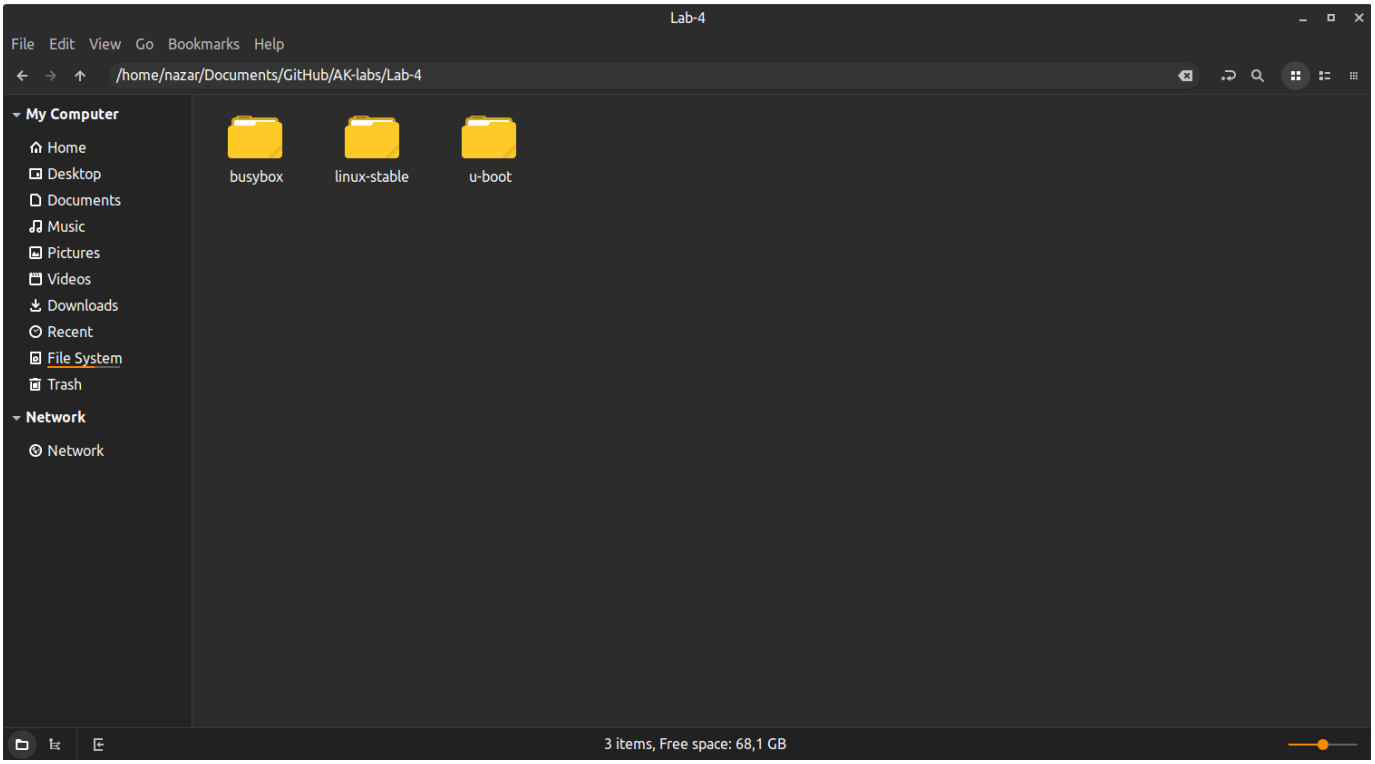
Національний технічний університет України
«Київський політехнічний інститут імені Ігоря Сікорського»
Факультет інформатики та обчислювальної техніки
Кафедра обчислювальної техніки

