PRACTICAL EXAM
RTES

YOCTO

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MODENA

LEVEL 0

Baseline

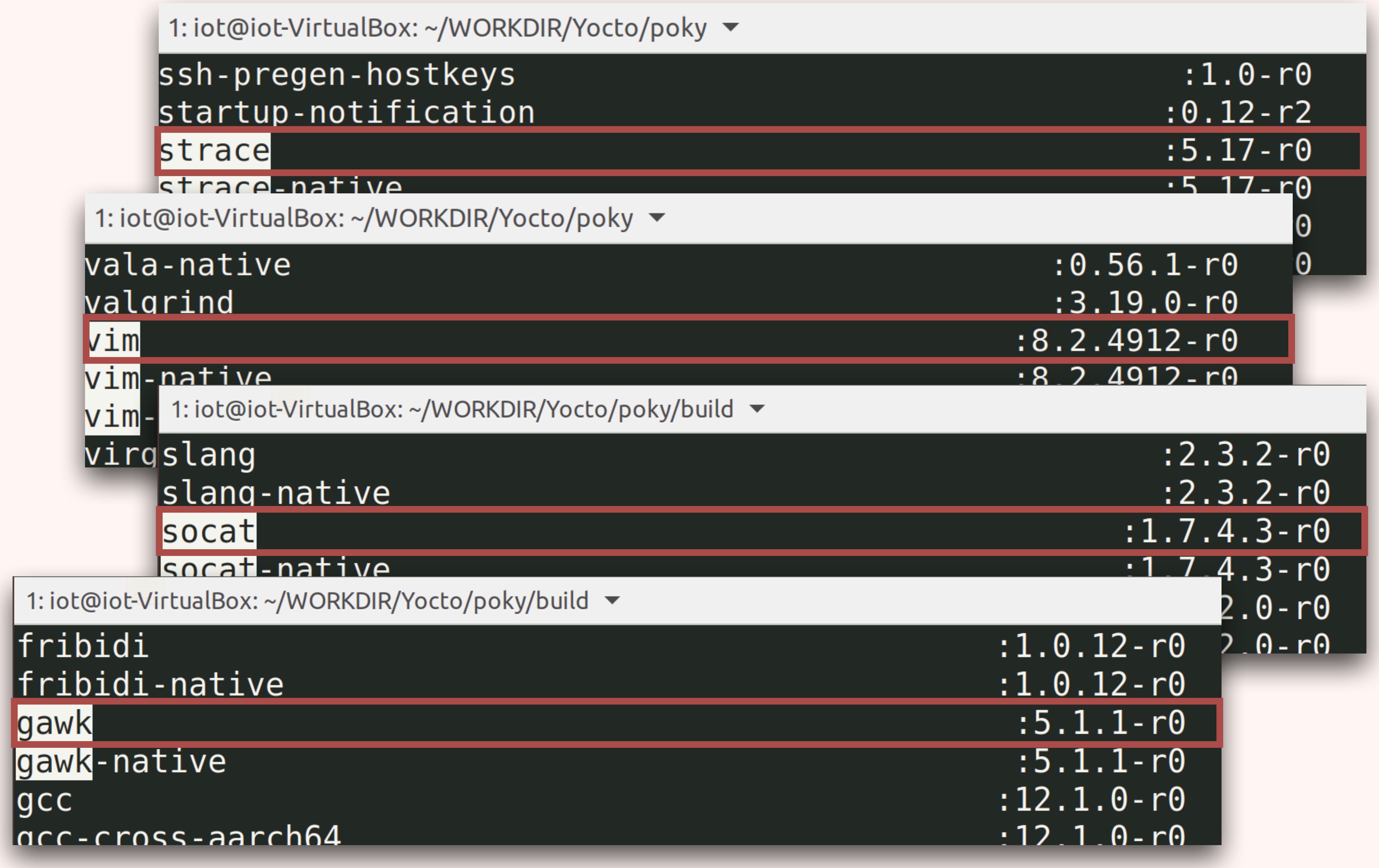
PACKAGES INSTALLATION

First

Check which of the following packages can be installed without downloading them from the internet.

```
bitbake -s | less
```

