



LABORATORIUM PEMBELAJARAN ILMU KOMPUTER FAKULTAS ILMU KOMPUTER UNIVERSITAS BRAWIJAYA

NAMA : ADIN RAMA ARIYANTO PUTRA
NIM : 215150601111005
MATERI : BAB II
TANGGAL : 08/03/2022
ASISTEN : RICKO ANGGORO PUTRA YUSTONO

2.1 Kebutuhan

2.2 Tujuan Praktikum

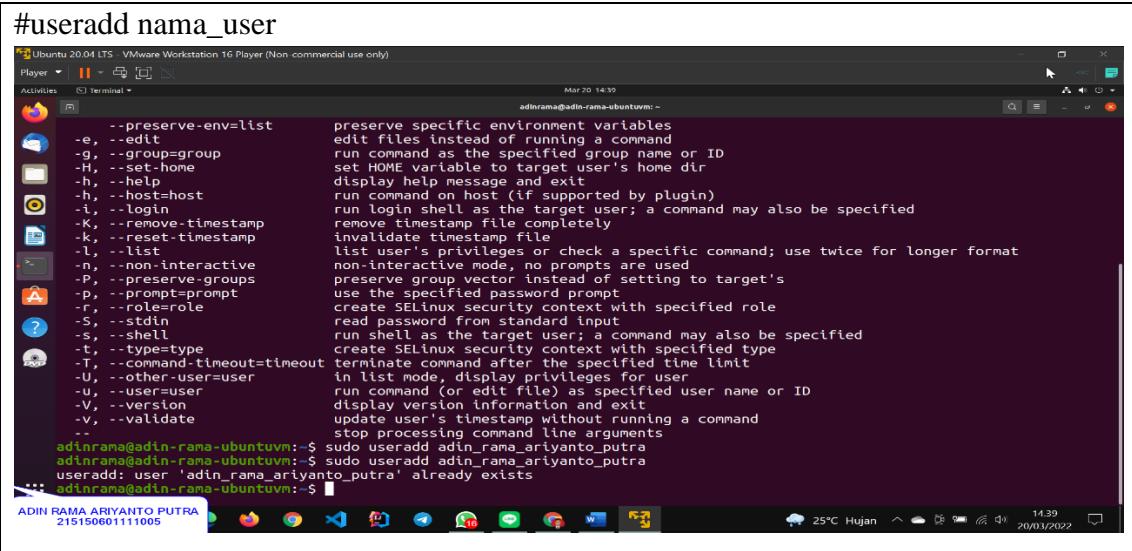
2.3 Materi Praktikum

2.3.1 Command Line Interface

A. Manajemen User dan Group

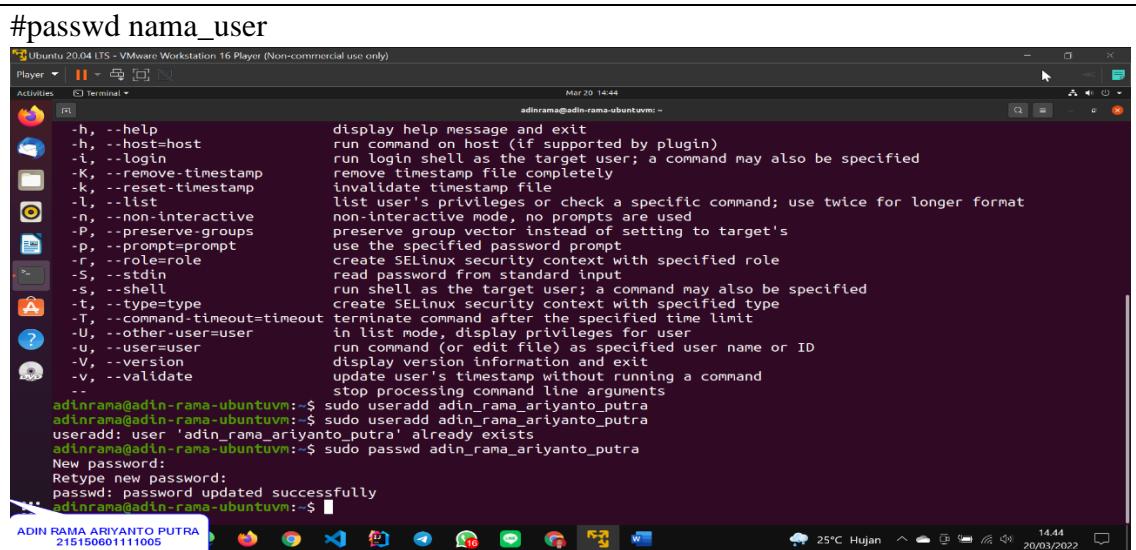
- Membuat user

```
#useradd nama_user
```



- Mengganti password

```
#passwd nama_user
```



• Menghapus user

```
#userdel nama_user
```

The terminal window shows the help documentation for the userdel command and two examples of its use:

```

userdel [-h, --host=host] [-i, --login]
         [-K, --remove-timestamp]
         [-k, --reset-timestamp]
         [-l, --list]
         [-n, --non-interactive]
         [-P, --preserve-groups]
         [-p, --prompt=prompt]
         [-r, --role=role]
         [-S, --stdin]
         [-s, --shell]
         [-t, --type=type]
         [-T, --command-timeout=timeout]
         [-U, --other-user=user]
         [-u, --user=user]
         [-V, --version]
         [-v, --validate]
         [-]
run command on host (if supported by plugin)
run login shell as the target user; a command may also be specified
remove timestamp file completely
invalidate timestamp file
list user's privileges or check a specific command; use twice for longer format
non-interactive mode, no prompts are used
preserve group vector instead of setting to target's
use the specified password prompt
create SELinux security context with specified role
read password from standard input
run shell as the target user; a command may also be specified
create SELinux security context with specified type
terminate command after the specified time limit
in list mode, display privileges for user
run command (or edit file) as specified user name or ID
display version information and exit
update user's timestamp without running a command
stop processing command line arguments

adinrama@adin-rama-ubuntuvm:~$ sudo useradd adin_rama_ariyanto_putra
adinrama@adin-rama-ubuntuvm:~$ sudo userdel adin_rama_ariyanto_putra
useradd: user 'adin_rama_ariyanto_putra' already exists
adinrama@adin-rama-ubuntuvm:~$ sudo passwd adin_rama_ariyanto_putra
New password:
Retype new password:
passwd: password updated successfully
adinrama@adin-rama-ubuntuvm:~$ sudo userdel adin_rama_ariyanto_putra
adinrama@adin-rama-ubuntuvm:~$ 
```

atau

```
#userdel -r nama_user
```

The terminal window shows the help documentation for the userdel -r command and two examples of its use:

```

usbmux:x:110:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
rtkit:x:111:117:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:113:128:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:114:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
avahi:x:115:121:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
kernooops:x:116:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:117:123::/var/lib/saned:/usr/sbin/nologin
nm-openvpn:x:118:124:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
hplip:x:119:7:HPLIP system user,,,:/run/hplip:/bin/false
whoopsie:x:120:125::/nonexistent:/bin/false
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
geoclue:x:122:127::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:123:128:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:124:65534::/run/gnome-initial-setup:/bin/false
gdm:x:125:130:Gnome Display Manager:/var/lib/gdm3:/bin/false
sssd:x:126:131:SSSD system user,,,:/var/lib/sssd:/usr/sbin/nologin
adinramax:x:1000:1000:Adin Rama Ariyanto Putra,,,:/home/adinrama:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
adin_rama:x:1001:1001:/home/adin_rama:/bin/sh
adinrama@adin-rama-ubuntuvm:~$ userdel -r adin_rama
userdel: Permission denied.
userdel: cannot lock /etc/passwd; try again later.
adinrama@adin-rama-ubuntuvm:~$ sudo userdel -r adin_rama
userdel: adin_rama mail spool (/var/mail/adin_rama) not found
userdel: adin_rama home directory (/home/adin_rama) not found
adinrama@adin-rama-ubuntuvm:~$ 
```

Jelaskan perbedaan kedua syntax diatas !

#userdel nama_user digunakan untuk menghapus user tetapi direktori home, mail, dan file lainnya tidak akan terhapus.

#userdel -r nama_user digunakan untuk menghapus user beserta semua berkas file yang berada pada home nya meskipun user dalam keadaan terkoneksi kedalam sistem.

- Membuat group

```
#groupadd nama_group
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal session starts with the command `cd`, followed by `groupadd adinramaap`. The output indicates that permission was denied and that the command failed because it could not lock the /etc/group file. A subsequent attempt to run the command with `sudo` also fails due to a password requirement. The terminal prompt ends with a colon and a dash.

- Mengubah password group

```
#gpasswd nama_group
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal session starts with the command `groupadd adinramaap`, which fails due to permission denial and inability to lock the /etc/group file. A subsequent attempt to run the command with `sudo` succeeds, and the terminal prompts for a new password for the group. The user enters a password, and the terminal displays a confirmation message. The terminal prompt ends with a colon and a dash.

- Menghapus group

```
#groupdel nama_group
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal session starts with the command `groupadd adinramaap`, which fails due to permission denial and inability to lock the /etc/group file. A subsequent attempt to run the command with `sudo` succeeds, and the terminal prompts for a new password for the group. The user enters a password, and the terminal displays a confirmation message. The terminal prompt ends with a colon and a dash.

B. File dan Direktori

- Operasi pada file
 - 1. Membuat file

```
$ touch sisop
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal window has a dark background with white text. The command \$ touch sisop is entered, followed by \$ ls which lists the directory contents. The desktop environment is visible in the background, showing icons for various applications like a browser, file manager, and system tools. The status bar at the bottom shows the user's name as adinrama@adin-rama-ubuntuvm:~ and the date and time as Mar 20 15:31.

```
$ touch home/praktikum/sisop
```

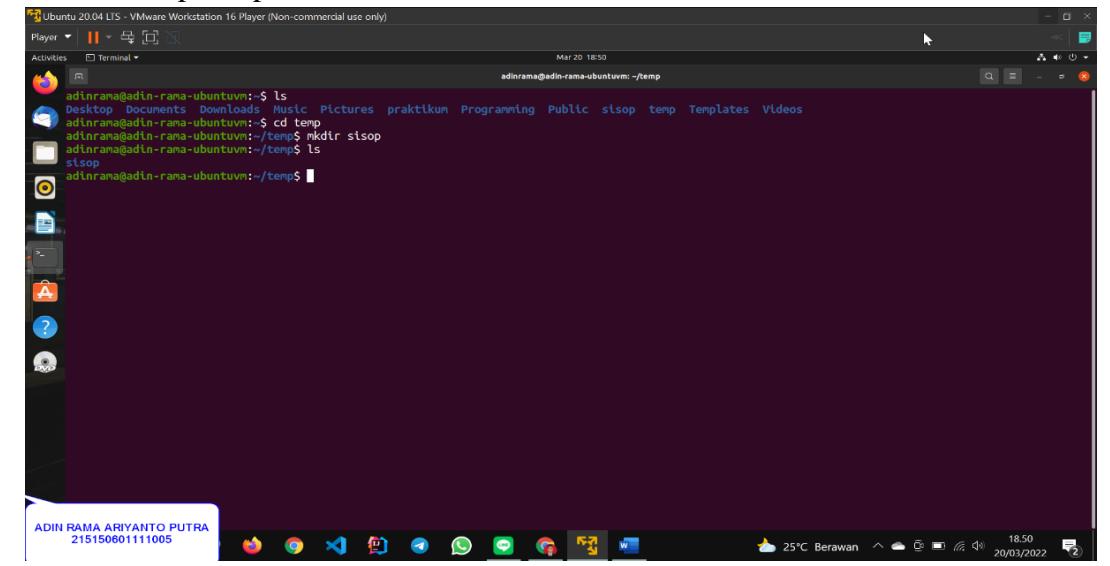
The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal window has a dark background with white text. The command \$ touch home/praktikum/sisop is entered, but since the directory does not exist, it results in an error message: "touch: cannot touch 'home/praktikum/sisop': No such file or directory". The desktop environment is visible in the background, showing icons for various applications like a browser, file manager, and system tools. The status bar at the bottom shows the user's name as adinrama@adin-rama-ubuntuvm:~ and the date and time as Mar 20 18:45.

