Embedded System Architecture 2
LAB 2

FALL 2019

INSTRUCTOR: Mohsen Salahi

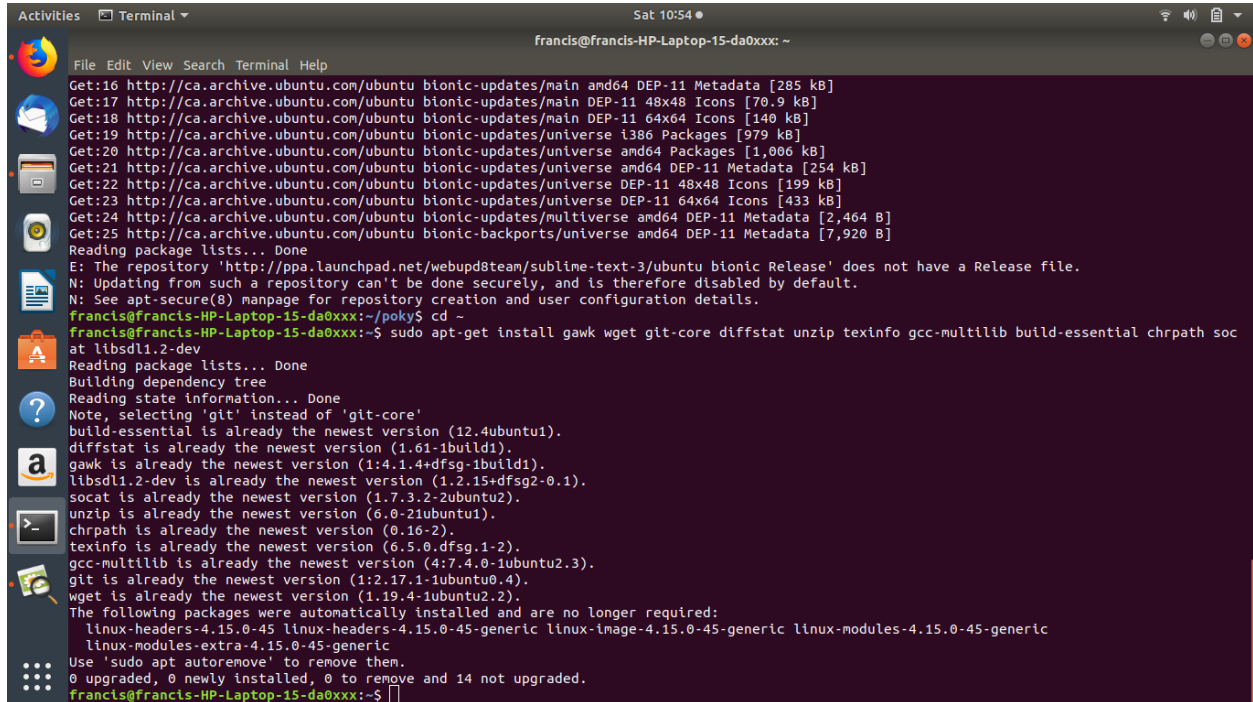**CLASS: ESE 3005**

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- **Environment setup of Yocto in DART-MX6**
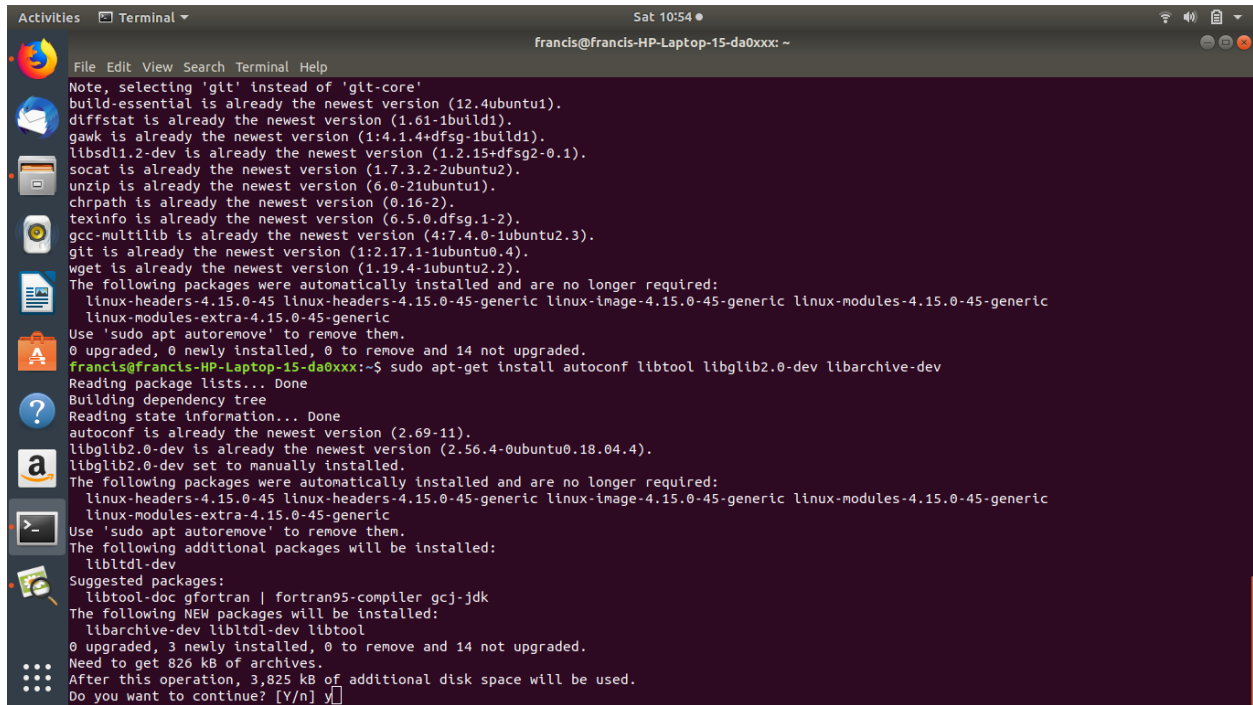
  1) Downloading required packages