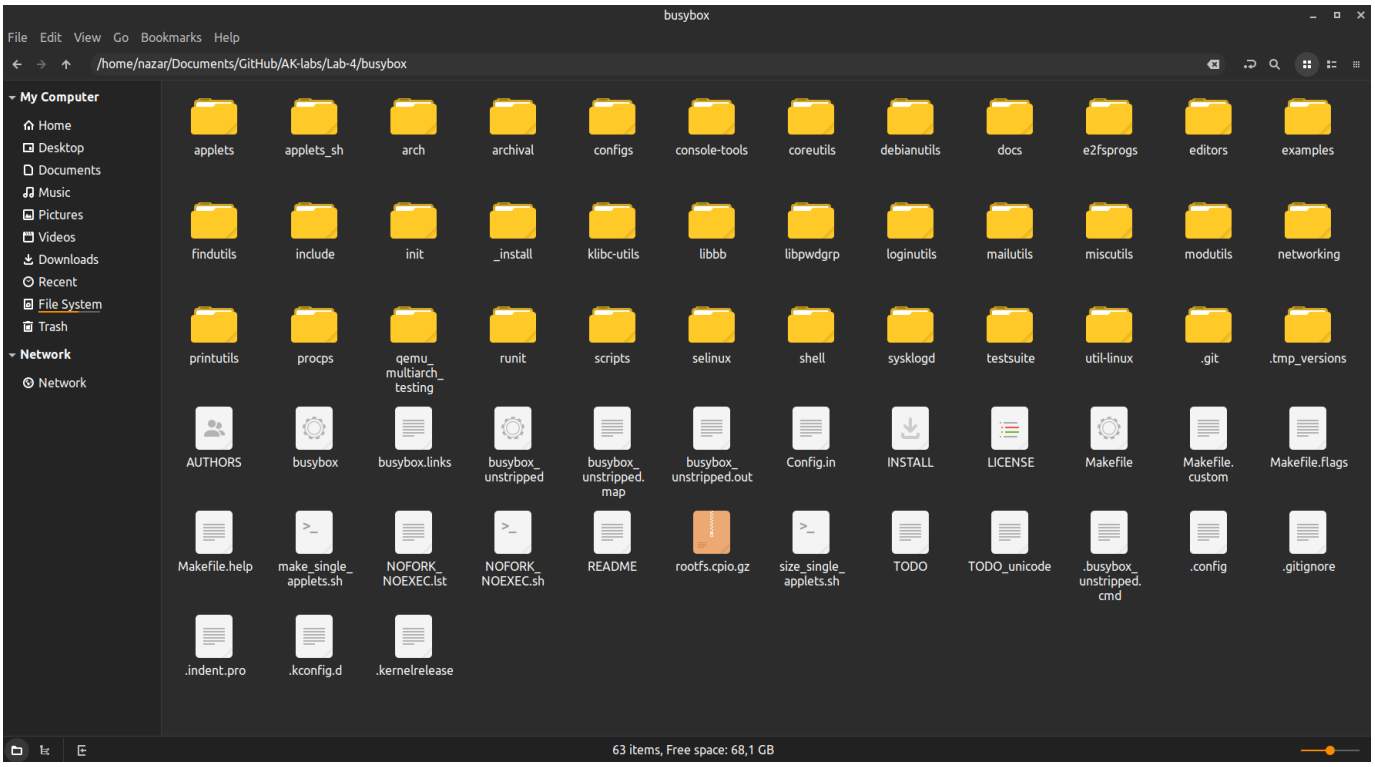
Архітектура комп'ютерів-2. Процесори

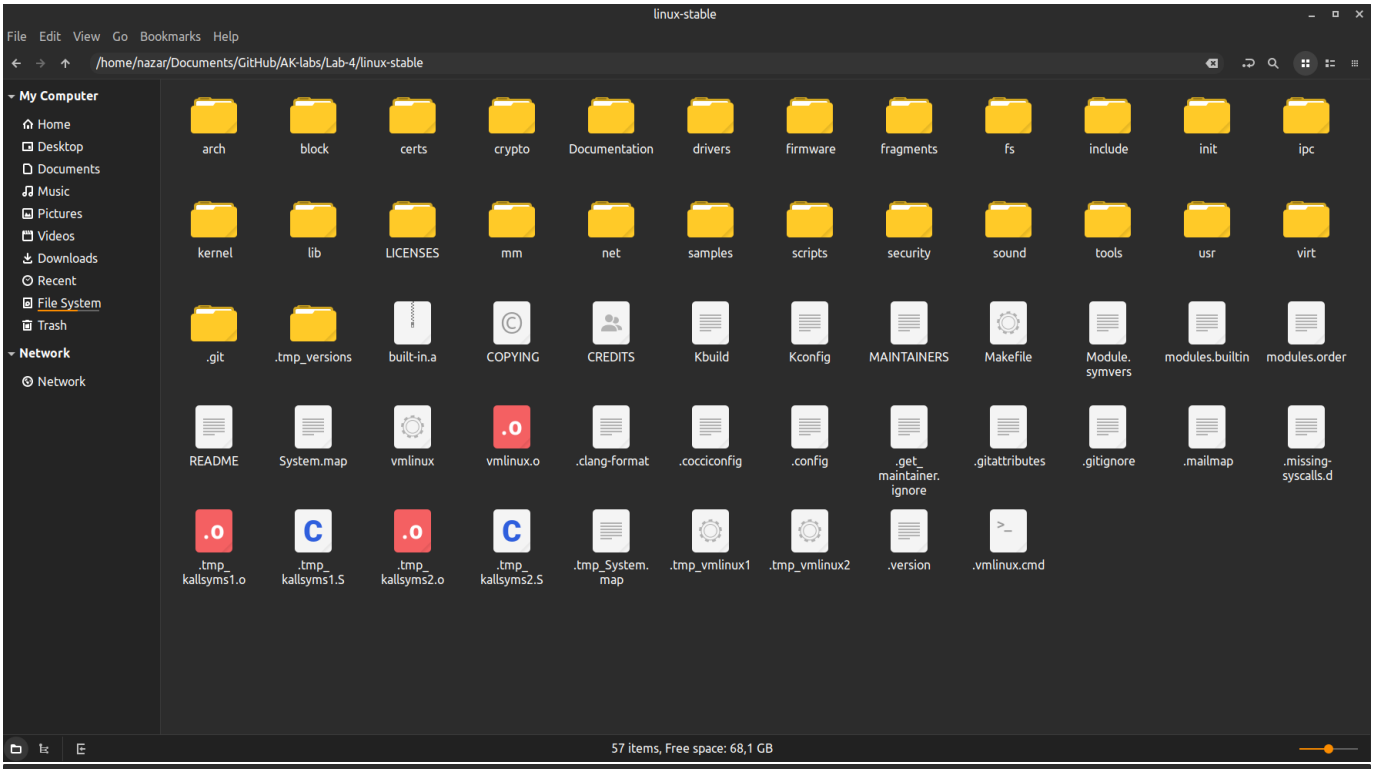
