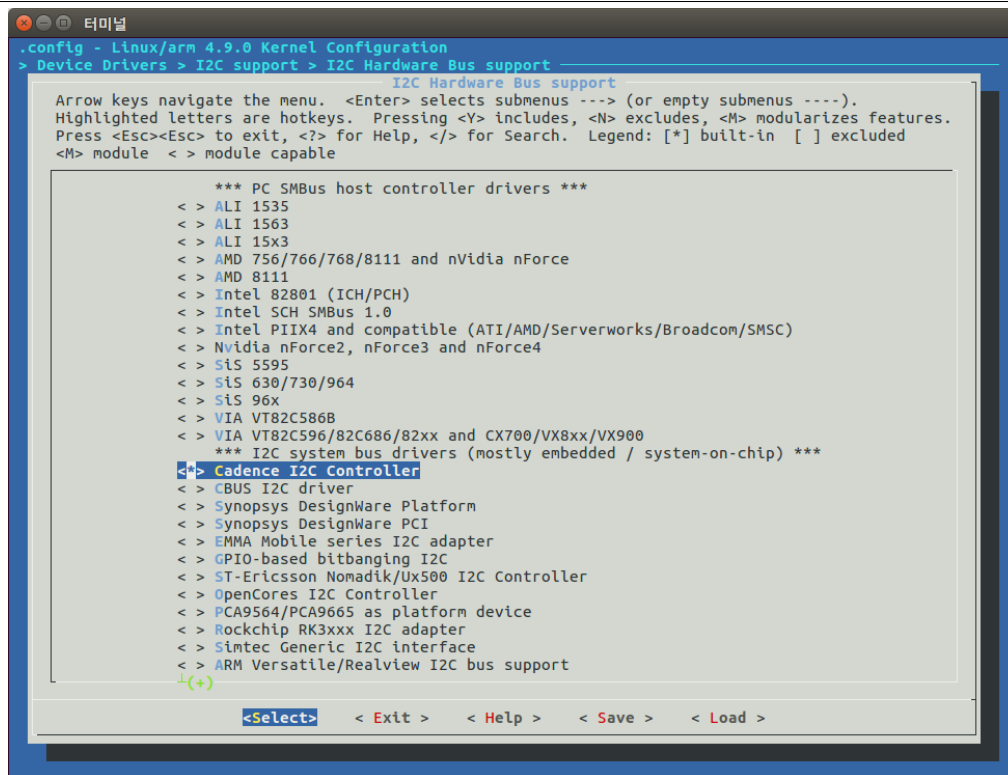
3. Device 설정 확인

```
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw$ petalinux-config -c kernel
[INFO] generating Kconfig for project

[INFO] sourcing bitbake
[INFO] generating plnxtool conf
[INFO] generating meta-plnx-generated layer
~/kiotta/fpga/2/mpu6050_sw/build/misc/plnx-generated ~/kiotta/fpga/2/mpu6050_sw
~/kiotta/fpga/2/mpu6050_sw
[INFO] generating machine configuration
[INFO] configuring: kernel
[INFO] generating kernel configuration files
[INFO] bitbake virtual/kernel -c menuconfig
Parsing recipes: 8% |#####
```







Candence i2c 인지 확인

4. Uboot 생성

```
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw$ petalinux-config -c u-boot
[INFO] generating Kconfig for project
[INFO] sourcing bitbake
[INFO] generating plnxtool conf
[INFO] generating meta-plnx-generated layer
~/kiotta/fpga/2/mpu6050_sw/build/misc/plnx-generated ~/kiotta/fpga/2/mpu6050_sw
~/kiotta/fpga/2/mpu6050_sw
[INFO] generating machine configuration
[INFO] configuring: u-boot
[INFO] generating u-boot configuration files
```

```
터미널
.config - U-Boot 2017.01 Configuration

U-Boot 2017.01 Configuration
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]

Architecture select (ARM architecture) --->
ARM architecture --->
General setup --->
Boot images --->
Boot timing --->
[*] Boot media --->
(4) delay in seconds before automatically booting
Console --->
() Default fdt file
[*] Disable support for parallel NOR flash
(+)
```

```
터미널
.config - U-Boot 2017.01 Configuration
> Boot media

Boot media
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]

[ ] Support for booting from NAND flash
[ ] Support for booting from ONENAND
[*] Support for booting from QSPI flash
[ ] Support for booting from SATA
[*] Support for booting from SD/EMMC
[ ] Support for booting from SPI flash
```