- *strace*
- *socat*
- *vim*
- *gawk*



1: iot@iot-VirtualBox: ~/WORKDIR/Yocto/poky

```
ssh-pregen-hostkeys                                         :1.0-r0
startup-notification                                        :0.12-r2
strace                                                      :5.17-r0
strace-native                                               :5.17-r0
```

1: iot@iot-VirtualBox: ~/WORKDIR/Yocto/poky

```
vala-native                                               :0.56.1-r0
valgrind                                                  :3.19.0-r0
vim                                                      :8.2.4912-r0
vim-native                                               :8.2.4912-r0
vim-
virg
```

1: iot@iot-VirtualBox: ~/WORKDIR/Yocto/poky/build

```
slang                                                      :2.3.2-r0
slang-native                                               :2.3.2-r0
socat                                                    :1.7.4.3-r0
socat-native                                             :1.7.4.3-r0
                                                             2.0-r0
                                                             2.0-r0
```

1: iot@iot-VirtualBox: ~/WORKDIR/Yocto/poky/build

```
fribidi                                                   :1.0.12-r0
fribidi-native                                            :1.0.12-r0
gawk                                                       :5.1.1-r0
gawk-native                                                :5.1.1-r0
gcc                                                       :12.1.0-r0
gcc-cross-aarch64                                         :12.1.0-r0
```

PACKAGES INSTALLATION

Add Packages

Add all the packages in the *local.conf* file using the *IMAGE_INSTALL* keyword and the *:append* particle.

Doing so they will be installed.

build/conf/local.conf

```
...
IMAGE_INSTALL:append = " strace”
IMAGE_INSTALL:append = " socat"
IMAGE_INSTALL:append = " vim"
IMAGE_INSTALL:append = " gawk”
...
```