2. Membuat direktori

```
$ mkdir sisop
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal window has a dark background with white text. The command \$ mkdir sisop is entered, followed by \$ ls which lists the directory contents. The new directory "sisop" is now listed among the others. The desktop environment is visible in the background, showing icons for various applications like a browser, file manager, and system tools. The status bar at the bottom shows the user's name as adinrama@adin-rama-ubuntuvm:~ and the date and time as Mar 20 18:48.

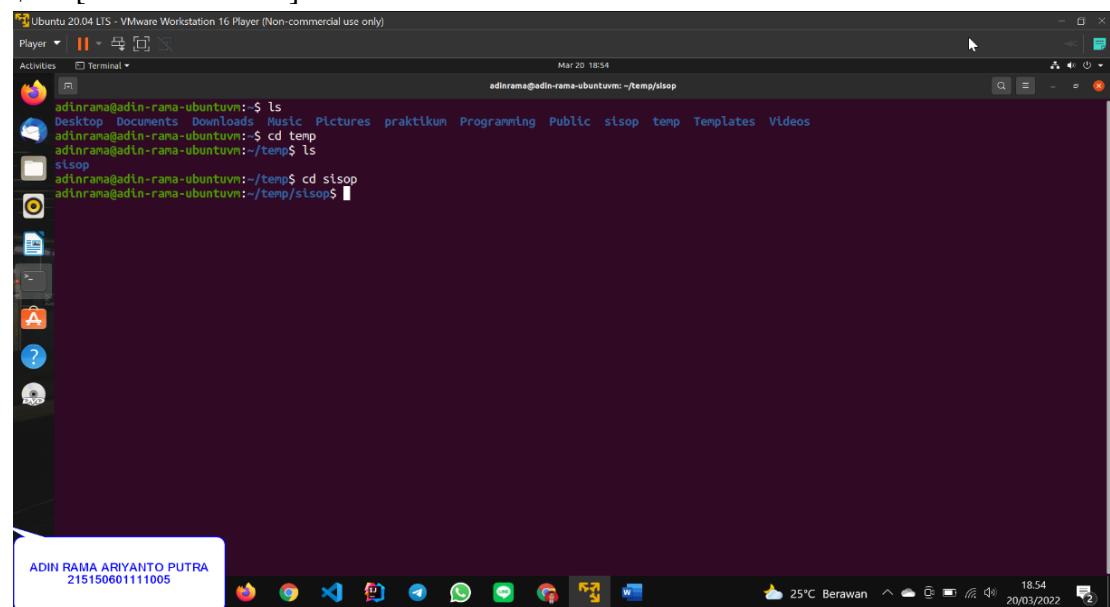
```
$ mkdir /temp/sisop
```



```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 18:50
adinrama@adin-rama-ubuntuvm:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntuvm:~$ cd temp
adinrama@adin-rama-ubuntuvm:~/temp$ mkdir sisop
adinrama@adin-rama-ubuntuvm:~/temp$ ls
sisop
adinrama@adin-rama-ubuntuvm:~/temp$
```

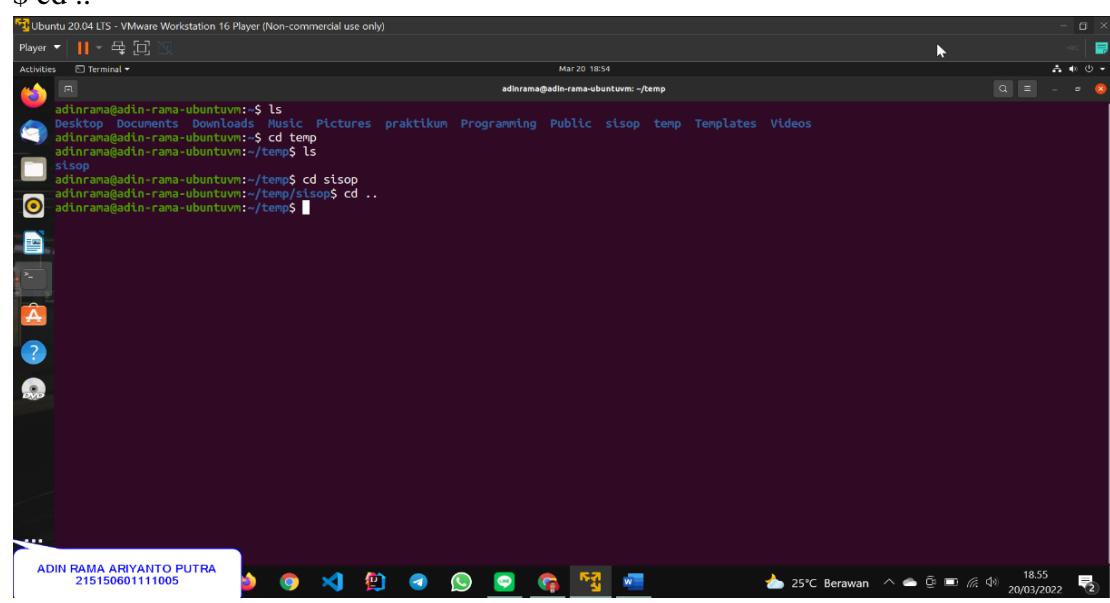
3. Berpindah direktori

```
$ cd [alamat direktori]
```



```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 18:54
adinrama@adin-rama-ubuntuvm:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntuvm:~$ cd temp
adinrama@adin-rama-ubuntuvm:~/temp$ ls
sisop
adinrama@adin-rama-ubuntuvm:~/temp$ cd sisop
adinrama@adin-rama-ubuntuvm:~/temp/sisop$
```

```
$ cd ..
```



```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 18:54
adinrama@adin-rama-ubuntuvm:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntuvm:~$ cd temp
adinrama@adin-rama-ubuntuvm:~/temp$ ls
sisop
adinrama@adin-rama-ubuntuvm:~/temp$ cd sisop
adinrama@adin-rama-ubuntuvm:~/temp/sisop$ cd ..
adinrama@adin-rama-ubuntuvm:~/temp$
```

4. Mendapatkan nama direktori terkini

```
$ pwd
```

A screenshot of a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal shows the following session:

```
adlnrama@adin-rama-ubuntuvn:~$ ls
adlnrama@adin-rama-ubuntuvn:~$ cd temp
adlnrama@adin-rama-ubuntuvn:~/temp$ ls
adlnrama@adin-rama-ubuntuvn:~/temp$ cd ..
adlnrama@adin-rama-ubuntuvn:~/temp$ cd
adlnrama@adin-rama-ubuntuvn:~$ pwd
/home/adlnrama
adlnrama@adin-rama-ubuntuvn:~$
```

The desktop environment visible in the background includes icons for a browser, file manager, and system tray with network and battery status.

5. List direktori

```
$ ls [option]
```

A screenshot of a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal shows the following session:

```
adlnrama@adin-rama-ubuntuvn:~$ ls
adlnrama@adin-rama-ubuntuvn:~$ cd temp
adlnrama@adin-rama-ubuntuvn:~/temp$ ls
adlnrama@adin-rama-ubuntuvn:~/temp$ cd ..
adlnrama@adin-rama-ubuntuvn:~/temp$ cd
adlnrama@adin-rama-ubuntuvn:~$ pwd
/home/adlnrama
adlnrama@adin-rama-ubuntuvn:~$ ls -l
total 48
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Desktop
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Documents
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Downloads
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Music
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Pictures
drwxrwxr-x 2 adlnrama adlnrama 4096 Mar 20 18:44 praktikum
drwxrwxr-x 5 adlnrama adlnrama 4096 Mar 18 07:05 Programming
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Public
drwxrwxr-x 2 adlnrama adlnrama 4096 Mar 20 18:47 sisop
drwxrwxr-x 3 adlnrama adlnrama 4096 Mar 20 18:50 temp
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adlnrama adlnrama 4096 Mar 7 21:37 Videos
adlnrama@adin-rama-ubuntuvn:~$
```

The desktop environment visible in the background includes icons for a browser, file manager, and system tray with network and battery status.

Option	Fungsi
-a	Menampilkan semua file dan folder, termasuk file dan folder yang tersembunyi
-A	Sama dengan -a, tetapi tidak menampilkan direktori
-C	Menampilkan direktori dengan output berbentuk kolom
-d	Menampilkan direktori saja, isi direktori tidak ditampilkan
-f	Menampilkan isi direktori tanpa diurutkan

-1	Menampilkan isi direktori secara lengkap, mulai dari hak akses, owner, group, dan tanggal file atau direktori tersebut dibuat
-1	Menampilkan isi direktori dengan format satu direktori per baris

6. Copy berkas

```
$ cp /[direktori]/[file_yang_ingin_dicopy]/[direktori tujuan]
```

```

drwxrwxr-x 5 adinrama adinrama 4096 Mar 18 07:05 Programming
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Public
drwxrwxr-x 2 adinrama adinrama 4096 Mar 20 18:47 sisop
drwxrwxr-x 3 adinrama adinrama 4096 Mar 20 18:50 temp
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Videos
adinrama@adln-rama-ubuntuvu:~/Programming$ cd Programming
adinrama@adln-rama-ubuntuvu:~/Programming$ ls
Implements Implement2 MultithreadingJava
Implements Java class Main.class Main.java
adinrama@adln-rama-ubuntuvu:~/Programming$ cd
adinrama@adln-rama-ubuntuvu:~/Programming$ cp /Programming/Main.java /sisop
cp: cannot stat '/Programming/Main.java': No such file or directory
adinrama@adln-rama-ubuntuvu:~/praktikum$ cp /sisop /praktikum
adinrama@adln-rama-ubuntuvu:~/praktikum$ ls
sisop
adinrama@adln-rama-ubuntuvu:~/praktikum$ cd
adinrama@adln-rama-ubuntuvu:~$ cp /praktikum/sisop /home
cp: cannot stat '/praktikum/sisop': No such file or directory
adinrama@adln-rama-ubuntuvu:~$ nano aku.txt
adinrama@adln-rama-ubuntuvu:~$ ls
aku.txt Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adln-rama-ubuntuvu:~$ cp /home/aku.txt /praktikum
cp: cannot stat '/home/aku.txt': No such file or directory
adinrama@adln-rama-ubuntuvu:~$ cp aku.txt praktikum
adinrama@adln-rama-ubuntuvu:~/praktikum$ ls
praktikum
ADIN RAMA ARIYANTO PUTRA ntuvu:~/praktikum$ 215150601111005

```

7. Memindah berkas