Лабораторна робота №4

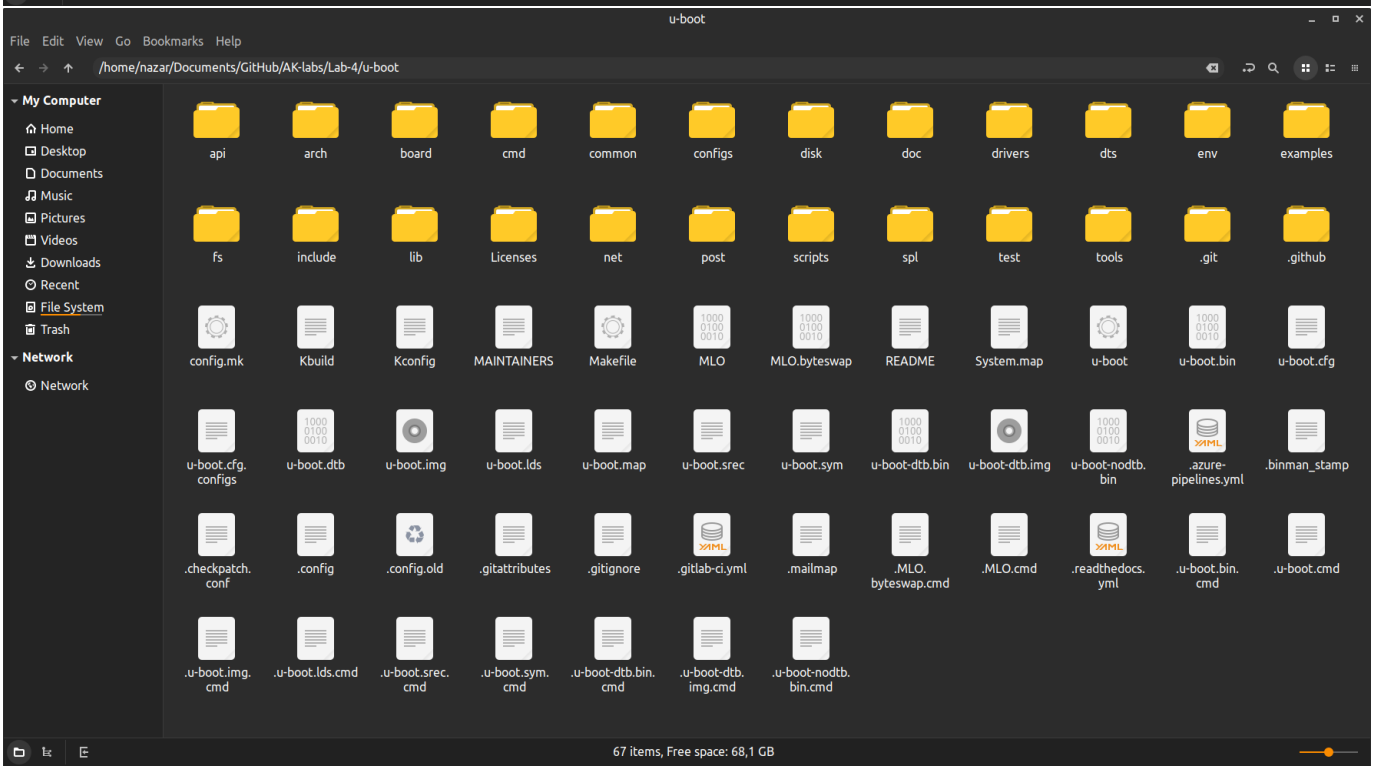
Виконав:
студент групи ІВ-91
Чопик Назар
Перевірив:
пос. Нікольський С. С.