2) Cooking the image and running it using qemu emulator

francis@francis-HP-Laptop-15-da0xxx: ~

File   Edit   View   Search   Terminal   Help

```
Preparing to unpack .../python-smmap_2.0.3-1_all.deb ...
Unpacking python-smmap (2.0.3-1) ...
Selecting previously unselected package python-gitdb.
Preparing to unpack .../python-gitdb_2.0.3-1_all.deb ...
Unpacking python-gitdb (2.0.3-1) ...
Selecting previously unselected package python-git.
Preparing to unpack .../python-git_2.1.8-1_all.deb ...
Unpacking python-git (2.1.8-1) ...
Setting up python-smmap (2.0.3-1) ...
Setting up python-gitdb (2.0.3-1) ...
Setting up python-git (2.1.8-1) ...
francis@francis-HP-Laptop-15-da0xxx:~$ sudo apt-get install docbook-utils python-pysqlite2 help2manmake gcc g++ desktop-file-utils libgl1-mesa
-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
E: Unable to locate package help2manmake
francis@francis-HP-Laptop-15-da0xxx:~$ sudo apt-get install docbook-utils python-pysqlite2 help2man make gcc g++ desktop-file-utils libgl1-mes
a-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
make is already the newest version (4.1-9.1ubuntu1).
docbook-utils is already the newest version (0.6.14-3.3).
help2man is already the newest version (1.47.6).
python-pysqlite2 is already the newest version (2.7.0-1).
desktop-file-utils is already the newest version (0.23-1ubuntu3.18.04.2).
g++ is already the newest version (4:7.4.0-1ubuntu2.3).
g++ set to manually installed.
gcc is already the newest version (4:7.4.0-1ubuntu2.3).
libgl1-mesa-dev is already the newest version (19.0.8-0ubuntu0~18.04.1).
libgl1-mesa-dev set to manually installed.
The following packages were automatically installed and are no longer required:
  linux-headers-4.15.0-45 linux-headers-4.15.0-45-generic linux-image-4.15.0-45-generic linux-modules-4.15.0-45-generic
  linux-modules-extra-4.15.0-45-generic
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 14 not upgraded.
francis@francis-HP-Laptop-15-da0xxx:~$
```

```
                          francis@francis-HP-Laptop-15-da0xxx: ~
File  Edit  View  Search  Terminal  Help
francis@francis-HP-Laptop-15-da0xxx:~$ sudo apt-get install python-git xterm sed cvs subversion coreutils texi2html
Reading package lists... Done
Building dependency tree
Reading state information... Done
coreutils is already the newest version (8.28-1ubuntu1).
sed is already the newest version (4.4-2).
cvs is already the newest version (2:1.12.13+real-26).
subversion is already the newest version (1.9.7-4ubuntu1).
texi2html is already the newest version (1.82+dfsg1-5).
xterm is already the newest version (330-1ubuntu2).
The following packages were automatically installed and are no longer required:
  linux-headers-4.15.0-45 linux-headers-4.15.0-45-generic linux-image-4.15.0-45-generic linux-modules-4.15.0-45-generic
  linux-modules-extra-4.15.0-45-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  python-gitdb python-smmap
Suggested packages:
  python-git-doc python-nose
The following NEW packages will be installed:
  python-git python-gitdb python-smmap
0 upgraded, 3 newly installed, 0 to remove and 14 not upgraded.