```
$ mv/[direktori]/[file_yang_ingin_dicut]/[direktori tujuan] (cut)
```

```

adinrama@adln-rama-ubuntuvu:~$ ls
aku.txt Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adln-rama-ubuntuvu:~$ cd praktikum
adinrama@adln-rama-ubuntuvu:~/praktikum$ ls
sisop
adinrama@adln-rama-ubuntuvu:~/praktikum$ cd
adinrama@adln-rama-ubuntuvu:~$ mv /home/aku.txt praktikum
mv: cannot stat '/home/aku.txt': No such file or directory
adinrama@adln-rama-ubuntuvu:~$ mv /home/aku.txt /praktikum
mv: cannot stat '/home/aku.txt': No such file or directory
adinrama@adln-rama-ubuntuvu:~$ mv aku.txt praktikum
adinrama@adln-rama-ubuntuvu:~/praktikum$ ls
aku.txt sisop
adinrama@adln-rama-ubuntuvu:~/praktikum$ ls
aku.txt sisop
ADIN RAMA ARIYANTO PUTRA ntuvu:~/praktikum$ 215150601111005

```

```
$ mv/[direktori]/[file_yang_ingin_direname]/[nama_baru_file] (rename)
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non commercial use only)". The terminal session starts with:

```
adinrama@adin-rama-ubuntu:~$ ls
aku.txt Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntu:~$ cd praktikum
adinrama@adin-rama-ubuntu:~/praktikum$ ls
sisop
adinrama@adin-rama-ubuntu:~/praktikum$ cd ..
adinrama@adin-rama-ubuntu:~$ mv ~/aku.txt praktikum
mv: cannot stat '/home/aku.txt': No such file or directory
adinrama@adin-rama-ubuntu:~$ mv /home/aku.txt ~/praktikum
mv: cannot stat '/home/aku.txt': No such file or directory
adinrama@adin-rama-ubuntu:~$ cd praktikum
adinrama@adin-rama-ubuntu:~/praktikum$ ls
aku.txt sisop
adinrama@adin-rama-ubuntu:~/praktikum$ cd ..
adinrama@adin-rama-ubuntu:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntu:~$ cd praktikum
adinrama@adin-rama-ubuntu:~/praktikum$ ls
aku.txt sisop
adinrama@adin-rama-ubuntu:~/praktikum$ mv aku.txt aku12.txt
adinrama@adin-rama-ubuntu:~/praktikum$ ls
aku12.txt sisop
adinrama@adin-rama-ubuntu:~/praktikum$
```

The terminal window has a dark background with light-colored text. It includes standard Linux navigation commands like ls, cd, and mv. The user's name "adinrama" and session details are visible at the top.

8. Menghapus file

```
$ rm [nama_file]
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non commercial use only)". The terminal session starts with:

```
adinrama@adin-rama-ubuntu:~$ ls
aku.txt Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntu:~$ cd praktikum
adinrama@adin-rama-ubuntu:~/praktikum$ ls
sisop
adinrama@adin-rama-ubuntu:~/praktikum$ cd ..
adinrama@adin-rama-ubuntu:~$ mv ~/aku.txt praktikum
mv: cannot stat '/home/aku.txt': No such file or directory
adinrama@adin-rama-ubuntu:~$ mv /home/aku.txt ~/praktikum
mv: cannot stat '/home/aku.txt': No such file or directory
adinrama@adin-rama-ubuntu:~$ mv aku.txt praktikum
adinrama@adin-rama-ubuntu:~$ cd praktikum
adinrama@adin-rama-ubuntu:~/praktikum$ ls
aku.txt sisop
adinrama@adin-rama-ubuntu:~/praktikum$ cd ..
adinrama@adin-rama-ubuntu:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntu:~$ cd praktikum
adinrama@adin-rama-ubuntu:~/praktikum$ ls
aku.txt sisop
adinrama@adin-rama-ubuntu:~/praktikum$ mv aku.txt aku12.txt
adinrama@adin-rama-ubuntu:~/praktikum$ ls
aku12.txt sisop
adinrama@adin-rama-ubuntu:~/praktikum$ rm aku12.txt
adinrama@adin-rama-ubuntu:~/praktikum$ ls
sisop
adinrama@adin-rama-ubuntu:~/praktikum$
```

The terminal window has a dark background with light-colored text. It includes standard Linux navigation commands like ls, cd, and rm. The user's name "adinrama" and session details are visible at the top.

9. Menghapus direktori

```
$ rmdir [nama_file]
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal session starts with:

```
adinrama@adin-rama-ubuntu:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adinrama@adin-rama-ubuntu:~$ rmdir sisop
adinrama@adin-rama-ubuntu:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public temp Templates Videos
adinrama@adin-rama-ubuntu:~$
```

The terminal window has a dark background with light-colored text. It includes standard Linux navigation commands like ls, cd, and rmdir. The user's name "adinrama" and session details are visible at the top.

10. Menghapus direktori yang di dalamnya terdapat file

```
$ rm -rf [nama_direktori]
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal session starts with the user navigating to their home directory (~) and listing files. They then create a new directory named "sisop". After listing the contents again, they navigate into the "sisop" directory and create a file named "hehe.txt" using the nano editor. Finally, they return to the parent directory and use the command "rm -rf sisop" to delete the entire directory structure. The desktop environment visible in the background includes icons for various applications like a browser, file manager, and messaging.

```
adınrama@adin-rama-ubuntu:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public sisop temp Templates Videos
adınrama@adin-rama-ubuntu:~$ mkdir sisop
adınrama@adin-rama-ubuntu:~$ ls
Desktop Documents Downloads Music Pictures praktikum Programming Public temp Templates Videos
adınrama@adin-rama-ubuntu:~$ cd temp
adınrama@adin-rama-ubuntu:~/temp$ ls
sisop
adınrama@adin-rama-ubuntu:~/temp$ cd sisop
adınrama@adin-rama-ubuntu:~/temp/sisop$ ls
adınrama@adin-rama-ubuntu:~/temp/sisop$ nano hehe.txt
adınrama@adin-rama-ubuntu:~/temp/sisop$ ls
hehe.txt
adınrama@adin-rama-ubuntu:~/temp/sisop$ cd ..
adınrama@adin-rama-ubuntu:~/temp$ rm -rf sisop
adınrama@adin-rama-ubuntu:~/temp$ ls
adınrama@adin-rama-ubuntu:~/temp$
```

11. Menampilkan isi sebuah file

```
$ more [nama_file]
```

The screenshot shows a terminal window titled "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The user is in a directory named "Implement" under "Programming". They list the files in the directory, which include "Implements.java", "Main.java", and "Main.class". Then, they use the "more" command to view the contents of the "Main.java" file. The code displayed is a Java class named Main with a main method that creates two threads, each running a lambda expression that prints a thread identifier. The desktop environment visible in the background includes icons for various applications like a browser, file manager, and messaging.

```
adınrama@adin-rama-ubuntu:~/Programming/Implements$ ls
Implements Implements2 MultithreadingJava
adınrama@adin-rama-ubuntu:~/Programming$ cd Implements
adınrama@adin-rama-ubuntu:~/Programming/Implements$ ls
ImplementsJava.class ImplementsJava.java Main.class Main.java
adınrama@adin-rama-ubuntu:~/Programming/Implements$ more Main.java
public class Main {
    public static void main(String[] args){
        ImplementsJava kata1 = new ImplementsJava("thread 1");
        ImplementsJava kata2 = new ImplementsJava("thread 2");

        Thread java1 = new Thread(kata1);
        Thread java2 = new Thread(kata2);

        java1.start();
        java2.start();
    }
}
adınrama@adin-rama-ubuntu:~/Programming/Implements$
```

C. Kepemilikan File dan Hak Akses

- Menggunakan mode alfabet
 1. Untuk mengubah kepemilikan file atau direktori pada user menggunakan perintah chown

```
# chown [nama_pemilik_baru] [nama direktori/namafile]
```

The screenshot shows a terminal window on an Ubuntu 20.04 LTS desktop. The user, 'adinrama', is changing the ownership of a directory named 'Programming' from their own account ('adinrama') to a group account ('adinrama20'). The terminal output is as follows:

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Terminal Activities Mar 20 19:54
adinrama@adin-rama-ubuntuvm:~$ ls -l
total 44
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Desktop
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Documents
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Downloads
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Music
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Pictures
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:21 praktikum
d-----w 5 adinrama adinrama 4096 Mar 18 07:05 Programming
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Public
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:27 temp
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Videos
adinrama@adin-rama-ubuntuvm:~$ sudo chown adinrama20 Programming
adinrama@adin-rama-ubuntuvm:~$ ls -l
total 44
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Desktop
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Documents
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Downloads
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Music
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Pictures
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:21 praktikum
d-----w 5 adinrama20 adinrama 4096 Mar 18 07:05 Programming
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Public
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:27 temp
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Videos
adinrama@adin-rama-ubuntuvm:~$
```

2. Untuk mengubah kepemilikan file atau direktori pada group menggunakan perintah chgrp

```
# chgrp [nama_group_baru] [nama direktori/nama file]
```

The screenshot shows a terminal window on an Ubuntu 20.04 LTS desktop. The user, 'adinrama', is changing the group ownership of a directory named 'Programming' from their own group ('adinrama') to a specific group account ('adinrama21'). The terminal output is as follows:

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Terminal Activities Mar 20 19:58
adinrama@adin-rama-ubuntuvm:~$ ls -l
total 44
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Desktop
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Documents
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Downloads
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Music
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Pictures
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:21 praktikum
d-----w 5 adinrama adinrama 4096 Mar 18 07:05 Programming
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Public
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:27 temp
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Videos
adinrama@adin-rama-ubuntuvm:~$ cd adinrama21
bash: cd: adinrama21: No such file or directory
adinrama@adin-rama-ubuntuvm:~$ chgrp adinrama21 Programming
chgrp: changing group of 'Programming': Operation not permitted
adinrama@adin-rama-ubuntuvm:~$ sudo chgrp adinrama21 Programming
adinrama@adin-rama-ubuntuvm:~$ ls -l
total 44
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Desktop
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Documents
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Downloads
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Music
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Pictures
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:21 praktikum
d-----w 5 adinrama20 adinrama21 4096 Mar 18 07:05 Programming
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Public
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:27 temp
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Videos
adinrama@adin-rama-ubuntuvm:~$
```

3. Menggunakan chmod

chmod [ugoa] [= + -] [rwx] File(s)

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 20:04
adinrama@adin-rama-ubuntuvm:~$ ls
Desktop Pictures praktikum Public temp Templates Videos
adinrama@adin-rama-ubuntuvm:~$ cd praktikum
adinrama@adin-rama-ubuntuvm:~/praktikum$ ls
sisop
adinrama@adin-rama-ubuntuvm:~/praktikum$ sudo chmod g-r sisop
adinrama@adin-rama-ubuntuvm:~/praktikum$ ls
sisop
adinrama@adin-rama-ubuntuvm:~/praktikum$
```

The terminal window shows the user navigating to the 'praktikum' directory and changing group permissions for the 'sisop' file. The file remains in the directory after the command is run.

chmod [ugoa] [= + -] [rwx] Dir(s)