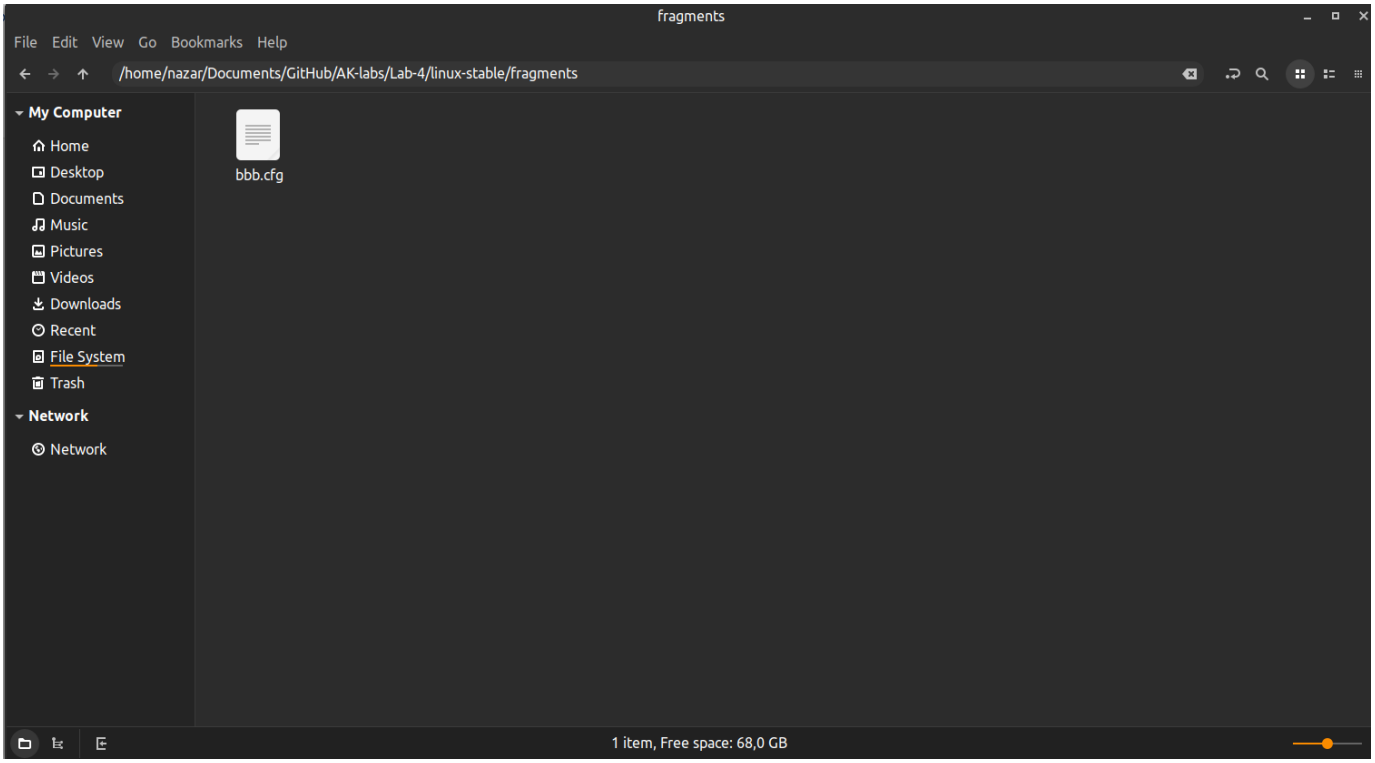
Київ 2021 р.

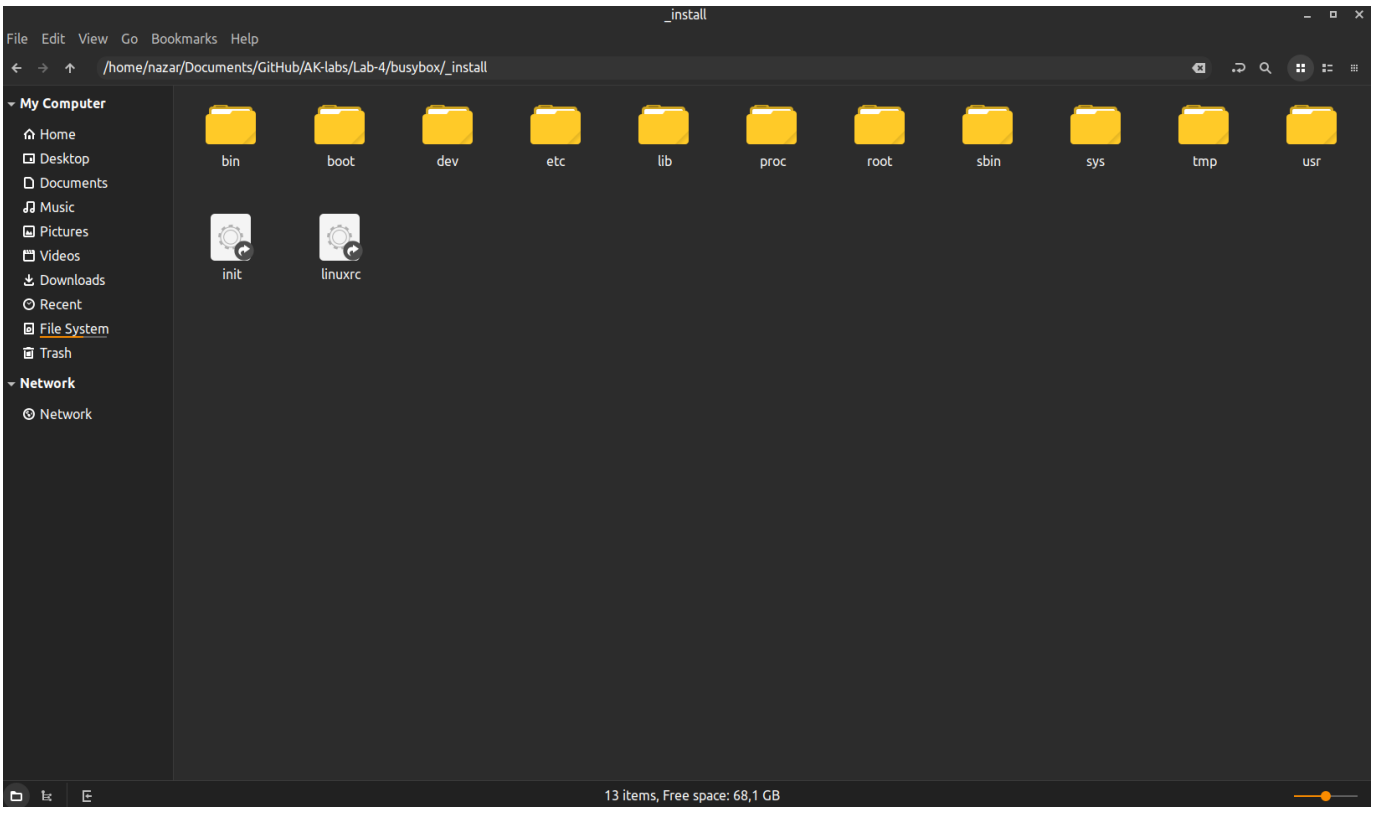

Lab-4
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
busybox
linux-stable
u-boot
3 items, Free space: 68,1 GB