Need to get 368 kB of archives.
After this operation, 2,009 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ca.archive.ubuntu.com/ubuntu bionic/universe amd64 python-smmap all 2.0.3-1 [20.0 kB]
Get:2 http://ca.archive.ubuntu.com/ubuntu bionic/universe amd64 python-gitdb all 2.0.3-1 [46.6 kB]
Get:3 http://ca.archive.ubuntu.com/ubuntu bionic/universe amd64 python-git all 2.1.8-1 [301 kB]
Fetched 368 kB in 2s (230 kB/s)
Selecting previously unselected package python-smmap.
(Reading database ... 260789 files and directories currently installed.)
Preparing to unpack .../python-smmap_2.0.3-1_all.deb ...
Unpacking python-smmap (2.0.3-1) ...
Selecting previously unselected package python-gitdb.
Preparing to unpack .../python-gitdb_2.0.3-1_all.deb ...
Unpacking python-gitdb (2.0.3-1) ...
Selecting previously unselected package python-git.
Preparing to unpack .../python-git_2.1.8-1_all.deb ...
Unpacking python-git (2.1.8-1) ...
```

```
                          francis@francis-HP-Laptop-15-da0xxx: ~
File  Edit  View  Search  Terminal  Help
help2man is already the newest version (1.47.6).
python-pysqlite2 is already the newest version (2.7.0-1).
desktop-file-utils is already the newest version (0.23-1ubuntu3.18.04.2).
g++ is already the newest version (4:7.4.0-1ubuntu2.3).
g++ set to manually installed.
gcc is already the newest version (4:7.4.0-1ubuntu2.3).
libgl1-mesa-dev is already the newest version (19.0.8-0ubuntu0~18.04.1).
libgl1-mesa-dev set to manually installed.
The following packages were automatically installed and are no longer required:
  linux-headers-4.15.0-45 linux-headers-4.15.0-45-generic linux-image-4.15.0-45-generic linux-modules-4.15.0-45-generic
  linux-modules-extra-4.15.0-45-generic
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 14 not upgraded.
francis@francis-HP-Laptop-15-da0xxx:~$ sudo apt-get install libglu1-mesa-dev mercurial automake groff curl lzop asciidoc u-boot-tools dos2unix
 mtd-utils
Reading package lists... Done
Building dependency tree
Reading state information... Done
automake is already the newest version (1:1.15.1-3ubuntu2).
libglu1-mesa-dev is already the newest version (9.0.0-2.1build1).
libglu1-mesa-dev set to manually installed.
asciidoc is already the newest version (8.6.10-2).
lzop is already the newest version (1.03-4).
curl is already the newest version (7.58.0-2ubuntu3.8).
u-boot-tools is already the newest version (2018.07~rc3+dfsg1-0ubuntu3~18.04.1).
mercurial is already the newest version (4.5.3-1ubuntu2.1).
The following packages were automatically installed and are no longer required:
  linux-headers-4.15.0-45 linux-headers-4.15.0-45-generic linux-image-4.15.0-45-generic linux-modules-4.15.0-45-generic
  linux-modules-extra-4.15.0-45-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  psutils
The following NEW packages will be installed:
  dos2unix groff mtd-utils psutils
0 upgraded, 4 newly installed, 0 to remove and 14 not upgraded.
Need to get 3,767 kB of archives.
After this operation, 12.2 MB of additional disk space will be used.
Do you want to continue? [Y/n] ▯
```