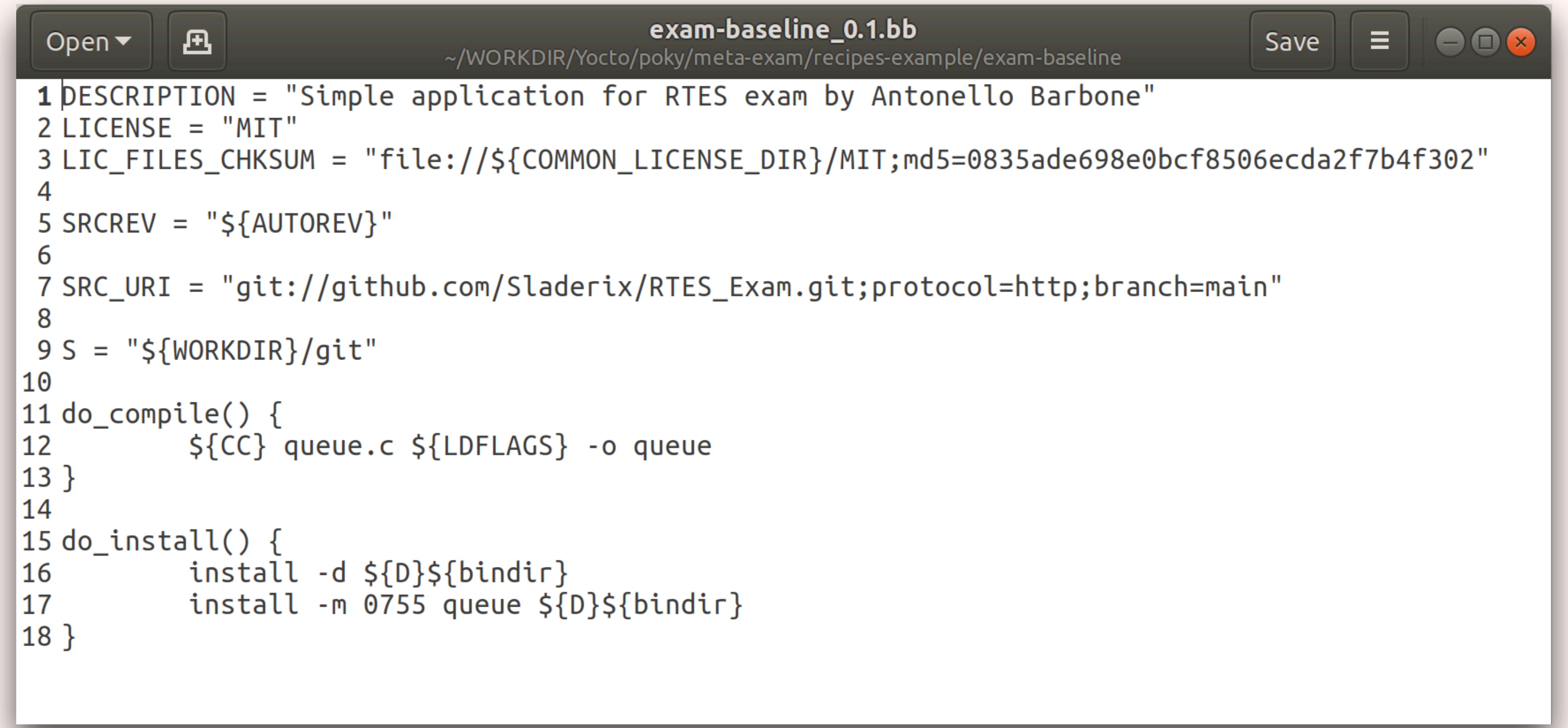
CUSTOM APPLICATION

Coding

The custom application is coded in C and then uploaded to a GitHub repository.

Yocto Recipe

The recipe is configured to download the repository and take the C file from there.


Open
exam-baseline_0.1.bb
~/WORKDIR/Yocto/poky/meta-exam/recipes-example/exam-baseline
Save

```
DESCRIPTION = "Simple application for RTES exam by Antonello Barbone"
LICENSE = "MIT"
LIC_FILES_CHKSUM = "file://${COMMON_LICENSE_DIR}/MIT;md5=0835ade698e0bcf8506ecda2f7b4f302"

SRCREV = "${AUTOREV}"

SRC_URI = "git://github.com/Sladerix/RTES_Exam.git;protocol=http;branch=main"

S = "${WORKDIR}/git"

do_compile() {
        ${CC} queue.c ${LDFLAGS} -o queue
}

do_install() {
        install -d ${D}${bindir}
        install -m 0755 queue ${D}${bindir}
}
```

