



# Embedded System Architecture 2

## LAB 1

**FALL 2019**

**INSTRUCTOR:** Mohsen Salahi

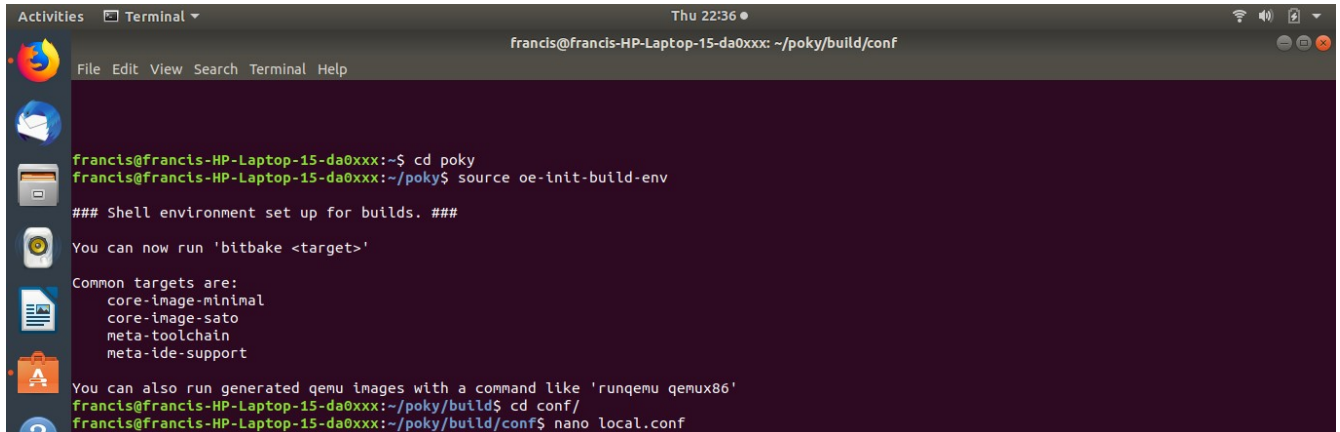
**CLASS:** ESE 3005

Student Name	Student ID	Signature*
FRANCIS VIJITH	C0742980	FV
NIBIN SOBY	C0741660	NS
AKHIL GEORGE	C0748466	AG
VIJAYAPRAKASH	C0744450	VI
PRATHYUSHA MUNI	C0743277	PM

*\*By signing above you attest that you have contributed to this submission and confirm that all work you have contributed to this submission is your own work. Any suspicion of copying or plagiarism in this work will result in an investigation of Academic Misconduct and may result in a "0" on the work, an "F" in the course, or possibly more severe penalties.*

- **Build an image of an ARM machine in Yocto.**

## **1) Setting up the environment and changing the default machine to ARM**



A terminal window titled 'francis@francis-HP-Laptop-15-da0xxx: ~/poky/build/conf' showing the following commands and output:

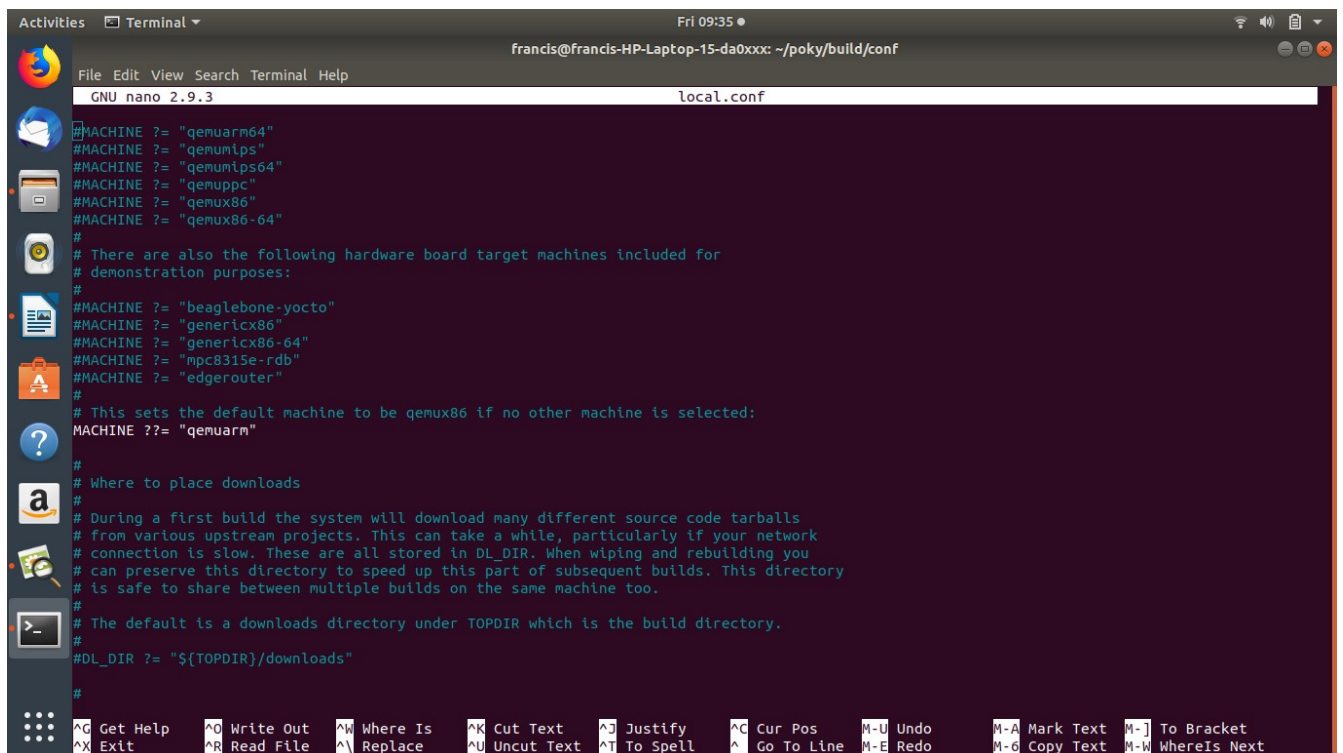
```
francis@francis-HP-Laptop-15-da0xxx:~$ cd poky
francis@francis-HP-Laptop-15-da0xxx:~/poky$ source oe-init-build-env

### Shell environment set up for builds. ###

You can now run 'bitbake <target>'

Common targets are:
  core-image-minimal
  core-image-sato
  meta-toolchain
  meta-ide-support

You can also run generated qemu images with a command like 'runqemu qemux86'
francis@francis-HP-Laptop-15-da0xxx:~/poky/build$ cd conf/
francis@francis-HP-Laptop-15-da0xxx:~/poky/build/conf$ nano local.conf
```