2) Downloading the Yocto Fido

```
Activities    Terminal                              Sat 7:16 AM

                              francis@francis-HP-Laptop-15-da0xxx: ~

File  Edit  View  Search  Terminal  Help
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
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francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$ git config --global user.name "Francis Vijith"
francis@francis-HP-Laptop-15-da0xxx:~$ git config --global user.email "vijithjacob95@gmail.com"
francis@francis-HP-Laptop-15-da0xxx:~$
francis@francis-HP-Laptop-15-da0xxx:~$ curl http://commondatastorage.googleapis.com/git-repo-downloads/repo > ~/bin/repo
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 29142  100 29142    0     0  17747      0  0:00:01  0:00:01 --:--:-- 17737
francis@francis-HP-Laptop-15-da0xxx:~$ chmod a+x ~/bin/repo
francis@francis-HP-Laptop-15-da0xxx:~$  export PATH=~/bin:$PATH
francis@francis-HP-Laptop-15-da0xxx:~$ mkdir ~/var-som-mx6-yocto-fido
```



```
Activities    Terminal                              Sat 7:17 AM

                              francis@francis-HP-Laptop-15-da0xxx: ~

File  Edit  View  Search  Terminal  Help
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-dizzy/build_x11$ chmod a+x ~/bin/repo
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-dizzy/build_x11$ export PATH=~/bin:$PATH
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-dizzy/build_x11$ mkdir ~/var-som-mx6-yocto-fido
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-dizzy/build_x11$ cd ~/var-som-mx6-yocto-fido
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido$ repo init -u git://git.freescale.com/imx/fsl-arm-yocto-bsp.git -b imx-3.14.38-6Q
P_ga
Get https://gerrit.googlesource.com/git-repo/clone.bundle
Get https://gerrit.googlesource.com/git-repo
remote: Finding sources: 100% (49/49)
remote: Total 49 (delta 7), reused 49 (delta 7)
Unpacking objects: 100% (49/49), done.
From https://gerrit.googlesource.com/git-repo
   fb527e3..c8290ad  master     -> origin/master
Get git://git.freescale.com/imx/fsl-arm-yocto-bsp.git
remote: Counting objects: 809, done.
remote: Compressing objects: 100% (730/730), done.
remote: Total 809 (delta 347), reused 235 (delta 76)
Receiving objects: 100% (809/809), 136.79 KiB | 121.00 KiB/s, done.
Resolving deltas: 100% (347/347), done.
```



```
Activities    Terminal                              Sat 7:18 AM

                              francis@francis-HP-Laptop-15-da0xxx: ~

File  Edit  View  Search  Terminal  Help
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido$ repo sync
Fetching project meta-browser
Fetching project meta-fsl-arm
remote: Enumerating objects: 29, done.
remote: Counting objects: 100% (29/29), done.
remote: Compressing objects: 100% (13/13), done.
remote: Counting objects: 13363, done.
remote: Compressing objects: 100% (4737/4737), done.          /s
remote: Total 6016 (delta 11), reused 25 (delta 11), pack-reused 5987
Receiving objects: 100% (6016/6016), 2.08 MiB | 819.00 KiB/s, done.
Resolving deltas: 100% (3957/3957), done.
From git://github.com/OSSystems/meta-browser KiB | 176.00 KiB/s
 * [new branch]      danny        -> OSSystems/danny
 * [new branch]      dora         -> OSSystems/dora
 * [new branch]      dylan        -> OSSystems/dylan
 * [new branch]      jansa/master -> OSSystems/jansa/master
 * [new branch]      jethro       -> OSSystems/jethro
 * [new branch]      krogoth      -> OSSystems/krogoth
 * [new branch]      master       -> OSSystems/master
 * [new branch]      morty        -> OSSystems/morty
Fetching projects:  11% (1/9)
Fetching project fsl-community-bsp-base04.00 KiB | 176.00 KiB/s
remote: Enumerating objects: 271, done.          B | 229.00 KiB/s
remote: Total 271 (delta 0), reused 0 (delta 0), pack-reused 271
Receiving objects: 100% (271/271), 57.36 KiB | 364.00 KiB/s, done.
Resolving deltas: 100% (147/147), done.
From git://github.com/Freescale/fsl-community-bsp-base.00 KiB/s
 * [new tag]         1.2          -> 1.2
 * [new tag]         1.2-rc1      -> 1.2-rc1
 * [new tag]         1.3          -> 1.3
 * [new tag]         1.4          -> 1.4
 * [new tag]         1.5          -> 1.5
 * [new tag]         1.6          -> 1.6
 * [new tag]         1.7          -> 1.7
 * [new tag]         1.8          -> 1.8
 * [new tag]         2.0          -> 2.0
 * [new tag]         2.1          -> 2.1
 * [new tag]         2.2          -> 2.2
```