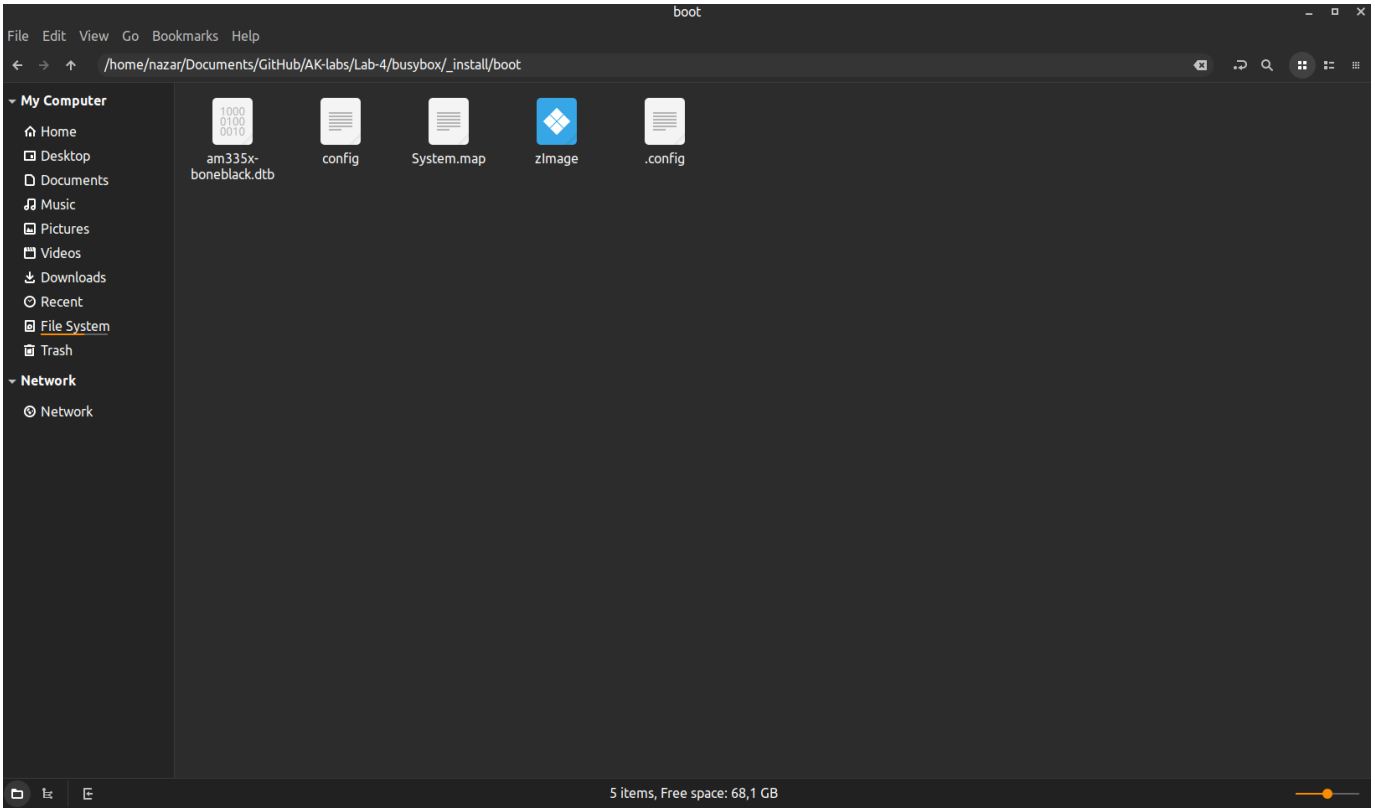

busybox
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4/busybox
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
applets
applets_sh
arch
archival
configs
console-tools
coreutils
debianutils
docs
e2fsprogs
editors
examples
findutils
include
init
_install
klibc-utils
libbb
libpwdgrp
loginutils
mailutils
miscutils
modutils
networking
printutils
procps
qemu_multiarch_testing
runit
scripts
selinux
shell
sysklogd
testsuite
util-linux
.git
.tmp_versions
AUTHORS
busybox
busybox.links
busybox_unstripped
busybox_unstripped.map
busybox_unstripped.out
Config.in
INSTALL
LICENSE
Makefile
Makefile.custom
Makefile.flags
Makefile.help
make_single_applets.sh
NOFORK_NOEXEC.lst
NOFORK_NOEXEC.sh
README
rootfs.cpio.gz
size_single_applets.sh
TODO
TODO_unicode
.busybox_unstripped.cmd
.config
.gitignore
.indent.pro
.kconfig.d
.kernelrelease
63 items, Free space: 68,1 GB

