CSE2005 – Operating System

LAB EXERCISE-4

KERNEL COMPILATION
ILAKKIYA V – 19BCE1699

Packages installed:

sudo apt-get update:

```
ilakkiya@ilakkiya:~$ sudo apt-get update
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security InRelease [109 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal-updates/main i386 Packages [436
 kB]
```

sudo apt-get install git:

```
ilakkiya@ilakkiya:~$ sudo apt-get install git
Reading package lists... Done
Building dependency tree
```

sudo apt-get install fakeroot:

```
ilakkiya@ilakkiya:~$ sudo apt-get install fakeroot
Reading package lists... Done
Building dependency tree
Reading state information... Done
fakeroot is already the newest version (1.24-1).
fakeroot set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 436 not upgraded.
```

sudo apt-get install build-essential:

```
ilakkiya@ilakkiya:~$ sudo apt-get install build-essential
Reading package lists... Done
Building dependency tree
Reading state information... Done
build-essential is already the newest version (12.8ubuntu1.1).
0 upgraded, 0 newly installed, 0 to remove and 436 not upgraded.
```

sudo apt-get install rsync:

```
ilakkiya@ilakkiya:~$ sudo apt-get install rsync
Reading package lists... Done
Building dependency tree
Reading state information... Done
rsync is already the newest version (3.1.3-8).
rsync set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 436 not upgraded.
```

sudo apt-get install gcc:

```
ilakkiya@ilakkiya:~$ sudo apt-get install gcc
Reading package lists... Done
Building dependency tree
Reading state information... Done
gcc is already the newest version (4:9.3.0-1ubuntu2).
gcc set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 436 not upgraded.
```

sudo apt-get install bc:

```
ilakkiya@ilakkiya:~$ sudo apt-get install bc
Reading package lists... Done
Building dependency tree
Reading state information... Done
bc is already the newest version (1.07.1-2build1).
bc set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 436 not upgraded.
```

sudo apt-get install bison:

```
ilakkiya@ilakkiya:~$ sudo apt-get install bison
Reading package lists... Done
Building dependency tree
```

sudo apt-get install libncurses-dev:

```
ilakkiya@ilakkiya:~$ sudo apt-get install libncurses-dev
Reading package lists... Done
Building dependency tree
```

sudo apt-get install xz-utils:

```
ilakkiya@ilakkiya:~$ sudo apt-get install xz-utils
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

sudo apt-get install libssl-dev:

```
ilakkiya@ilakkiya:~$ sudo apt-get install libssl-dev
Reading package lists... Done
Building dependency tree
```

sudo apt-get install libelf-dev:

```
ilakkiya@ilakkiya:~$ sudo apt-get install libelf-dev
Reading package lists... Done
Building dependency tree
```

Update the grub:

```
ilakkiya@ilakkiya:~$ sudo update-grub
Sourcing file `/etc/default/grub'
Sourcing file `/etc/default/grub.d/init-select.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-5.8.0-43-generic
Found initrd image: /boot/initrd.img-5.8.0-43-generic
Found linux image: /boot/vmlinuz-5.4.0-26-generic
Found initrd image: /boot/initrd.img-5.4.0-26-generic
Found memtest86+ image: /boot/memtest86+.elf
Found memtest86+ image: /boot/memtest86+.bin
done
```

Download and extract the latest kernel source:

wget link_address(paste the link address here) AND mkdir:

```
ilakkiya@ilakkiya:~$ wget https://git.kernel.org/torvalds/t/linux-5.12-rc2.tar.
gz
--2021-03-14 13:39:13--  https://git.kernel.org/torvalds/t/linux-5.12-rc2.tar.g
z
Resolving git.kernel.org (git.kernel.org)... 147.75.46.191, 2604:1380:4080:c00:
:1
Connecting to git.kernel.org (git.kernel.org)|147.75.46.191|:443... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/sn
apshot/linux-5.12-rc2.tar.gz [following]
--2021-03-14 13:39:14--  https://git.kernel.org/pub/scm/linux/kernel/git/torval
ds/linux.git/snapshot/linux-5.12-rc2.tar.gz
Reusing existing connection to git.kernel.org:443.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/x-gzip]
Saving to: 'linux-5.12-rc2.tar.gz'

linux-5.12-rc2.tar.    [    <=>             ] 181.47M   573KB/s    in 6m 15s

2021-03-14 13:45:29 (495 KB/s) - 'linux-5.12-rc2.tar.gz' saved [190289913]

ilakkiya@ilakkiya:~$ mkdir LinuxKernel
```

tar xvf linux-* -C LinuxKernel/ --strip –components=1 AND cd linuxkernel:

```
ilakkiya@ilakkiya:~$ cd linuxkernel
ilakkiya@ilakkiya:~/linuxkernel$ ls
arch       CREDITS        fs         Kbuild    LICENSES     net       security  virt
block      crypto         include    Kconfig   MAINTAINERS  README    sound
certs      Documentation  init       kernel    Makefile     samples   tools
COPYING    drivers        ipc        lib       mm           scripts   usr
```

Configure the kernel compilation:

cp /boot/config-$(uname –r) ./.config:

```
ilakkiya@ilakkiya:~/linuxkernel$ cp /boot/config-5.8.0-44-generic ./.config
ilakkiya@ilakkiya:~/linuxkernel$ make menuconfig
  HOSTCC   scripts/basic/fixdep
  UPD      scripts/kconfig/mconf-cfg
  HOSTCC   scripts/kconfig/mconf.o
  HOSTCC   scripts/kconfig/lxdialog/checklist.o
```

Make command:

make deb-pkg (completion of that command):

```
 dpkg-genbuildinfo
 dpkg-genchanges  >../linux-5.12.0-rc3_5.12.0-rc3-1_amd64.changes
dpkg-genchanges: info: including full source code in upload
 dpkg-source -i.git --after-build .
dpkg-buildpackage: info: full upload (original source is included)
```

cd AND sudo dpkg –i linux-*.deb:

```
ilakkiya@ilakkiya:~$ sudo dpkg -i linux-*.deb
[sudo] password for ilakkiya:
Selecting previously unselected package linux-headers-5.12.0-rc3.
(Reading database ... 187661 files and directories currently installed.)
```

Reboot and verify:

sudo shutdown –r now:

```
ilakkiya@ilakkiya:~$ sudo shutdown -r now
```

uname -r:

```
ilakkiya@ilakkiya:~$ uname -r
5.12.0-rc3
```