3) Downloading Yocto Fido i.MX6 with Meta Variscite VAR-SOM-MX6 support


```
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido$ cd ~/var-som-mx6-yocto-fido/sources
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/sources$ git clone https://github.com/varigit/meta-variscite-imx.git -b imx_3.14.
38_6qp-var02 meta-variscite-mx6
Cloning into 'meta-variscite-mx6'...
remote: Enumerating objects: 387, done.
remote: Counting objects: 100% (387/387), done.
remote: Compressing objects: 100% (256/256), done.
remote: Total 3687 (delta 174), reused 306 (delta 110), pack-reused 3300
Receiving objects: 100% (3687/3687), 1.32 MiB | 2.42 MiB/s, done.
Resolving deltas: 100% (1887/1887), done.
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/sources$ cp meta-variscite-mx6/scripts/var-setup-release.sh ../
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/sources$ cd meta-fsl-bsp-release
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/sources/meta-fsl-bsp-release$ patch -p1 < ../meta-variscite-mx6/patch/0001-Fix-FS
L-multi-patch-append-bug.patch
patching file imx/meta-bsp/recipes-multimedia/gstreamer/gstreamer1.0-plugins-bad_%.bbappend
Hunk #1 succeeded at 59 with fuzz 1 (offset 9 lines).
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/sources/meta-fsl-bsp-release$ patch -p1 < ../meta-variscite-mx6/patch/0001-Fix-F
SL-multi-platform-on-mesa-demos.patch
patching file imx/meta-bsp/recipes-graphics/mesa/mesa-demos_%.bbappend
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/sources/meta-fsl-bsp-release$ patch -p1 < ../meta-variscite-mx6/patch/0001-FS
L-multi-patch-append-bug.patch
patching file imx/meta-bsp/recipes-multimedia/gstreamer/gstreamer1.0-plugins-bad_%.bbappend
Reversed (or previously applied) patch detected!  Assume -R? [n]
Apply anyway? [n]
```

4) Building and setting up Yocto


```
Apply anyway? [n]
Skipping patch.
1 out of 1 hunk ignored -- saving rejects to file imx/meta-bsp/recipes-graphics/mesa/mesa-demos_%.bbappend.rej
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/sources/meta-fsl-bsp-release$ cd ~/var-som-mx6-yocto-fido
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido$ source var-setup-release.sh -b build_fb -e fb

 Build directory is  build_fb

 Using FB backend with FB DIST_FEATURES to override poky X11 DIST FEATURES
setting to default machine
Configuring for var-som-mx6

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LA_OPT_FSL_OPEN_3RD_PARTY_IP v8 June 2015

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Agreement, do not download or install the Licensed Software. If you change your
```