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 20:02
adinrama@adin-rama-ubuntuvm:~$ cd adinrama21
bash: cd: adinrama21: No such file or directory
adinrama@adin-rama-ubuntuvm:~$ chgrp adinrama21 Programming
chgrp: changing group of 'Programming': Operation not permitted
adinrama@adin-rama-ubuntuvm:~$ sudo chgrp adinrama21 Programming
adinrama@adin-rama-ubuntuvm:~$ ls
total 44
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Desktop
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Documents
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Downloads
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Music
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Pictures
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:21 praktikum
d-----w 5 adinrama20 adinrama21 4096 Mar 18 07:05 Public
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:27 temp
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Videos
adinrama@adin-rama-ubuntuvm:~$ sudo chmod u=rw temp
adinrama@adin-rama-ubuntuvm:~$ ls -
total 44
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Desktop
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Documents
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Downloads
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Music
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Pictures
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:21 praktikum
d-----w 5 adinrama20 adinrama21 4096 Mar 18 07:05 Public
drwxrwxr-x 2 adinrama adinrama 4096 Mar 28 19:27 temp
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Templates
drwxr-xr-x 2 adinrama adinrama 4096 Mar 7 21:37 Videos
```

The terminal window shows the user changing group permissions for the 'temp' directory and listing its contents. The directory has been modified to have read and write permissions for the user.

- Menggunakan mode biner

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 20:11
adinrama@adin-rama-ubuntuvm:~$ ls
sisop sisop2
adinrama@adin-rama-ubuntuvm:~$ sudo chmod 111 sisop2
adinrama@adin-rama-ubuntuvm:~$ ls
adinrama@adin-rama-ubuntuvm:~$
```

The terminal window shows the user changing permissions for the 'sisop2' file using octal notation (111), which corresponds to rwxrwxrwx. The file remains in the directory after the command is run.

chmod [Angka_ijin] Dir(s)

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 20:13
adinrama@adin-rama-ubuntuvm:~$ ls
sisop sisop2
adinrama@adin-rama-ubuntuvm:~$ sudo chmod 111 sisop2
adinrama@adin-rama-ubuntuvm:~$ ls
adinrama@adin-rama-ubuntuvm:~$ cd
adinrama@adin-rama-ubuntuvm:~$ ls
Desktop Pictures praktikum Public temp Templates Videos
adinrama@adin-rama-ubuntuvm:~$ sudo chmod 111 temp
adinrama@adin-rama-ubuntuvm:~$ ls
Desktop Pictures praktikum Public temp Templates Videos
adinrama@adin-rama-ubuntuvm:~$
```

The terminal window shows the user changing permissions for the 'temp' directory using octal notation (111), which corresponds to rwxrwxrwx. The directory remains in the current working directory after the command is run.

- Apakah ada cara lain untuk mengganti hak ijin akses file selain menggunakan mode biner dan alfabet?

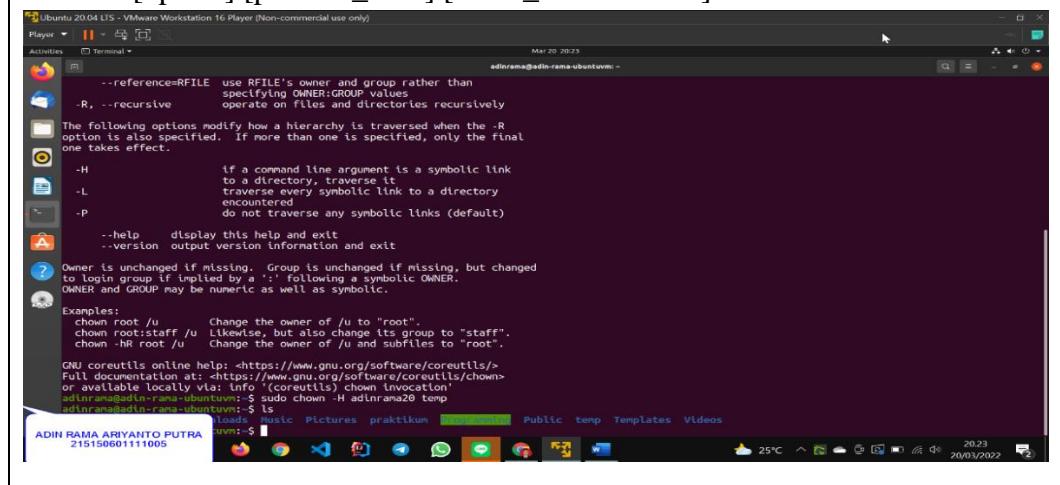
Tidak ada cara lain untuk mengganti hak ijin akses file karena pada sistem operasi linux hanya digunakan dua buah cara untuk mengatasi hal ini yaitu dengan menggunakan mode biner dan alphabet.

- Buatlah file dengan nama coba1 lalu ubahlah hak ijin aksesnya dengan \$ chmod u-x,g+r,o=w coba1. Jelaskan proses perintah tersebut!

Perintah diatas akan mengubah hak akses dari pemilik dikurangi dengan haknya untuk mengeksekusi, group yang telah ditambahkan bisa membaca dan other di set agar bisa menulis.

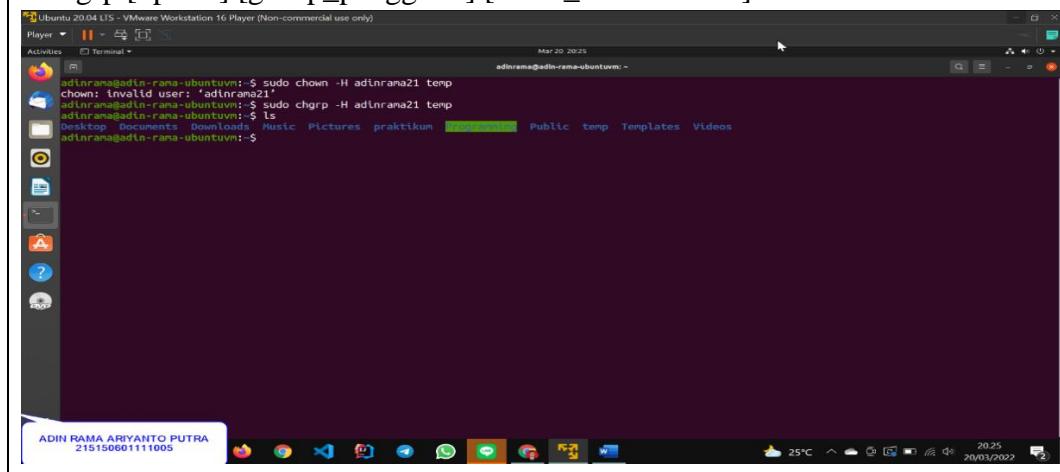
- Pemilik sebuah file atau direktori dapat diganti menjadi user yang lain yang kita inginkan menggunakan perintah chown

```
#chown [option] [pemilik_baru] [nama_file/direktori]
```



- Pemilik sebuah group pada sebuah file dapat diganti dengan menggunakan perintah chgrp

```
# chgrp [option] [group_pengganti] [nama_file/direktori]
```



D. Process dan Thread

- Tipe Proses

1. Interactive : proses yang dimulai dan dikontrol oleh shell.
2. Batch : proses yang tidak berhubungan dengan terminal tetapi menunggu untuk dieksekusi secara berurutan.
3. Daemon : proses yang dimulai ketika proses booting berjalan di background.

- Process Environment

- ~ PATH : daftar lokasi direktori dimana file executable berada
- ~ HOME : lokasi direktori home
- ~ CPPLIBS : lokasi dimana library yang berkaitan dengan program disimpan
- ~ HOSTNAME : digunakan untuk penanaman mesin
- ~ USER : user yang digunakan pada saat login pada sistem operasi

- Memulai menggunakan perintah ps

```
top - 20:32:48 up 1:54, 1 user, load average: 0,01, 0,01, 0,00
Tasks: 281 total, 1 running, 280 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0,7 us, 0,5 sy, 0,0 ni, 98,8 id, 0,0 wa, 0,0 hi, 0,0 si, 0,0 st
Mem: 1941,1 total, 947 free, 1096,2 used, 750,2 buff/cache
Swap: 923,3 total, 922,0 free, 1,3 used, 689,3 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
1471 adinrama 20 0 297692 69196 48444 S 2,0 3,5 0:46.88 Xorg
1647 adinrama 20 0 4052940 343724 101568 S 1,0 17,3 1:17.07 gnome-shell
2027 adinrama 20 0 814020 49952 38056 S 0,7 2,5 0:24.23 gnome-terminal-
3266 adinrama 20 0 12008 3980 3192 R 0,7 0,2 0:00.13 top
727 root 20 0 239528 7432 6264 S 0,3 0,4 0:13.42 vntoolsd
1687 adinrama 20 0 162832 7456 6676 S 0,3 0,4 0:00.31 at-spi2-registr
1804 adinrama 20 0 291428 35812 23888 S 0,3 1,8 0:14.97 vntoolsd
3121 root 20 0 0 0 0 I 0,3 0,0 0:00.57 kworker/0:0-events
3176 root 20 0 0 0 0 I 0,3 0,0 0:08.98 kworker/1:1-mm_percpu_wq
1 root 20 0 101992 11492 8406 S 0,0 0,6 0:03.50 systemd
2 root 20 0 0 0 0 I 0,0 0,0 0:00.03 kthreadd
3 root 0 -20 0 0 0 I 0,0 0,0 0:00.00 rCU_g
4 root 0 -20 0 0 0 I 0,0 0,0 0:00.00 rCU_p
6 root 0 -20 0 0 0 I 0,0 0,0 0:00.00 kworker/0:0H-events_highpri
9 root 0 -20 0 0 0 I 0,0 0,0 0:00.00 mm_percpu_wq
10 root 20 0 0 0 0 S 0,0 0,0 0:00.00 rCU_tasks_rude_
11 root 20 0 0 0 0 S 0,0 0,0 0:00.00 rCU_tasks_trace
12 root 20 0 0 0 0 S 0,0 0,0 0:00.26 ksoftirqd/0
13 root 20 0 0 0 0 I 0,0 0,0 0:02.12 rCU_sched
14 root rt 0 0 0 0 S 0,0 0,0 0:00.00 migration/0
15 root -51 0 0 0 0 S 0,0 0,0 0:00.00 idle_inject/0
16 root 20 0 0 0 0 S 0,0 0,0 0:00.00 cpuhp/0
17 root 20 0 0 0 0 S 0,0 0,0 0:00.00 cpuhp/1
18 root -51 0 0 0 0 S 0,0 0,0 0:00.00 idle_inject/1
19 root rt 0 0 0 0 S 0,0 0,0 0:01.00 migration/1
20 root 20 0 0 0 0 S 0,0 0,0 0:00.27 ksoftirqd/1
```

Apa perintah yang seharusnya ditulis agar menampilkan hasil output seperti di atas?

top

Apa fungsi perintah tersebut?

Untuk memanajemen proses yang terjadi pada Linux tanpa melalui GUI

- Menampilkan semua proses yang sedang berjalan pada sistem

```
adinrama@adin-rama-ubuntuvm:~$ ps -e
PID TTY      TIME CMD
 1 ?        00:00:03 systemd
 2 ?        00:00:00 kthreadd
 3 ?        00:00:00 rcu_gp
 4 ?        00:00:00 rcu_par_gp
 6 ?        00:00:00 kworker/0:0H-events_highpri
 9 ?        00:00:00 mm_percpu_wq
10 ?        00:00:00 rcu_tasks_rude_
11 ?        00:00:00 rcu_tasks_trace
12 ?        00:00:00 ksoftirqd/0
13 ?        00:00:02 rcu_sched
14 ?        00:00:00 migration/0
15 ?        00:00:00 idle_inject/0
16 ?        00:00:00 cpuhp/0
17 ?        00:00:00 cpuhp/1
18 ?        00:00:00 idle_hypact/1
19 ?        00:00:01 migration/1
20 ?        00:00:00 ksoftirqd/1
22 ?        00:00:00 kworker/1:0H-events_highpri
23 ?        00:00:00 kdevtmpfs
24 ?        00:00:00 netns
25 ?        00:00:00 inet_frag_wq
26 ?        00:00:00 kauditfd
28 ?        00:00:00 khungtaskd
29 ?        00:00:00 oom_reaper
30 ?        00:00:00 writeback
31 ?        00:00:00 kcompactd0
32 ?        00:00:00 ksmd
33 ?        00:00:00 khugepaged
88 ?        00:00:00 kIntegrityd
81 ?        00:00:00 kblockd
               :0:00 blkq_punt bio
ADIN RAMA ARYANTO PUTRA
215150601111005
```

Apa perintah yang seharusnya ditulis agar menampilkan hasil output seperti di atas?

`ps -e`

Atau bisa menggunakan perintah :

`Ps -A`

Dan perintah apa yang berfungsi menampilkan semua proses dalam format sesuai definisi user yaitu terdiri dari kolom PID dan CMD ?

`$ ps -eo pid,cmd | more`

- Melihat semua proses yang berjalan kecuali root

`ps -U root -u root -N`

Bagaimana output dari perintah diatas?