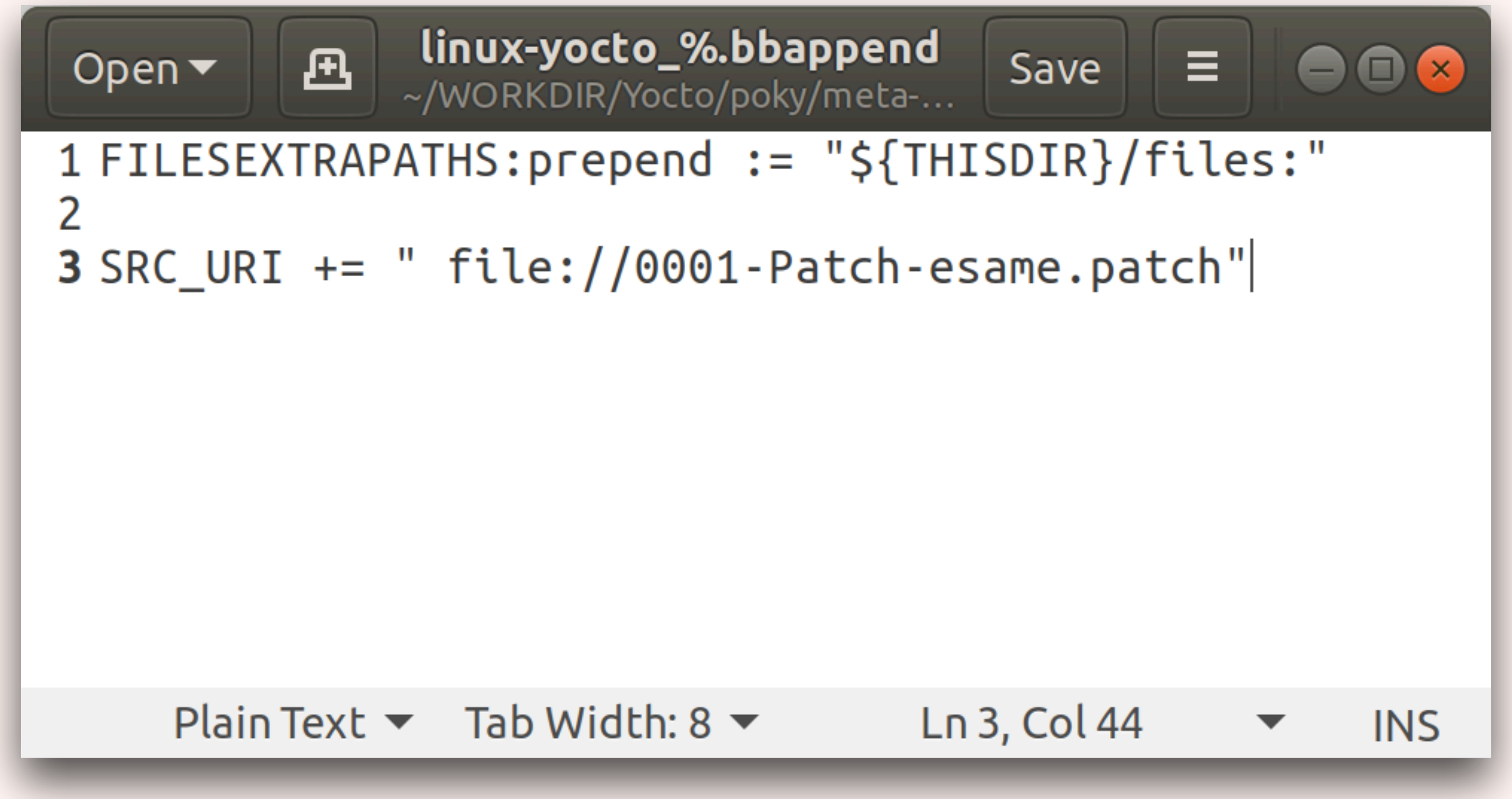
LEVEL 1

Advanced

PATCHING

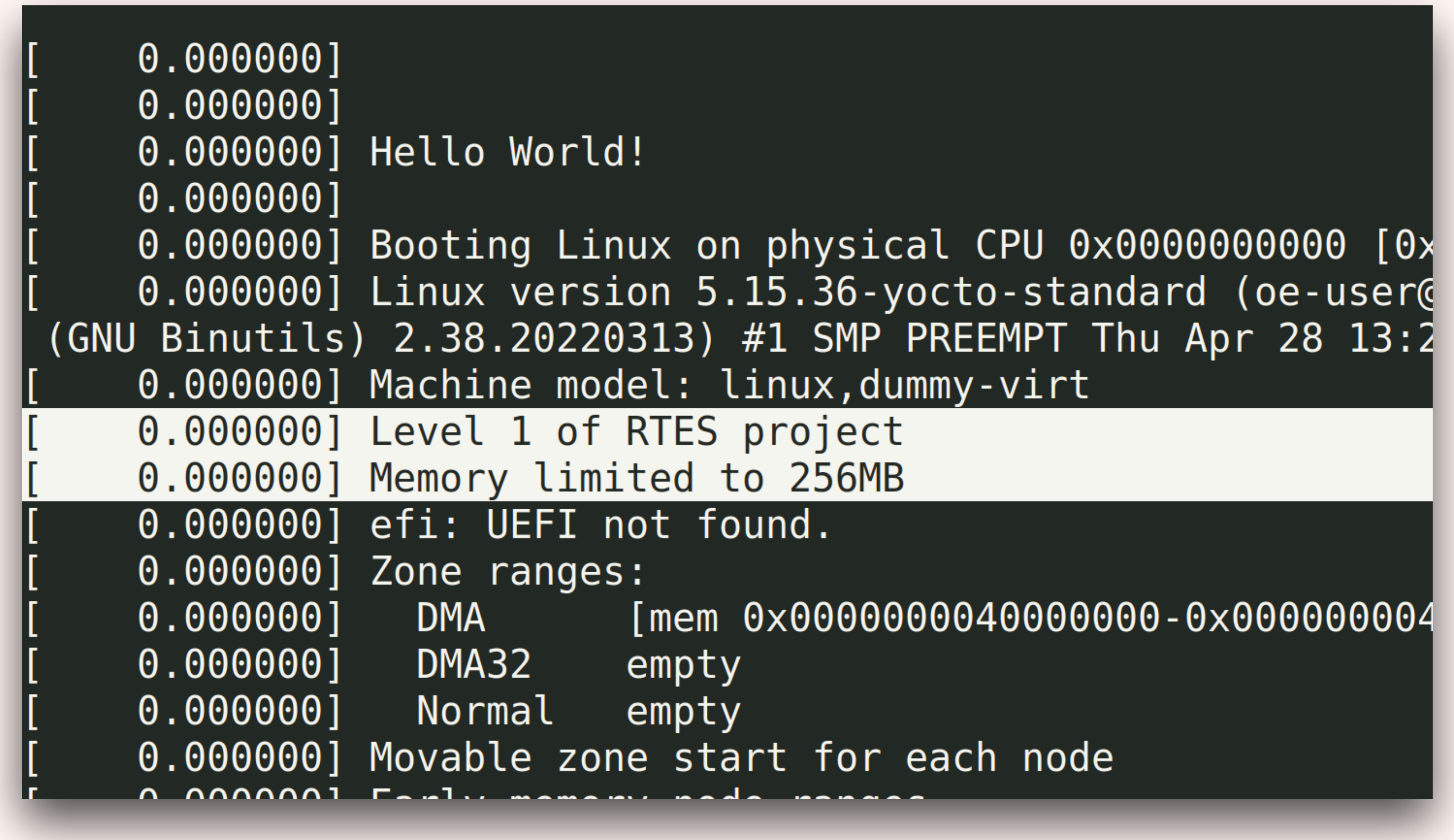
Add the Patch

In the *meta/meta-exam/* layer folder, created for the exam, was create also the *recipe-kernel/linux/* folder needed to contain the patches for the kernel. In this last folder is contained the *.bbappend* file that specifies where to get the patch file (E.g. contained in the *files/* folder).



```
FILESEXTRAPATHS:prepend := "${THISDIR}/files:"

SRC_URI += " file://0001-Patch-esame.patch"
```



```
[    0.000000]
[    0.000000]
[    0.000000] Hello World!
[    0.000000]
[    0.000000] Booting Linux on physical CPU 0x0000000000 [0x
[    0.000000] Linux version 5.15.36-yocto-standard (oe-user@
 (GNU Binutils) 2.38.20220313) #1 SMP PREEMPT Thu Apr 28 13:2
[    0.000000] Machine model: linux,dummy-virt
[    0.000000] Level 1 of RTES project
[    0.000000] Memory limited to 256MB
[    0.000000] efi: UEFI not found.
[    0.000000] Zone ranges:
[    0.000000]   DMA      [mem 0x0000000040000000-0x000000004
[    0.000000]   DMA32    empty
[    0.000000]   Normal   empty
[    0.000000] Movable zone start for each node
[    0.000000] Early memory node ranges
```