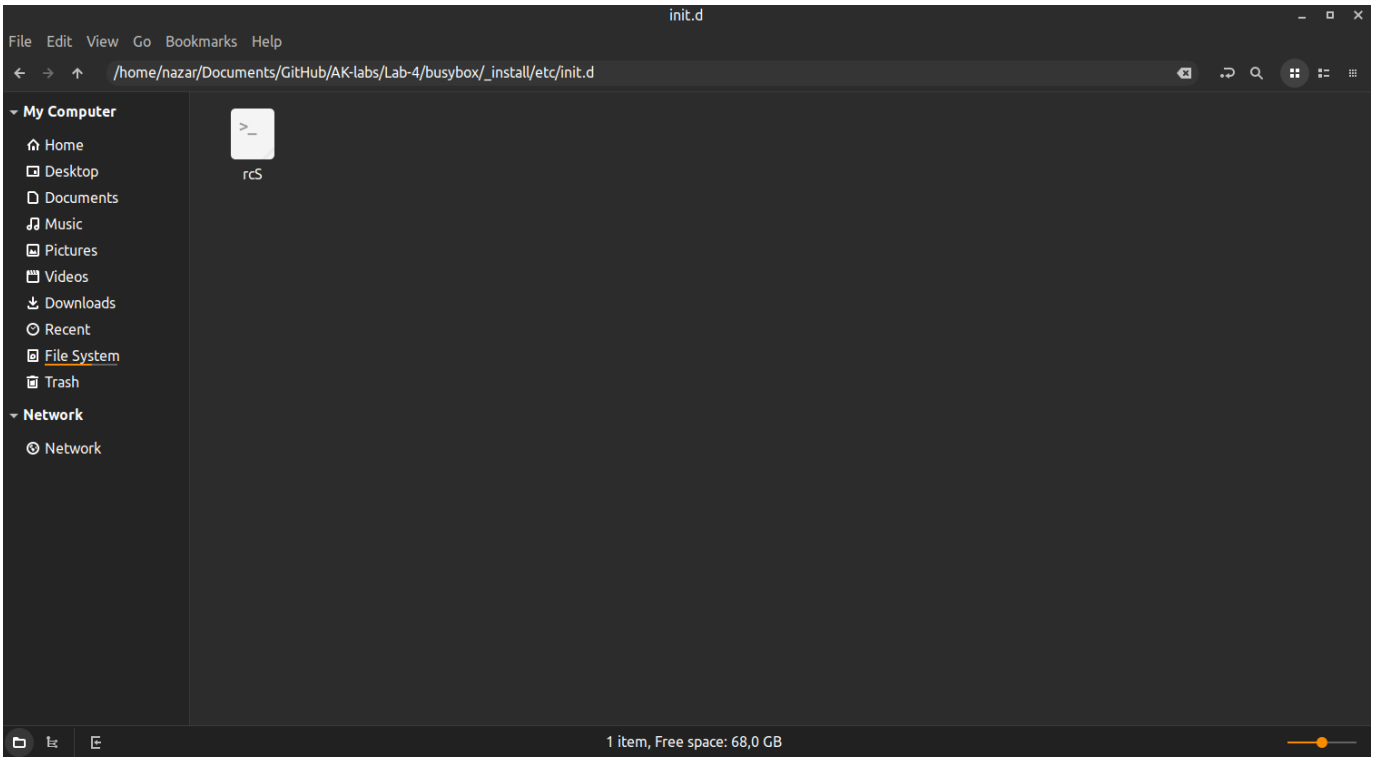

linux-stable
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4/linux-stable
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
arch
block
certs
crypto
Documentation
drivers
firmware
fragments
fs
include
init
ipc
kernel
lib
LICENSES
mm
net
samples
scripts
security
sound
tools
usr
virt
.git
.tmp_versions
built-in.a
COPYING
CREDITS
Kbuild
Kconfig
MAINTAINERS
Makefile
Module.symvers
modules.builtin
modules.order
README
System.map
vmlinux
vmlinux.o
.clang-format
.cocciconfig
.config
.get_maintainer.ignore
.gitattributes
.gitignore
.mailmap
.missing-syscalls.d
.tmp_kallsyms1.o
.tmp_kallsyms1.S
.tmp_kallsyms2.o
.tmp_kallsyms2.S
.tmp_System.map
.tmp_vmlinux1
.tmp_vmlinux2
.version
.vmlinux.cmd
57 items, Free space: 68,1 GB

