环境: VMware Workstation Pro 17 +debian-12.2.0-amd64

作业1:编译Linux内核

进入 Linux 文件夹,使用如下命令进行编译:

make x86 64 defconfig

```
yzhang@debian: ~/cicv-r4l-aescnczy/busybox-1.36.1
                                                                     Q
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux# rustup component add rustfmt
info: component 'rustfmt' for target 'x86_64-unknown-linux-gnu' is up to date
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux# rustup component add clippy
info: component 'clippy' for target 'x86_64-unknown-linux-gnu' is up to date
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux# make LLVM=1 rustavailable
Rust is available!
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux# make x86_64_defconfig
  HOSTCC scripts/basic/fixdep
  HOSTCC scripts/kconfig/conf.o
         scripts/kconfig/confdata.o
  HOSTCC scripts/kconfig/expr.o
  LEX
          scripts/kconfig/lexer.lex.c
  YACC
          scripts/kconfig/parser.tab.[ch]
  HOSTCC scripts/kconfig/lexer.lex.o
  HOSTCC
         scripts/kconfig/menu.o
  HOSTCC
          scripts/kconfig/parser.tab.o
  HOSTCC
         scripts/kconfig/preprocess.o
  HOSTCC
         scripts/kconfig/symbol.o
  HOSTCC
          scripts/kconfig/util.o
  HOSTLD scripts/kconfig/conf
  configuration written to .config
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux#
```

make LLVM=1 menuconfig

```
\oplus
                                                                       Q
                      yzhang@debian: ~/cicv-r4l-aescnczy/busybox-1.36.1
                                                                            \equiv
  HOSTCC
          scripts/kconfig/util.o
  HOSTLD
          scripts/kconfig/conf
# configuration written to .config
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux# make LLVM=1 menuconfig
  HOSTCC scripts/basic/fixdep
          scripts/kconfig/confdata.o
  HOSTCC
          scripts/kconfig/expr.o
  HOSTCC
          scripts/kconfig/lexer.lex.o
  HOSTCC
          scripts/kconfig/menu.o
  HOSTCC
          scripts/kconfig/parser.tab.o
          scripts/kconfig/preprocess.o
  HOSTCC
          scripts/kconfig/symbol.o
  HOSTCC
          scripts/kconfig/util.o
  UPD
          scripts/kconfig/mconf-cfg
  HOSTCC
          scripts/kconfig/mconf.o
  HOSTCC
          scripts/kconfig/lxdialog/checklist.o
  HOSTCC
          scripts/kconfig/lxdialog/inputbox.o
  HOSTCC
          scripts/kconfig/lxdialog/menubox.o
          scripts/kconfig/lxdialog/textbox.o
  HOSTCC
          scripts/kconfig/lxdialog/util.o
  HOSTCC
  HOSTCC
          scripts/kconfig/lxdialog/yesno.o
          scripts/kconfig/mconf
  HOSTLD
configuration written to
  * End of the configuration.
*** Execute
                   to start the build or try 'make help'.
            'make'
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux#
```

#set the following config to yes

General setup

---> [*] Rust support

```
\oplus
                      yzhang@debian: ~/cicv-r4l-aescnczy/busybox-1.36.1
                                                                            Q
                                                                                 \equiv
                                   General setup
   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>
exit, <?> for Help, </>> for Search. Legend: [*] built-in [ ]
                                                              Press <Esc><Esc> to
        [*]
               Support initial ramdisk/ramfs compressed using LZ4
               Support initial ramdisk/ramfs compressed using ZSTD
            Boot config support
        [*] Preserve cpio archive mtimes in initramfs
             Compiler optimization level (Optimize for performance (-02))
            Configure standard kernel features (expert users)
            Embedded system
            Kernel Performance Events And Counters
             Profiling support
        [*] Rust support
                        < Exit >
                                      < Help >
                                                                 < Load >
```

make LLVM=1 -j\$(nproc)

```
\oplus
                      yzhang@debian: ~/cicv-r4l-aescnczy/busybox-1.36.1
  \mathsf{CC}
          arch/x86/boot/compressed/idt_64.o
          arch/x86/boot/compressed/idt_handlers_64.o
  AS
  AS
          arch/x86/boot/compressed/mem_encrypt.o
  CC
          arch/x86/boot/compressed/pgtable_64.o
  \mathsf{CC}
          arch/x86/boot/compressed/acpi.o
  AS
          arch/x86/boot/compressed/efi_thunk_64.o
  CC
          arch/x86/boot/compressed/efi.o
  CC
          arch/x86/boot/compressed/misc.o
  GZIP
          arch/x86/boot/compressed/vmlinux.bin.gz
  MKPIGGY arch/x86/boot/compressed/piggy.S
          arch/x86/boot/compressed/piggy.o
  AS
          arch/x86/boot/compressed/vmlinux
  ZOFFSET arch/x86/boot/zoffset.h
  OBJCOPY arch/x86/boot/vmlinux.bin
          arch/x86/boot/header.o
  AS
  LD
          arch/x86/boot/setup.elf
  OBJCOPY arch/x86/boot/setup.bin
  BUTLD
          arch/x86/boot/bzImage
Kernel: arch/x86/boot/bzImage is ready (#1)
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux# ls
arch
                          LICENSES
                                                     README
                                                     README.md
block
               include
                          MAINTAINERS
                                                                  virt
built-in.a
                          Makefile
                                                                  vmlinux
                init
                                                     rust
                                                                  vmlinux.a
certs
               io uring
                          mm
                                                     samples
COPYING
                          modules.builtin
                                                     scripts
                                                                  vmlinux.o
                ipc
CREDITS
               Kbuild
                          modules.builtin.modinfo
                                                     security
crypto
               Kconfig
                          modules.order
                                                     sound
Documentation
               kernel
                          Module.symvers
                                                     System.map
drivers
               lib
                          net
                                                     tools
root@debian:/home/yzhang/cicv-r4l-aescnczy/linux#
```

在最后你将在 Linux 文件夹下,得到一个 vmlinux 的文件,那么就算成功了