```
adinrama@adin-rama-ubuntuvm:~$ ps -U root -u root -N
PID TTY      TIME CMD
 705 ?        00:00:00 systemd-resolve
 706 ?        00:00:00 systemd-timesyn
752 ?        00:00:00 avahi-daemon
756 ?        00:00:02 dbus-daemon
785 ?        00:00:00 rsyslogd
806 ?        00:00:00 avahi-daemon
941 ?        00:00:00 whoopsie
947 ?        00:00:00 kerneloops
944 ?        00:00:00 kerneloops
1098 ?        00:00:00 ktl-daemon
1359 ?        00:00:00 colorl
1420 ?        00:00:01 systemd
1422 ?        00:00:00 (sd-pam)
1427 ?        00:00:02 pulseaudio
1430 ?        00:00:00 tracker-miner-f
1433 ?        00:00:01 dbus-daemon
1434 ?        00:00:00 gnome-keyring-d
1438 ?        00:00:00 gvfsd
1446 ?        00:00:00 gvfsd-fuse
1467 ?        00:00:00 gvfs-udisks2-vo
1468 tty2     00:00:00 gdm-x-session
1477 tty2     00:00:53 Xorg
1487 ?        00:00:00 gvfs-qphoto2-vo
1481 ?        00:00:00 gvfs-afc-volume
1495 ?        00:00:00 goa-identity-se
1500 ?        00:00:00 gvfs-ntp-volume
1505 ?        00:00:00 gvfs-afc-volume
1525 tty2     00:00:00 gnome-session-b
               :0:00 at-spi-bus-Laun
ADIN RAMA ARYANTO PUTRA
215150601111005
```

- Menampilkan proses yang sedang dijalankan oleh user tertentu

```
ps -u <user>
```

Bagaimana output dari perintah diatas?

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 20:55
adinrama@adin-rama-ubuntuvm:~$ ps -u adinrama20
  PID TTY          TIME CMD
ADIN RAMA ARIYANTO PUTRA
215150601111005
ADIN RAMA ARIYANTO PUTRA
215150601111005
```

The terminal shows the following output:

```

| gsd-wacom---2*[{gsd-wacom}]
| gsd-wwan---3*[{gsd-wwan}]
| gsd-xsettings---3*[{gsd-xsettings}]
| gvfs-afc-volume---3*[{gvfs-afc-volume}]
| gvfs-goa-volume---2*[{gvfs-goa-volume}]
| gvfs-ghotphoto2-vo---2*[{gvfs-ghotphoto2-vo}]
| gvfs-ntp-volume---2*[{gvfs-ntp-volume}]
| gvfs-udisks2-vo---3*[{gvfs-udisks2-vo}]
| gvfsd---gvfsd-trash---2*[{gvfsd-trash}]
| |---2*[{gvfsd}]
| gvfsd-fuse---5*[{gvfsd-fuse}]
| gvfsd-metadata---2*[{gvfsd-metadata}]
| ibus-portal---2*[{ibus-portal}]
| ibus-x11---2*[{ibus-x11}]
| pulseaudio---3*[{pulseaudio}]
| tracker-miner-f---4*[{tracker-miner-f}]
| vntoolsd---3*[{vntoolsd}]
| xdg-permission---2*[{xdg-permission-}]
```
systemd-journal
systemd-logind
systemd-resolve
systemd-timesyn---(systemd-timesyn)
systemd-udevd
udisksd---4*[{udisksd}]
unattended-upgr---(unattended-upgr)
upowerd---2*[{upowerd}]
vntoolsd---3*[{vntoolsd}]
vmware-vmblock---2*[{vmware-vmblock-}]
whoopsie---2*[{whoopsie}]
wpa_supplicant
```
adinrama@adin-rama-ubuntuvm:~$ ps -u adinrama20
  PID TTY          TIME CMD
ADIN RAMA ARIYANTO PUTRA
215150601111005
ADIN RAMA ARIYANTO PUTRA
215150601111005
```

- Menampilkan proses yang sedang berjalan dalam bentuk pohon

```
pstree
```

Bagaimana output dari perintah diatas?

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 20 20:52
adinrama@adin-rama-ubuntuvm:~$ pstree
  PID TTY          TIME CMD
ADIN RAMA ARIYANTO PUTRA
215150601111005
ADIN RAMA ARIYANTO PUTRA
215150601111005
```

The terminal shows the following output:

```

systemd---ModemManager---2*[{ModemManager}]
| NetworkManager---2*[{NetworkManager}]
| | VGAAuthService
| accounts-daemon---2*[{accounts-daemon}]
| acpid
| avahi-daemon---avahi-daemon
| colord---2*[{colord}]
| cron
| cups-browsed---2*[{cups-browsed}]
| cupsd
| dbus-daemon
| fwupd---4*[{fwupd}]
| gdm3---gdm-session-wor---gdm-x-session---Xorg---(Xorg)
| | | |---ssh-agent
| | | |---gnome-session-b---2*[{gnome-session-b}]
| | | |---2*[{gdm-x-session}]
| | | |---2*[{gdm-session-wor}]
| | | |---2*[{gdm3}]
| | gnome-keyring-d---3*[{gnome-keyring-d}]
| | irqbalance---(irqbalance)
| | 2*[{kernelLoops}]
| | networkd-dispat
| | polkitd---2*[{polkitd}]
| | rsyslog---3*[{rsyslogd}]
| | rtkit-daemon---2*[{rtkit-daemon}]
| | snapd---10*[{snapd}]
| | switcheroo-cont---2*[{switcheroo-cont}]
| | systemd---at-spl-bus-laun---dbus-daemon
| | | |---3*[{at-spl-bus-laun}]
```
adinrama 3271 0.0 0.2 10624 4844 pts/1 Ss 20:34 0:00 bash
adinrama 3338 0.0 0.1 11500 3268 pts/1 R+ 20:51 0:00 ps -u
```
ADIN RAMA ARIYANTO PUTRA
215150601111005
ADIN RAMA ARIYANTO PUTRA
215150601111005
```

Apa perbedaan perintah pstree dengan ps -h?

```
$ pstree -h
```

Perintah diatas digunakan untuk menampilkan proses dan ancestor yang tercetak tebal menggunakan opsi -h.

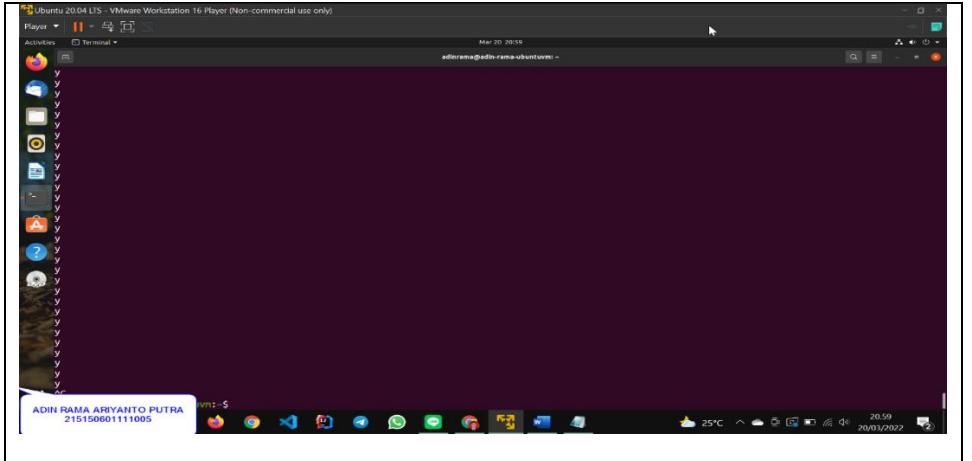
```
$pstree
```

Perintah diatas fungsinya sama dengan perintah ps, tetapi ditampilkan dalam bentuk pohon.

- Controlling process

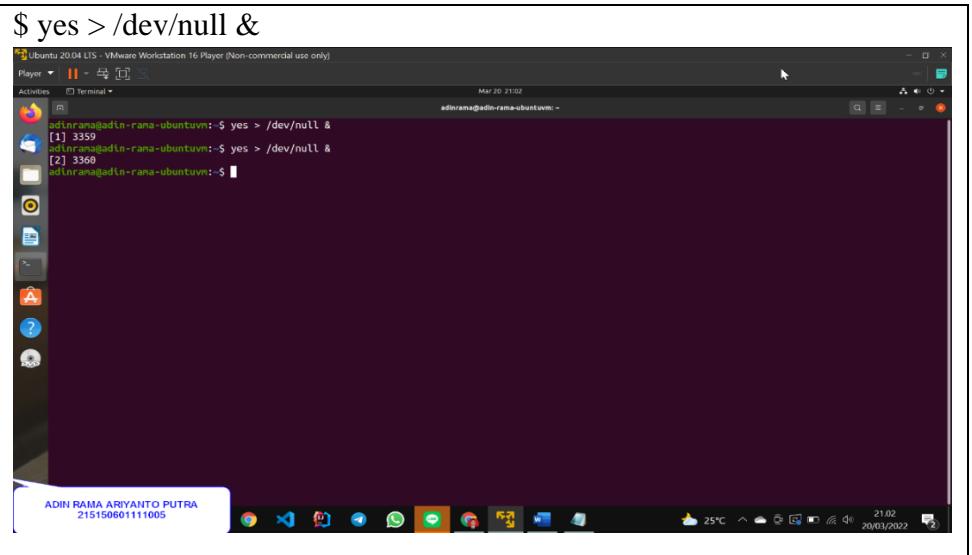
```
$ yes
```

1. Bagaimana cara untuk menghentikan perintah \$yes di atas? Bagaimana outputnya?



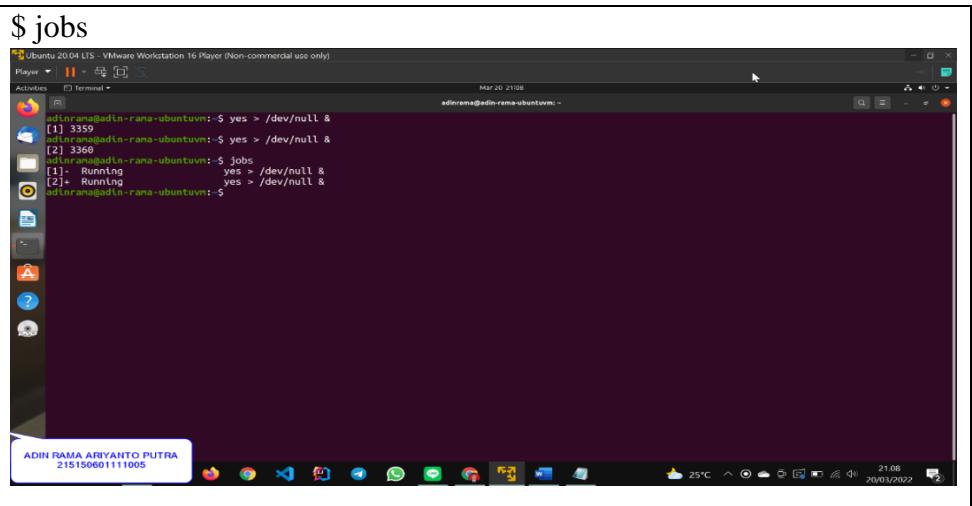
A screenshot of a Linux desktop environment, specifically Ubuntu 20.04 LTS, running in a VMware Workstation Player window. The desktop has a dark theme with a dock at the bottom containing various application icons. A terminal window is open in the top right corner, showing the command '\$ yes' being typed. The terminal's title bar says 'Activities Terminal'. The status bar at the bottom of the terminal shows the date and time as 'Mar 20 20:59'.

2. Bagaimana cara agar perintah \$yes tetap dijalankan tetapi shell tetap digunakan untuk hal yang lain? Bagaimana outputnya?



A screenshot of a Linux desktop environment, specifically Ubuntu 20.04 LTS, running in a VMware Workstation Player window. The desktop has a dark theme with a dock at the bottom containing various application icons. A terminal window is open in the top right corner, showing the command '\$ yes > /dev/null &' being typed. The terminal's title bar says 'Activities Terminal'. The status bar at the bottom of the terminal shows the date and time as 'Mar 20 21:02'.

3. Bagaimana cara untuk melihat status proses yang sedang berjalan? Bagaimana outputnya?



A screenshot of a Linux desktop environment, specifically Ubuntu 20.04 LTS, running in a VMware Workstation Player window. The desktop has a dark theme with a dock at the bottom containing various application icons. A terminal window is open in the top right corner, showing the command '\$ jobs' being typed. The terminal's title bar says 'Activities Terminal'. The status bar at the bottom of the terminal shows the date and time as 'Mar 20 21:08'.

- Perintah Kill

1. Bagaimana contoh perintah kill?