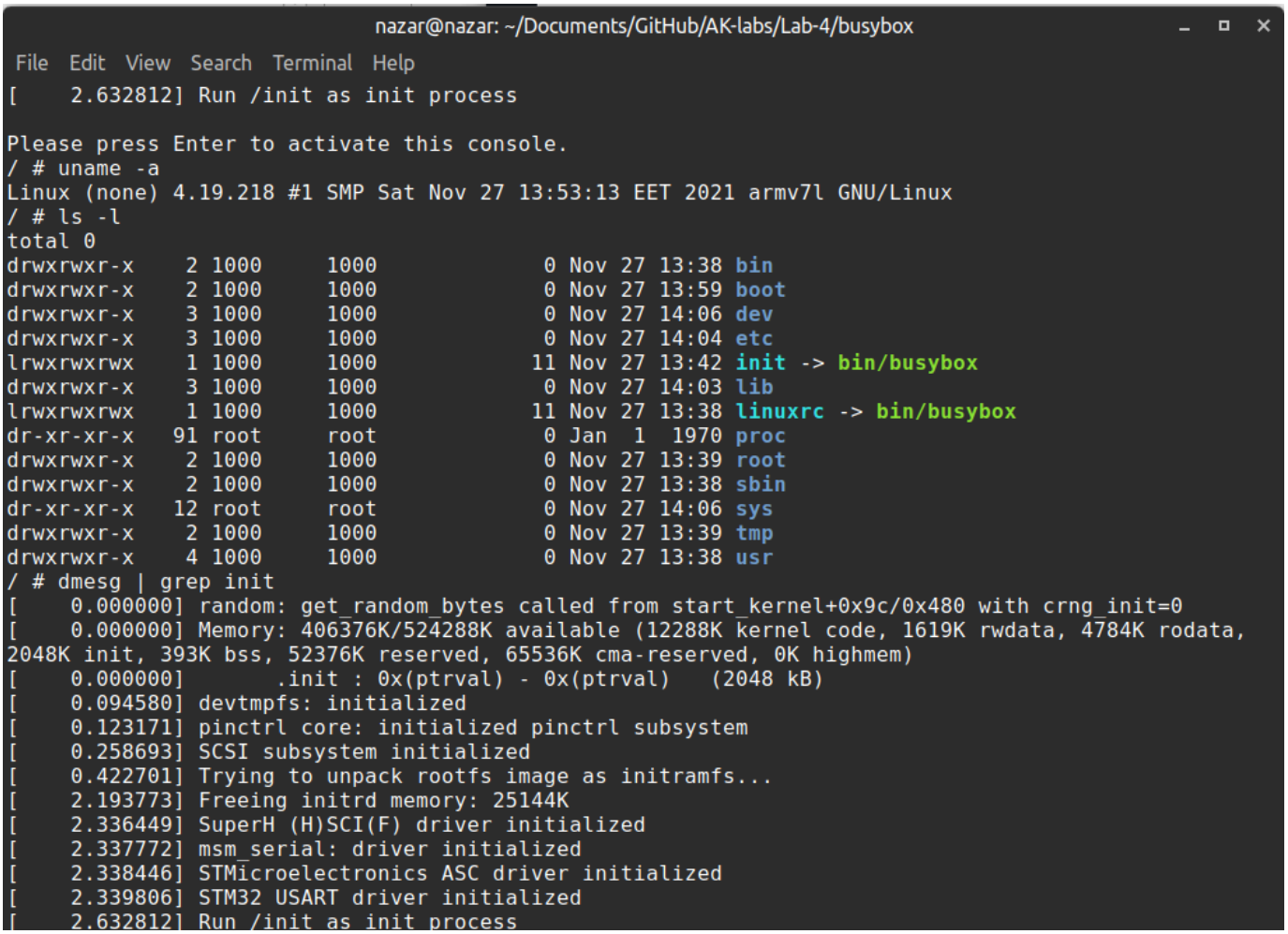

u-boot
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4/u-boot
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
api
arch
board
cmd
common
configs
disk
doc
drivers
dts
env
examples
fs
include
lib
Licenses
net
post
scripts
spl
test
tools
.git
.github
config.mk
Kbuild
Kconfig
MAINTAINERS
Makefile
MLO
MLO.byteswap
README
System.map
u-boot
u-boot.bin
u-boot.cfg
u-boot.cfg.configs
u-boot.dtb
u-boot.img
u-boot.lds
u-boot.map
u-boot.srec
u-boot.sym
u-boot-dtb.bin
u-boot-dtb.img
u-boot-nodtb.bin
.azure-pipelines.yml
.binman_stamp
.checkpatch.conf
.config
.config.old
.gitattributes
.gitignore
.gitlab-ci.yml
.mailmap
.MLO.byteswap.cmd
.MLO.cmd
.readthedocs.yml
.u-boot.bin.cmd
.u-boot.cmd
.u-boot.img.cmd
.u-boot.lds.cmd
.u-boot.srec.cmd
.u-boot.sym.cmd
.u-boot-dtb.bin.cmd
.u-boot-dtb.img.cmd
.u-boot-nodtb.bin.cmd
67 items, Free space: 68,1 GB