LEVEL 2

Expert

THREAD APPLICATION

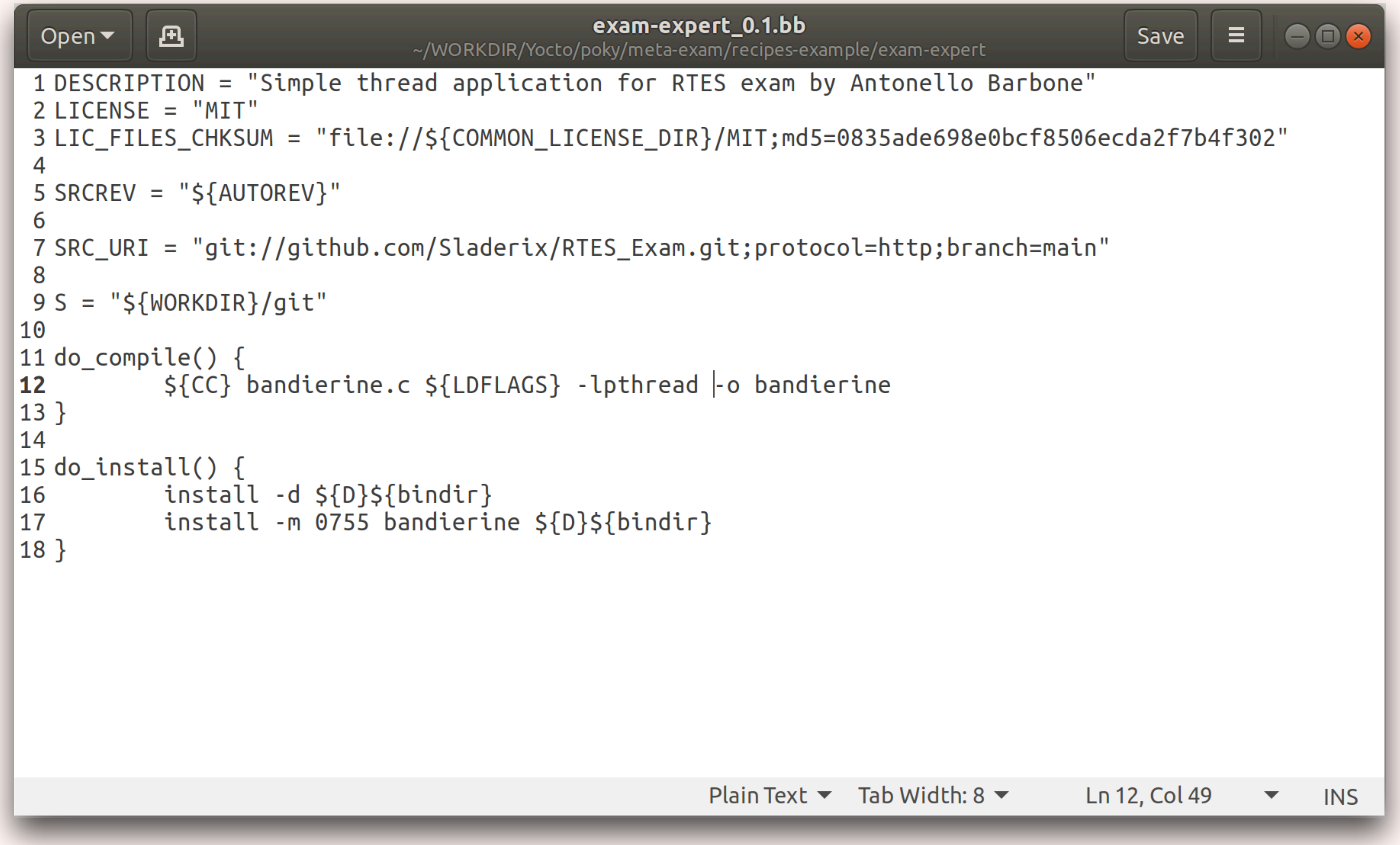
Coding

The thread application is coded in *C* and then uploaded to a GitHub repository.

Yocto Recipe

The recipe is configured to download the repository and take the *C* file from there.

The flag *-lpthread* is specified to the cross-compiler.



```
DESCRIPTION = "Simple thread application for RTES exam by Antonello Barbone"
LICENSE = "MIT"
LIC_FILES_CHKSUM = "file://${COMMON_LICENSE_DIR}/MIT;md5=0835ade698e0bcf8506ecda2f7b4f302"

SRCREV = "${AUTOREV}"

SRC_URI = "git://github.com/Sladerix/RTES_Exam.git;protocol=http;branch=main"

S = "${WORKDIR}/git"

do_compile() {
        ${CC} bandierine.c ${LDFLAGS} -lpthread -o bandierine
}

do_install() {
        install -d ${D}${bindir}
        install -m 0755 bandierine ${D}${bindir}
}
```