```
$ kill <sinyal> <pid>
```

2. ps aux | grep <myusername>

Bagaimana output dari perintah diatas?

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal
adinrama@adin-rama-ubuntuvm:~ Mar 20 21:12
adinrama 1742 0.0 1.3 2525040 26796 ? S1 18:38 0:00 /usr/bin/gjs /usr/share/gnome-shell/org.gnome.Shell.Notifications
adinrama 1756 0.0 0.5 317548 19776 ? S1 18:38 0:00 /usr/libexec/gvfsd-trash --spawner :1.2 /org/gtk/gvfs/exec_spaw/0
adinrama 1756 0.0 0.4 313994 29068 ? S1 18:38 0:00 /usr/libexec/gsd-alloy-settings
adinrama 1756 0.0 1.4 313994 29068 ? S1 18:38 0:00 /usr/libexec/gsd-cdrom
adinrama 1767 0.0 0.8 374368 17264 ? S1 18:38 0:00 /usr/libexec/gsd-controlplane
adinrama 1770 0.0 0.4 314160 29452 ? S1 18:38 0:00 /usr/libexec/gsd-housekeeping
adinrama 1772 0.0 1.4 346988 28212 ? S1 18:38 0:00 /usr/libexec/gsd-keyboard
adinrama 1780 0.0 1.5 982200 30452 ? S1 18:38 0:00 /usr/libexec/gsd-media-keys
adinrama 1782 0.0 1.4 347416 29416 ? S1 18:38 0:00 /usr/libexec/gsd-power
adinrama 1784 0.0 0.5 248224 11116 ? S1 18:38 0:00 /usr/libexec/gsd-print-notifications
adinrama 1788 0.0 0.3 457104 6094 ? S1 18:38 0:00 /usr/libexec/gsd-rfkill
adinrama 1789 0.0 0.3 235512 5972 ? S1 18:38 0:00 /usr/libexec/gsd-screensaver-proxy
adinrama 1799 0.0 0.5 468908 11752 ? S1 18:38 0:00 /usr/libexec/gsd-sharing
adinrama 1803 0.0 2.9 638292 59008 ? S1 18:38 0:00 /usr/libexec/evolution-data-server/evolution-alarm-notify
adinrama 1804 0.2 1.7 291428 35012 ? S1 18:38 0:28 /usr/bin/vmtoolsd -n vmsur --blockFd 3
adinrama 1805 0.0 0.5 318084 10408 ? S1 18:38 0:00 /usr/libexec/gsd-smartcard
adinrama 1813 0.0 0.5 321784 11616 ? S1 18:38 0:00 /usr/libexec/gsd-sound
adinrama 1815 0.0 0.4 387888 9304 ? S1 18:38 0:00 /usr/libexec/gsd-usb-protection
adinrama 1817 0.0 1.0 346544 27912 ? S1 18:38 0:00 /usr/libexec/gsd-wacom
adinrama 1822 0.0 0.5 346544 18712 ? S1 18:38 0:00 /usr/libexec/gsd-wireless
adinrama 1823 0.0 1.4 347672 29288 ? S1 18:38 0:00 /usr/libexec/gsd-settings
adinrama 1827 0.0 0.2 231800 5516 ? S1 18:38 0:00 /usr/libexec/gsd-disk-utility-notify
adinrama 1852 0.0 0.7 342192 14776 ? S1 18:38 0:00 /usr/libexec/gsd-printer
adinrama 1884 0.0 0.4 166552 9168 ? S1 18:39 0:00 /usr/libexec/ibus-engine-simple
adinrama 1972 0.0 0.3 162256 6236 ? S1 18:39 0:00 /usr/libexec/gvfsd-metadata
adinrama 1975 0.0 1.6 420212 32176 ? S1 18:39 0:00 update-notifier
adinrama 2027 0.3 2.6 819192 52548 ? S1 18:40 0:32 /usr/libexec/gnome-terminal-server
adinrama 3271 0.0 0.2 10624 4844 pts/1 S+ 20:34 0:00 bash
adinrama 3359 99.5 0.0 8088 584 pts/1 R 21:01 9:51 yes
adinrama 3366 99.5 0.0 8088 576 pts/1 R 21:02 9:33 yes
adinrama 3373 0.0 0.1 11500 3276 pts/1 R+ 21:11 0:00 ps aux
adinrama 3374 0.0 0.0 9648 648 pts/1 S+ 21:11 0:00 grep --color=auto adinrama
ADIN RAMA ARIYANTO PUTRA
215150601111005
21.12
20/03/2022
```

- Daemons

Apa yang membedakan Daemons dengan proses yang lain?

Daemon tidak memiliki parentproses ID, daemon tidak memiliki pengontrol baik itu STDOUT, STDIN, maupun STDERR, daemon berjalan dalam privilege super user.

2.3.2 Pengenalan Lingkungan Sistem Operasi Linux Shell

- Bagaimana cara menampilkan shell yang tersedia di linux Anda? Tunjukkan screenshot!

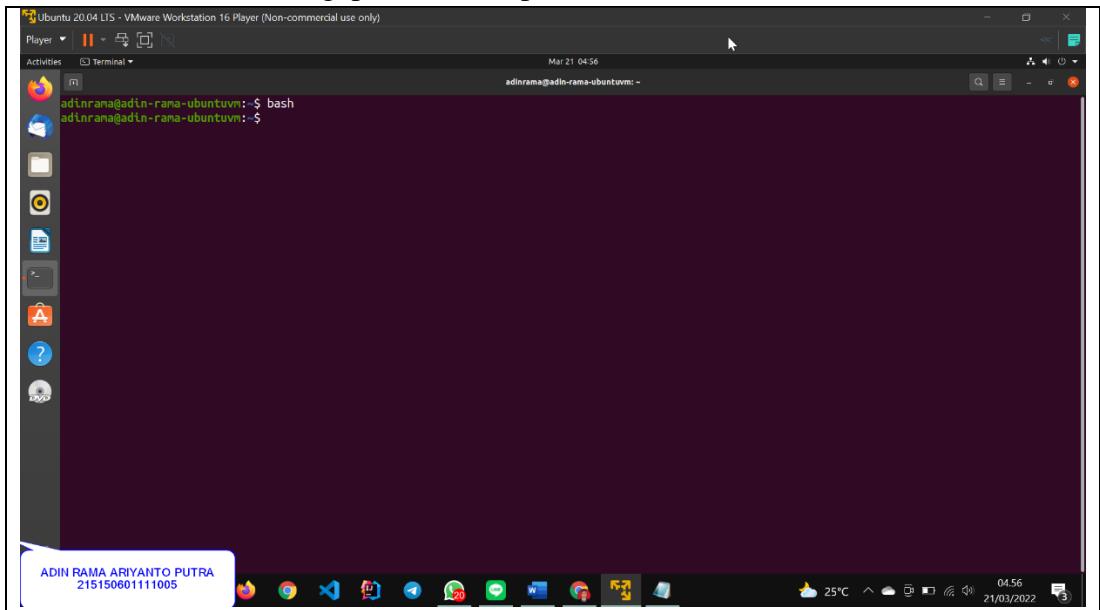
Dengan menggunakan perintah : \$ ps -p \$\$

```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal
adinrama@adin-rama-ubuntuvm:~ Mar 21 04:53
PID TTY TIME CMD
1996 pts/0 00:00:00 bash
adinrama@adin-rama-ubuntuvm:~
```

1. Macam-macam shell

Shell	Developer	Lokasi	Keterangan
Bourne Shell (/bin/sh)	Steven Bourne		Shell yang pertama kali ada di Linux
Bourne again shell (/bin/bash)	Brian Fox dan Chet Ramey	Free Software Foundation	Shell yang paling umum digunakan di semua sistem operasi Linux
C Shell (/bin/csh)	Bill Joy	Universitas Berkeley California	Shell yang mengadopsi perintah pemrograman C
Tenee C Shell (/bin/tesh)			Shell yang merupakan pengembangan dari UNIX C Shell
Korn Shell (/bin/ksh)	Bill Joy	AT & T Labs	Shell ini menggabungkan kelebihan Bourne Shell dan C Shell sehingga lebih interaktif
Alquimist Shell (/bin/ash)	Kenneth Almquist		ASH banyak digunakan dalam embedded Linux, sistem yang tertanam misalnya BIOS
Z Shell (/bin/zsh)			Z Shell digunakan oleh pengguna Linux untuk membangun script yang kompleks

Ketikkan perintah “bash” pada terminal Anda, apa yang akan muncul? Mengapa muncul seperti itu?



```
Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player | II | X
Activities Terminal Mar 21 04:56
adinrama@adin-rama-ubuntuvm:~$ bash
adinrama@adin-rama-ubuntuvm:~$
```

Karena perintah hanya digunakan untuk mengubah sistem shell yang sebelumnya aktif ke dalam sistem shell bash

- Mengganti shell

Contoh mengganti shell dengan utilitas chsh (change shell) :

```
$ chsh
Password :
Changing the login shell for praktikum
Enter the new value, or press ENTER for the default
Login Shell [/bin/bash] : /bin/sh
```

- Menjalankan shell

```
bash@praktikum:~$ sh
$
$ exit
```

- Menjalankan script shell

- Langsung running dari file .sh

```
$ bash hello.sh
```

- Mengubah hak aksesnya

```
$ chmod +rwx hello.sh
```

- Melihat variabel PATH

```
$ echo $PATH
```

- Menentukan variabel PATH

```
$  
PATH=$PATH:folder_baru_yang_mengandung_bina  
ry
```

2.3.3 Macam – Macam Struktur Sistem Operasi

A. Struktur Sederhana

Merupakan sistem operasi dengan struktur yang sederhana, karena dibuat sedemikian rupa sehingga memiliki fungsionalitas yang maksimum dengan ukuran yang sekecil mungkin. Lebih jauh lagi, MS DOS tidak dibagi ke dalam modul-modul (modular) serta antarmuka dan tingkat fungsionalitasnya juga tidak dipisahkan dengan baik.