5. App 생성

```
kiott01a@kiott01a-Z20NH-A551B5U: ~/kiotta/fpga/2/mpu6050_sw
kiott01a@kiott01a-Z20NH-A551B5U:~/kiotta/fpga/2/mpu6050_sw$ petalinux-create -t apps -n mpu6050-app --enable
```

4. 코드 작성 후 build

```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2/mpu6050_sw$ petalinux-build
[INFO] building project
[INFO] sourcing bitbake
INFO: bitbake petalinux-user-image
Loading cache: 100% |#####
Loaded 3257 entries from dependency cache.
Parsing recipes: 100% |#####
Parsing of 2467 .bb files complete (2433 cached, 34 parsed). 3260 targets, 2
```

5. image 파일 생성

sd카드 파티션 생성 [how_to_boot_Zybo_with_sd_card.pdf](#) 참조

```
kiott01a@kiott01a-Z20NH-AS51B5U: ~/kiotta/fpga/2/mpu6050_sw/images/linux$ ls
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw$ ls
build components config.project images project-spec
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw$ cd images/
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw/images$ ls
linux
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw/images$ cd linux/
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw/images/linux$ ls
System.map.linux image.ub rootfs.cpio.gz rootfs.ext3 rootfs.ext4.gz rootfs.manifest system.dtb u-boot.elf zImage
i2c_mpu6050_wrapper.bit rootfs.cpio rootfs.cpio.gz u-boot rootfs.ext4 rootfs.jffs2 rootfs.tar.gz u-boot.bin vmlinux zynq_fsbl.elf
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw/images/linux$ petalinux-package --boot --force --fsbl zynq_fsbl.elf --fpga i2c_mpu6050_system_wrapper
r.bit --u-boot
INFO: File in BOOT BIN: "/home/kiott01a/kiotta/fpga/2/mpu6050_sw/images/linux/zynq_fsbl.elf"
ERROR: Failed to generate BIF file, File "/home/kiott01a/kiotta/fpga/2/mpu6050_sw/images/linux/i2c_mpu6050_system_wrapper.bit" doesn't exist.
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw/images/linux$ petalinux-package --boot --force --fsbl zynq_fsbl.elf --fpga i2c_mpu6050_wrapper.bit -
-u-boot
INFO: File in BOOT BIN: "/home/kiott01a/kiotta/fpga/2/mpu6050_sw/images/linux/zynq_fsbl.elf"
INFO: File in BOOT BIN: "/home/kiott01a/kiotta/fpga/2/mpu6050_sw/images/linux/i2c_mpu6050_wrapper.bit"
INFO: File in BOOT BIN: "/home/kiott01a/kiotta/fpga/2/mpu6050_sw/images/linux/u-boot.elf"
INFO: Generating zynq binary package BOOT.BIN...
INFO: Binary is ready.
WARNING: Unable to access the TFTPBOOT folder /tftpboot!!!
WARNING: Skip file copy to TFTPBOOT folder!!!
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw/images/linux$
```

이거 한 다음

cd를 사용해서 '생성명/images/linux'로 경로 변경

SD카드 rootfs 에 현재 경로의 rootfs.cpio를 복사

SD카드 BOOT에 현재 경로의 BOOT.bin, image.ub, system.dtb를 복사

복사후 SD카드 rootfs로 경로 변경(sudo cd /media/개정명/rootfs)

아래 명령어로 압축 해제

```
kiott01a@kiott01a-Z20NH-AS51B5U:~/kiotta/fpga/2/mpu6050_sw/images/linux$ sudo pax -rvf rootfs.cpio
.
proc
tmp
lib
lib/libBrokenLocale-2.23.so
lib/libresolv-2.23.so
lib/libz-1.2.11.so
```