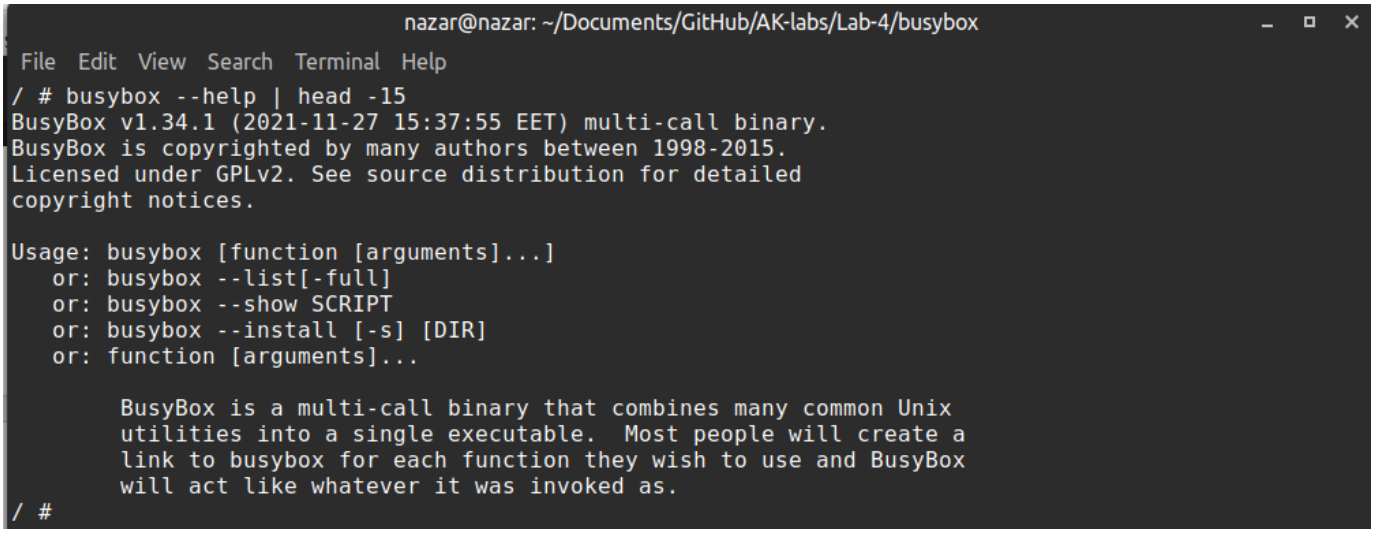

fragments
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4/linux-stable/fragments
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
bbb.cfg
1 item, Free space: 68,0 GB


_install
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4/busybox/_install
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
bin
boot
dev
etc
lib
proc
root
sbin
sys
tmp
usr
init
linuxrc
13 items, Free space: 68,1 GB


boot
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4/busybox/_install/boot
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
am335x-boneblack.dtb
config
System.map
zImage
.config
5 items, Free space: 68,1 GB


init.d
File Edit View Go Bookmarks Help
/home/nazar/Documents/GitHub/AK-labs/Lab-4/busybox/_install/etc/init.d
My Computer
Home
Desktop
Documents
Music
Pictures
Videos
Downloads
Recent
File System
Trash
Network
Network
rcS
1 item, Free space: 68,0 GB


nazar@nazar: ~/Documents/GitHub/AK-labs/Lab-4/busybox
File Edit View Search Terminal Help
[2.632812] Run /init as init process
Please press Enter to activate this console.
/ # uname -a
Linux (none) 4.19.218 #1 SMP Sat Nov 27 13:53:13 EET 2021 armv7l GNU/Linux
/ # ls -l
total 0
drwxrwxr-x 2 1000 1000 0 Nov 27 13:38 bin
drwxrwxr-x 2 1000 1000 0 Nov 27 13:59 boot
drwxrwxr-x 3 1000 1000 0 Nov 27 14:06 dev
drwxrwxr-x 3 1000 1000 0 Nov 27 14:04 etc
lrwxrwxrwx 1 1000 1000 11 Nov 27 13:42 init -> bin/busybox
drwxrwxr-x 3 1000 1000 0 Nov 27 14:03 lib
lrwxrwxrwx 1 1000 1000 11 Nov 27 13:38 linuxrc -> bin/busybox
dr-xr-xr-x 91 root root 0 Jan 1 1970 proc
drwxrwxr-x 2 1000 1000 0 Nov 27 13:39 root
drwxrwxr-x 2 1000 1000 0 Nov 27 13:38 sbin
dr-xr-xr-x 12 root root 0 Nov 27 14:06 sys
drwxrwxr-x 2 1000 1000 0 Nov 27 13:39 tmp
drwxrwxr-x 4 1000 1000 0 Nov 27 13:38 usr
/ # dmesg | grep init
[0.000000] random: get_random_bytes called from start_kernel+0x9c/0x480 with crng_init=0
[0.000000] Memory: 406376K/524288K available (12288K kernel code, 1619K rwdata, 4784K rodata, 2048K init, 393K bss, 52376K reserved, 65536K cma-reserved, 0K highmem)
[0.000000] .init : 0x(ptrval) - 0x(ptrval) (2048 kB)
[0.094580] devtmpfs: initialized
[0.123171] pinctrl core: initialized pinctrl subsystem
[0.258693] SCSI subsystem initialized
[0.422701] Trying to unpack rootfs image as initramfs...
[2.193773] Freeing initrd memory: 25144K
[2.336449] SuperH (H)SCI(F) driver initialized
[2.337772] msm_serial: driver initialized
[2.338446] STMicroelectronics ASC driver initialized
[2.339806] STM32 USART driver initialized
[2.632812] Run /init as init process


nazar@nazar: ~/Documents/GitHub/AK-labs/Lab-4/busybox
File Edit View Search Terminal Help
/ # busybox --help | head -15
BusyBox v1.34.1 (2021-11-27 15:37:55 EET) multi-call binary.
BusyBox is copyrighted by many authors between 1998-2015.
Licensed under GPLv2. See source distribution for detailed
copyright notices.
Usage: busybox [function [arguments]...]
or: busybox --list[-full]
or: busybox --show SCRIPT
or: busybox --install [-s] [DIR]
or: function [arguments]...
BusyBox is a multi-call binary that combines many common Unix
utilities into a single executable. Most people will create a
link to busybox for each function they wish to use and BusyBox
will act like whatever it was invoked as.
/ #