B. Struktur Lapisan

Sistem operasi dibagi ke dalam beberapa lapis, dimana setiap lapis dibangun diatas lapisan sebelumnya. Lapisan 0 adalah perangkat keras yang merupakan lapisan paling dasar, sedangkan lapisan paling tinggi (atau terluar) merupakan antarmuka pemakai. Dengan modularitas, lapisan-lapisan tersebut dipilih sedemikian rupa sehingga setiap lapisan hanya menggunakan fungsifungsi (atau operasi-operasi) dan layanan-layanan dari lapisan yang ada tepat di bawahnya.

C. Struktur Monolitik

Sistem monolitik Merupakan struktur sistem operasi sederhana yang dilengkapi dengan operasi “dual” pelayanan {sistem call} yang diberikan oleh sistem operasi. Model sistem call dilakukan dengan cara mengambil sejumlah parameter pada tempat yang telah ditentukan sebelumnya, seperti register atau stack dan kemudian mengeksekusi suatu intruksi trap tertentu pada monitor mode.

D. Struktur Mikrokernel

Konsep mikrokernel sangatlah sederhana, yaitu memindahkan sebanyak mungkin fungsi-fungsi yang ada dalam kernel ke ruang atau lapisan pemakai sehingga ukuran kernel menjadi sekecil mungkin. Untuk komunikasi antara modul pemakai menggunakan pengiriman pesan.

E. Struktur Modular

Setiap modul mempunyai komponen utama (core component) yang terpisah satu sama lain dan berkomunikasi melalui antarmuka-antarmuka yang telah dikenal satu sama lain. Setiap modul dapat diangkat dan dijalankan dalam kernel sesuai dengan keperluan. Secara umum, pendekatan modular mirip dengan pendekatan berlapis tetapi lebih fleksibel.

Buat file hello.c

Buat file bernama Makefile, harus satu direktori dengan hello.c

Compile source code dengan perintah :

\$ make

Setelah di compile akan muncul file baru, yaitu hello.ko

Pasang kernel modul dengan perintah :

\$ sudo insmod hello.ko

Cek apakah kernel module telah dipasang dengan perintah lsmod

Cek output dari kernel module dengan perintah dmesg

Lepas kernel module dengan perintah :

\$ sudo rmmod hello

Cek output dari kernel module setelah dilepas dengan perintah dmesg



**LABORATORIUM PEMBELAJARAN ILMU
KOMPUTER FAKULTAS ILMU KOMPUTER
UNIVERSITAS BRAWIJAYA**

NAMA : ADIN RAMA ARIYANTO PUTRA
NIM : 215150601111005
TUGAS : BAB II
TANGGAL : 08/03/2022
ASISTEN : RICKO ANGGORO PUTRA YUSTONO

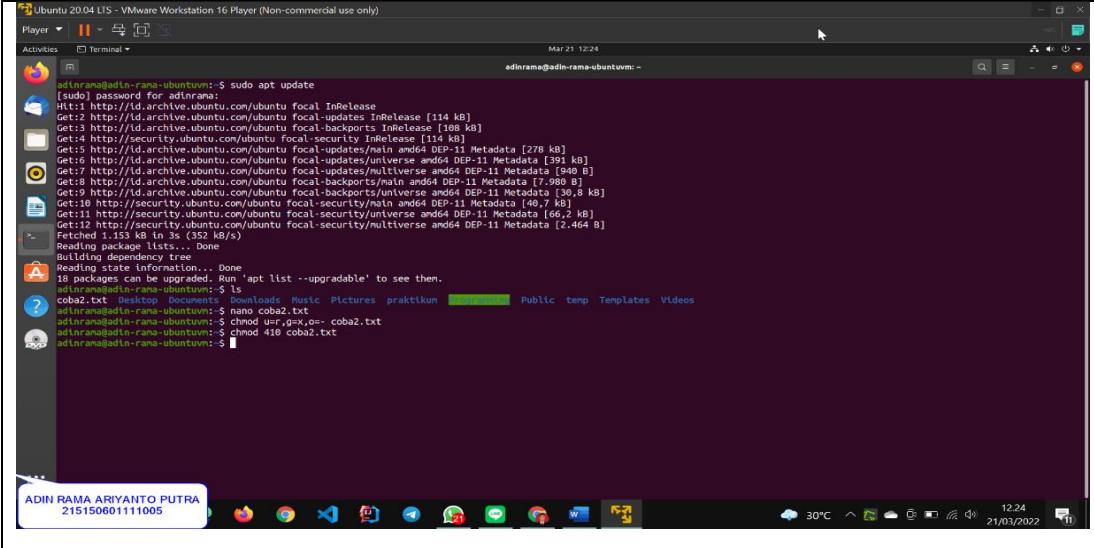
2.4 Tugas

1. Carilah fungsi directory berikut :

Direktori	Deskripsi
/	merupakan induk dari susunan direktori di linux dan merupakan tempat dimana semua direktori berada
/bin	directory ini berisi program perintah esensial yang dibutuhkan oleh semua user. program-program disini dapat dijalankan, meskipun tidak ada sistem file lain yang di mount. directory ini tidak memiliki subdirectory
/dev	merupakan direktori yang berfungsi untuk menyimpan konfigurasi device atau hardware dari sistem, seperti harddisk (hda, sda), terminal (tty) etc
/etc	merupakan direktori yang berfungsi untuk menyimpan skrip installation pada /etc/rc.d sub direktori dan file-file konfigurasi dari sistem, misalkan konfigurasi service, penjadwalan etc
/home	direktori tempat user menaruh file
/lib	merupakan direktori yang berfungsi untuk menyimpan library dasar dari system termasuk modul driver yang dapat diisi pada sistem boot
/proc	merupakan direktori yang berfungsi untuk menyimpan informasi proses

	sistem dan kernel dari sistem operasi, mencakupi informasi mengenai berbagai aspek sistem Linux
/root	struktur paling dasar yang harus bisa melakukan boot, perbaikan atau mengembalikan sistem seperti dalam keadaan semula
/sbin	merupakan direktori yang berfungsi untuk menyimpan aplikasi dasar dari linux yang dijalankan oleh super user (root) misalnya mount, shutdown, umount
/tmp	berisi file-file sementara yang dibutuhkan sebuah aplikasi yang sedang berjalan
/usr	merupakan direktori untuk menyimpan aplikasi yang diinstall oleh user, misalkan OpenOffice, Kate , chrome dan sebagainya
/var	merupakan direktori untuk menyimpan informasi pencatatan log sistem, web server, mailbox dan data-data aplikasi

2. Buatlah file dengan nama coba2.txt lalu ubahlah izin aksesnya dengan menggunakan mode biner & alfabet, dimana owner ijin hanya read, group hanya execute, dan other tidak ada akses sama sekali!



```

Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)
Player Activities Terminal Mar 21 12:24
adinrama@adin-rama-ubuntuvm:~$ sudo apt update
[sudo] password for adinrama:
Get:1 http://ld.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://ld.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://ld.archive.ubuntu.com/ubuntu focal-backports InRelease [100 kB]
Get:4 http://security.ubuntu.com/ubuntu Focal-Security InRelease [114 kB]
Get:5 http://ld.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Metadata [278 kB]
Get:6 http://ld.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata [391 kB]
Get:7 http://ld.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 DEP-11 Metadata [960 B]
Get:8 http://ld.archive.ubuntu.com/ubuntu focal-updates/main i386 DEP-11 Metadata [30,8 kB]
Get:9 http://ld.archive.ubuntu.com/ubuntu focal-updates/universe i386 DEP-11 Metadata [30,8 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metadata [40,7 kB]
Get:11 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [66,2 kB]
Get:12 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11 Metadata [2,464 kB]
Fetched 1.153 kB in 3s (352 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
18 packages can be upgraded. Run 'apt list --upgradable' to see them.
adinrama@adin-rama-ubuntuvm:~$ ls
coba2.txt  Desktop  Documents  Downloads  Music  Pictures  praktikum  Public  temp  Templates  Videos
adinrama@adin-rama-ubuntuvm:~$ nano coba2.txt
adinrama@adin-rama-ubuntuvm:~$ chmod +rx,o-- coba2.txt
adinrama@adin-rama-ubuntuvm:~$ chmod 410 coba2.txt
adinrama@adin-rama-ubuntuvm:~$ 

```

3. Saya mempunyai script yang berada di /home/sisop/script. Saya ingin mengeksekusi script tanpa menjalankan sh bash. Bagaimana caranya?

Dengan menggunakan perintah path=\$path : /home/sisop/script

```
root@adin-rama-ubuntu:~/home/adinrama# cd sisop
root@adin-rama-ubuntu:~/home/adinrama/sisop# touch script
root@adin-rama-ubuntu:~/home/adinrama/sisop# ls -l
total 0
-rw-r--r-- 1 root root 0 Mar 21 20:10 script
root@adin-rama-ubuntu:~/home/adinrama/sisop# path=$path : /home/sisop/script
root@adin-rama-ubuntu:~/home/adinrama/sisop#
```

- Buatlah dua group dengan nama parent dan children dan buat user baru untuk masing-masing groups lalu susun groups dan user tersebut sehingga pengelompokannya menjadi seperti ini :