A terminal window titled 'francis@francis-HP-Laptop-15-da0xxx: ~/poky/build/conf' showing the contents of the `local.conf` file in the nano editor. The file content is as follows:

```
GNU nano 2.9.3 local.conf

#MACHINE ?= "qemuarm64"
#MACHINE ?= "qemumips"
#MACHINE ?= "qemumips64"
#MACHINE ?= "qemuappc"
#MACHINE ?= "qemux86"
#MACHINE ?= "qemux86-64"
#
# There are also the following hardware board target machines included for
# demonstration purposes:
#
#MACHINE ?= "beaglebone-yocto"
#MACHINE ?= "genericx86"
#MACHINE ?= "genericx86-64"
#MACHINE ?= "mpc8315e-rdb"
#MACHINE ?= "edgerouter"
#
# This sets the default machine to be qemux86 if no other machine is selected:
MACHINE ??= "qemuarm"
#
# Where to place downloads
#
# During a first build the system will download many different source code tarballs
# from various upstream projects. This can take a while, particularly if your network
# connection is slow. These are all stored in DL_DIR. When wiping and rebuilding you
# can preserve this directory to speed up this part of subsequent builds. This directory
# is safe to share between multiple builds on the same machine too.
#
# The default is a downloads directory under TOPDIR which is the build directory.
#
#DL_DIR ?= "${TOPDIR}/downloads"

^G Get Help  ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos   M-U Undo     M-A Mark Text M-J To Bracket
^X Exit      ^R Read File  ^M Replace    ^U Uncut Text ^T To Spell   ^_ Go To Line  M-E Redo     M-G Copy Text M-W WhereIs Next
```

## 2) Cooking the image and running it using qemu emulator

```
Activities Terminal Thu 22:36 francis@francis-HP-Laptop-15-da0xxx: ~/poky/build/conf

File Edit View Search Terminal Help

francis@francis-HP-Laptop-15-da0xxx:~/poky/build/conf$ bitbake core-image-sato
Loading cache: 100% |#####| Time: 0:00:00
Loaded 1303 entries from dependency cache.
NOTE: Resolving any missing task queue dependencies

Build Configuration:
BB_VERSION      = "1.42.0"
BUILD_SYS       = "x86_64-linux"
NATIVELSBSTRING = "universal"
TARGET_SYS      = "arm-poky-linux-gnueabi"
MACHINE         = "qemuarm"
DISTRO          = "poky"
DISTRO_VERSION  = "2.7.1"
TUNE_FEATURES   = "arm armv7ve vfp thumb neon callconvention-hard"
TARGET_FPU      = "hard"
meta
meta-poky
meta-yocto-bsp   = "my-yocto-2.7.1:38d5c8ea98cfa49825c473eba8984c12edf062be"

Initialising tasks: 100% |#####| Time: 0:00:03
Sstate summary: Wanted 1167 Found 0 Missed 1167 Current 995 (0% match, 46% complete)
NOTE: Executing SetScene Tasks
NOTE: Executing RunQueue Tasks
NOTE: Tasks Summary: Attempted 5981 tasks of which 3476 didn't need to be rerun and all succeeded.
francis@francis-HP-Laptop-15-da0xxx:~/poky/build/conf$ runqemu qemuarm
runqemu - INFO - Running MACHINE=qemuarm bitbake -e...
runqemu - INFO - Continuing with the following parameters:
KERNEL: [/home/francis/poky/build/tmp/ deploy/images/qemuarm/zImage--5.0.19+git0+31de88e51d_9161b2fa2f-r0-qemuarm-20190919184029.bin]
MACHINE: [qemuarm]
FSTYPE: [ext4]
ROOTFS: [/home/francis/poky/build/tmp/ deploy/images/qemuarm/core-image-sato-qemuarm-20190919233812.rootfs.ext4]
CONFFILE: [/home/francis/poky/build/tmp/ deploy/images/qemuarm/core-image-sato-qemuarm-20190919233812.qemuboot.conf]

runqemu - INFO - Setting up tap interface under sudo
[sudo] password for francis:
runqemu - INFO - Network configuration: 192.168.7.2::192.168.7.1:255.255.255.0
runqemu - INFO - Running /home/francis/poky/build/tmp/work/x86_64-linux/qemu-helper-native/1.0-r1/recipe-sysroot-native/usr/bin/qemu-system-ar
```