File   Edit   View   Search   Terminal   Help

```
francis@francis-HP-Laptop-15-da0xxx:~/var-som-mx6-yocto-fido/build_fb$ bitbake fsl-image-qt5
WARNING: Host distribution "Ubuntu-18.04" has not been validated with this version of the build system; you may possibly experience unexpected
 failures. It is recommended that you use a tested distribution.
Parsing recipes: 100% |#############################################################################################################| Time: 00:00:54
Parsing of 2068 .bb files complete (0 cached, 2068 parsed). 2584 targets, 363 skipped, 3 masked, 0 errors.
NOTE: Resolving any missing task queue dependencies
NOTE: multiple providers are available for jpeg (jpeg, libjpeg-turbo)
NOTE: consider defining a PREFERRED_PROVIDER entry to match jpeg
NOTE: multiple providers are available for runtime libgl-mesa-dev (mesa, mesa-gl)
NOTE: consider defining a PREFERRED_PROVIDER entry to match libgl-mesa-dev
NOTE: multiple providers are available for runtime libglapi (mesa, mesa-gl)
NOTE: consider defining a PREFERRED_PROVIDER entry to match libglapi

Build Configuration:
BB_VERSION        = "1.26.0"
BUILD_SYS         = "x86_64-linux"
NATIVELSBSTRING   = "Ubuntu-18.04"
TARGET_SYS        = "arm-poky-linux-gnueabi"
MACHINE           = "var-som-mx6"
DISTRO            = "poky"
DISTRO_VERSION    = "1.8"
TUNE_FEATURES     = "arm armv7a vfp thumb neon callconvention-hard cortexa9"
TARGET_FPU        = "vfp-neon"
meta
meta-yocto        = "(nobranch):ee88b51cf2853ab075c9bd2ef7cf4d65d1c96674"
meta-oe
meta-multimedia   = "(nobranch):10d3c8f85280a0bf867a8e4f84bcda81c290d28e"
meta-fsl-arm      = "(nobranch):92f95101da529f4b67ef8d1af50ce762f81f40ad"
meta-fsl-arm-extra = "(nobranch):0786aa76f4772ea7b83d4bab10567c4530b2d1bc"
meta-fsl-demos    = "(nobranch):836bdf5a9d500ed258f1ddc07d89eca74a704098"
meta-bsp
meta-sdk          = "(nobranch):1b5d466510723a4b3e4a841e6bf86915def65094"
meta-browser      = "(nobranch):30b8d6b3d0d6501c56ef6967a2fa73a3d4bf5fe9"
meta-gnome
meta-networking
meta-python
meta-ruby
meta-filesystems  = "(nobranch):10d3c8f85280a0bf867a8e4f84bcda81c290d28e"
```
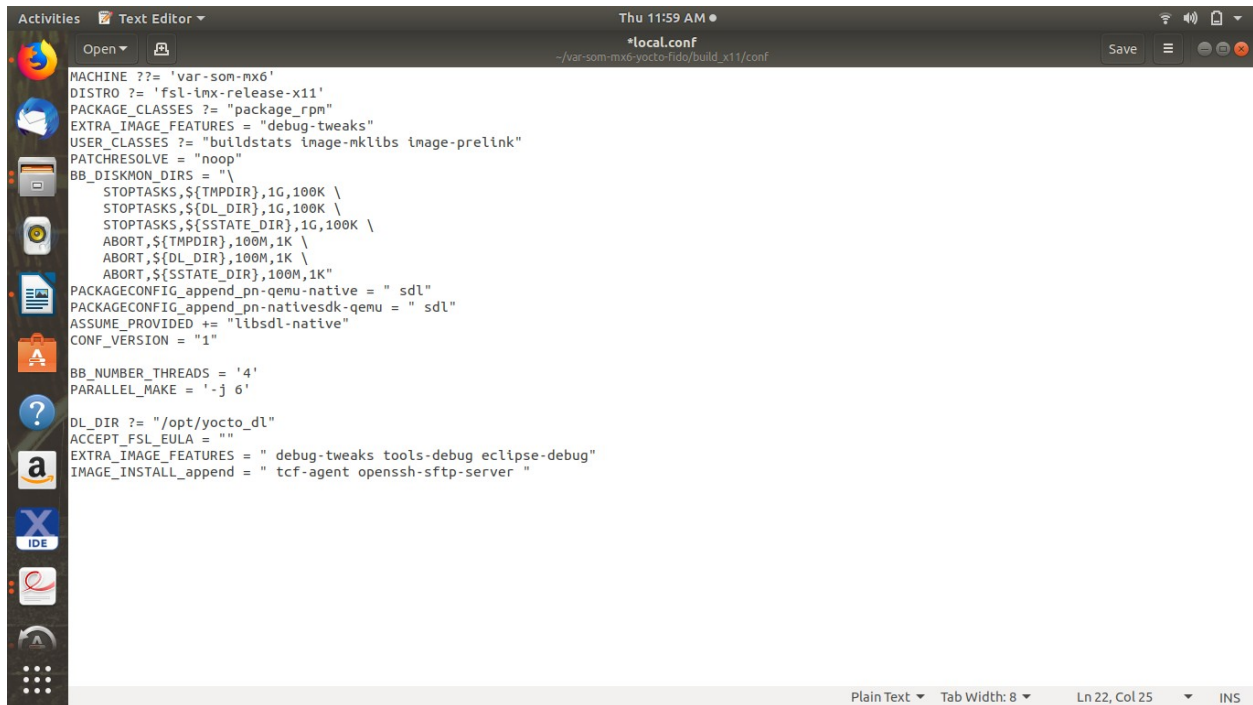
The bitbake process was showing an error (Task 782 (virtual:native:/home/francis/var-som-mx6-yocto-fido/sources/poky/meta/recipes-devtools/automake/automake_1.15.bb,

do_compile), where do_compile is shell function, failed with exit code '1' which made the entire process to fail to bring back a non-zero exit code. The same process was repeated and the result was the same.

5) Customization of local.conf file