Parent	Children
Joni	Ana
Budi	Ani

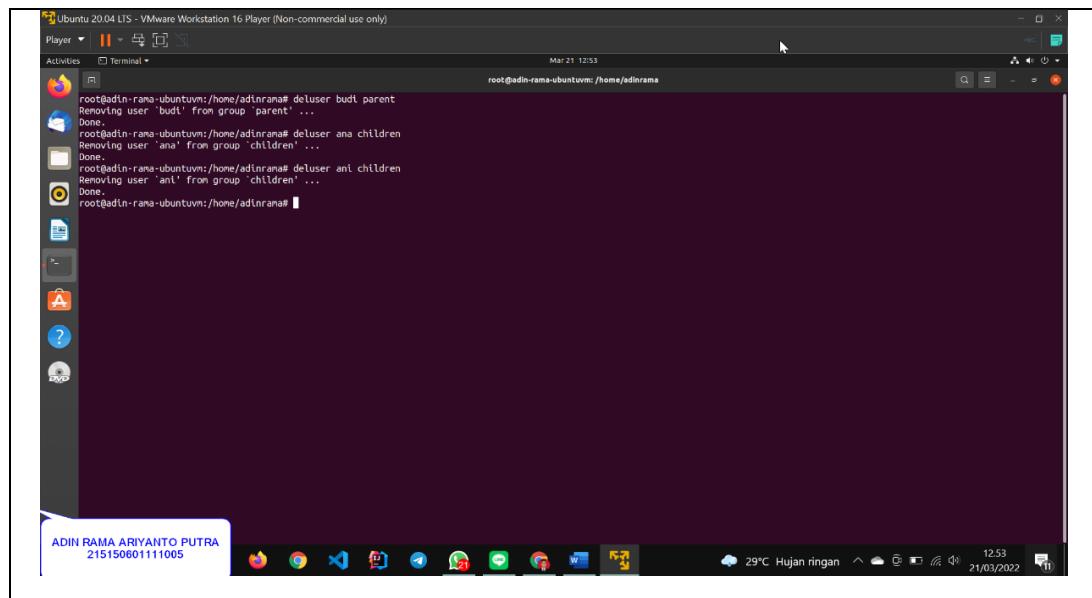
Jawab :

```
root@adin-rama-ubuntu:~# sudo su
[sudo] password for adinrama:
root@adin-rama-ubuntu:~# adduser budi
Adding user `budi' ...
Adding new group `budi' (1086)
Adding user `budi' to group `budi'
Creating home directory `/home/budi' ...
Copying files from `/etc/skel' ...
root@adin-rama-ubuntu:~# adduser anil
Adding user `anil' ...
Adding new group `anil' (1087)
Adding user `anil' to group `anil'
Creating home directory `/home/anil' ...
Copying files from `/etc/skel' ...
root@adin-rama-ubuntu:~# passwd ana
New password:
Re-type new password:
passwd: password updated successfully
Changing the user information for ana
Enter the new value, or press ENTER for the default
Full Name []:
Real Name []:
Mail []:
Home Phone []:
Other []:
Is the information correct? [Y/n] y
root@adin-rama-ubuntu:~# adduser ant
Adding new user `ant' (1088) ...
Adding new group `ant' (1088) with group `anil' ...
Creating home directory `/home/ant' ...
Copying files from `/etc/skel' ...
root@adin-rama-ubuntu:~# passwd ant
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for ant
Enter the new value, or press ENTER for the default
Full Name []:
Real Name []:
Mail []:
Work Phone []:
Home Phone []:
Other []:
Is the information correct? [Y/n] y
root@adin-rama-ubuntu:~# adduser ant children
Adding user `ant' to group `children' ...
root@adin-rama-ubuntu:~# adduser ant parent
Adding user `ant' to group `parent' ...
root@adin-rama-ubuntu:~# adduser ana children
Adding user `ana' to group `children' ...
root@adin-rama-ubuntu:~# adduser ani parent
Adding user `ani' to group `parent' ...
root@adin-rama-ubuntu:~#
```



```
root@adin-rama-ubuntu:~# getent group parent
parent:x:1003:joni,budi
root@adin-rama-ubuntu:~# getent group children
children:x:1004:ana,ani
root@adin-rama-ubuntu:~#
```

5. Hapuslah user yang telah dibuat (min 2) beserta home directory-nya!

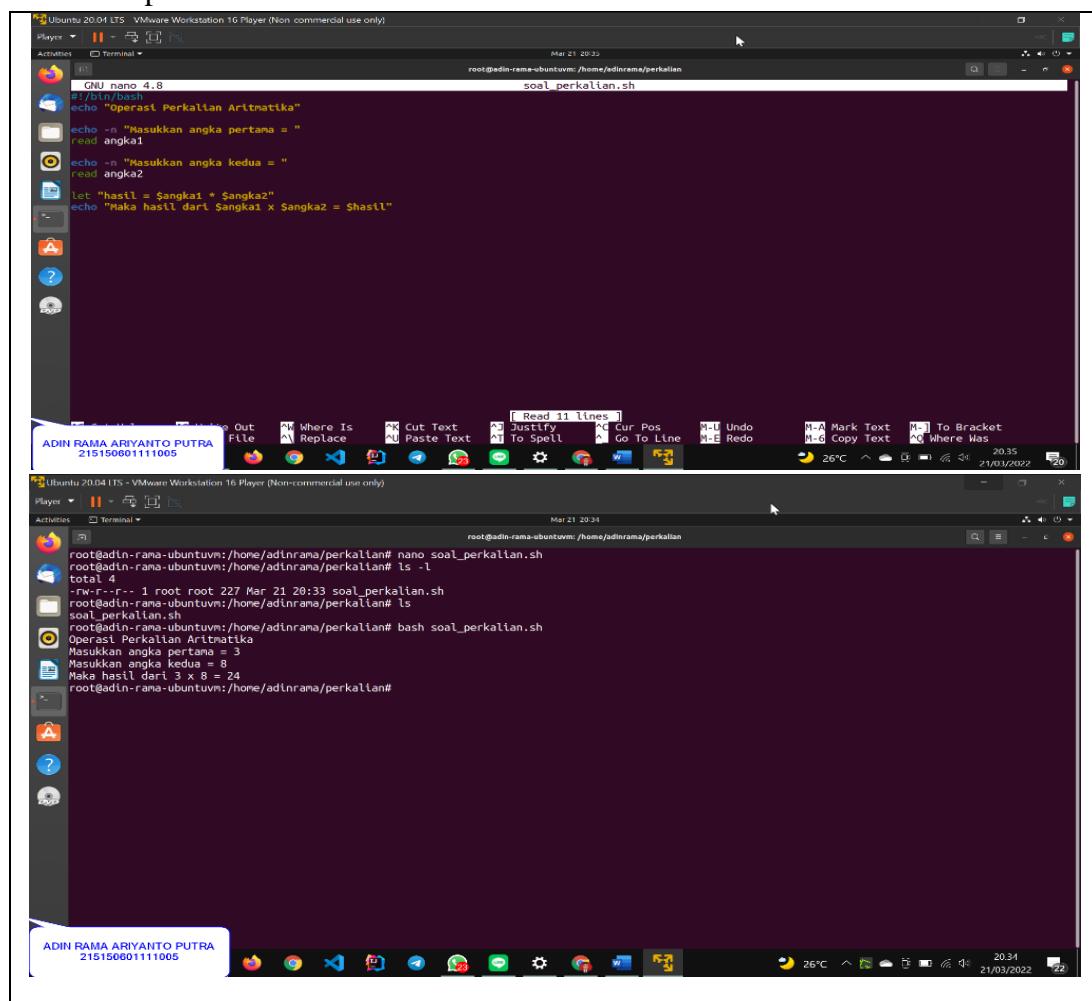


The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "Ubuntu 20.04 LTS - VMware Workstation 16 Player (Non-commercial use only)". The terminal content shows the root user executing commands to remove users 'budi' and 'ana' from their respective groups and then deleting them:

```
root@adin-rama-ubuntu:~# deluser budi parent
Removing user 'budi' from group 'parent' ...
Done.
root@adin-rama-ubuntu:~# deluser ana children
Removing user 'ana' from group 'children' ...
Done.
root@adin-rama-ubuntu:~# deluser anil children
Removing user 'anil' from group 'children' ...
Done.
root@adin-rama-ubuntu:~# deluser -r adinrama
Removing user 'adinrama' ...
Done.
```

The desktop interface includes a dock with various application icons and a system tray at the bottom right showing weather and date information.

6. Buat perintah untuk menghitung perkalian aritmatika dengan menggunakan variabel inputan!



The screenshot shows a Linux desktop environment with two terminal windows open. The top terminal window shows the creation of a shell script named 'soal_perkalian.sh' using the nano editor:

```
GNU nano 4.8
#!/bin/bash
echo "Operasi Perkalian Aritmatika"
echo -n "Masukkan angka pertama = "
read angka1
echo -n "Masukkan angka kedua = "
read angka2
let "hasil = $angka1 * $angka2"
echo "Maka hasil dari $angka1 x $angka2 = $hasil"
```

The bottom terminal window shows the root user executing the script and interacting with it:

```
root@adin-rama-ubuntu:~/home/adinrama/perkalian# nano soal_perkalian.sh
root@adin-rama-ubuntu:~/home/adinrama/perkalian# ls -l
total 4
-rw-r--r-- 1 root root 227 Mar 21 20:33 soal_perkalian.sh
root@adin-rama-ubuntu:~/home/adinrama/perkalian# bash soal_perkalian.sh
Operasi Perkalian Aritmatika
Masukkan angka pertama 3
Masukkan angka kedua 8
Maka hasil dari 3 x 8 = 24
root@adin-rama-ubuntu:~/home/adinrama/perkalian#
```

The desktop interface includes a dock with various application icons and a system tray at the bottom right showing weather and date information.

7. Coba buatlah sebuah modul kemudian install dan kemudian remove!



**LABORATORIUM PEMBELAJARAN ILMU
KOMPUTER FAKULTAS ILMU KOMPUTER
UNIVERSITAS BRAWIJAYA**

NAMA : ADIN RAMA ARIYANTO PUTRA
NIM : 215150601111005
KESIMPULAN: BAB II
TANGGAL : 08/03/2022
ASISTEN : RICKO ANGGORO PUTRA YUSTONO

2.5 Kesimpulan

1. Jelaskan pengertian dari CLI beserta kelebihan dan kekurangannya!

Tipe antarmuka dimana pengguna berinteraksi dengan sistem operasi melalui text-terminal.

Kelebihan CLI :

1. Mudah dalam membuat folder dan sub folder
2. Efisiensi, ringan dan cepat
3. Performa stabil
4. Hanya memerlukan spesifikasi hardware yang rendah
5. Jarang terkena virus

Kekurangan CLI :

1. Harus menghafal/mengerti berbagai kode baris dan perintah
2. Bagi pengguna awam, terkesan tidak menarik dan sangat membosankan
3. Salah perintah yang diinputkan bisa mengakibatkan fatal
4. Risiko kehilangan file lebih besar

2. Sebutkan dan jelaskan 5 jenis perintah ls beserta fungsinya!

ls -lah	Merupakan options -a, -l, -h yang berfungsi untuk menampilkan daftar seluruh dari direktori dengan format file berupa ukuran file, atribut file, dan juga tanggal awal file tersebut tersimpan kedalam direktori.
ls -l	Menampilkan hasil dalam satu format panjang kebawah.
ls -a	Menampilkan semua file, termasuk file yang diawali dengan titik (.), jika dalam normalnya perintah ls tidak menampilkannya (misalnya, file yang tersembunyi).

ls -r	Menampilkan dalam urutan terbalik (reverse) dari normalnya ls menampilkan urutan abjad a-z.
ls -h	Menampilkan format ukuran file yang dapat dibaca dengan mudah daripada byte.

3. Jelaskan kegunaan shell dan tunjukkan shell apa saja yang ada pada Linux!

Shell	Developer	Lokasi	Keterangan
Bourne Shell (/bin/sh)	Steven Bourne		Shell yang pertama kali ada di Linux
Bourne again shell (/bin/bash)	Brian Fox dan Chet Ramey	Free Software Foundation	Shell yang paling umum digunakan di semua sistem operasi Linux
C Shell (/bin/csh)	Bill Joy	Universitas Berkeley California	Shell yang mengadopsi perintah pemrograman C
Tenee C Shell (/bin/tesh)			Shell yang merupakan pengembangan dari UNIX C Shell
Korn Shell (/bin/ksh)	Bill Joy	AT & T Labs	Shell ini menggabungkan kelebihan Bourne Shell dan C Shell sehingga lebih interaktif
Alquimist Shell (/bin/ash)	Kenneth Almquist		ASH banyak digunakan dalam embedded Linux, sistem yang tertanam misalnya BIOS
Z Shell (/bin/zsh)			Z Shell digunakan oleh

			pengguna Linux untuk membangun script yang kompleks.
--	--	--	--

4. Jelaskan fungsi dari hak akses!

Hak akses merupakan akses yang dapat dilakukan oleh user untuk membaca, menulis, dan mengeksekusi file.

Jenis-jenis hak akses :

1. Read artinya mengizinkan user lain untuk membaca isi dari file tersebut tetapi user lain tidak dapat melakukan perubahan isi file.
2. Write artinya mengizinkan kepada user lain untuk dapat membaca dan melakukan perubahan terhadap isi file, termasuk menghapusnya.
3. Execute artinya mengizinkan user lain dapat mengeksekusi/menjalankan file (biasanya berupa script atau program).