

## Rekap Laporan Praktikum SO

### Praktikum 1

Nama : Muhammad Khoiruddin

NIM : L200170104

Kelas : E

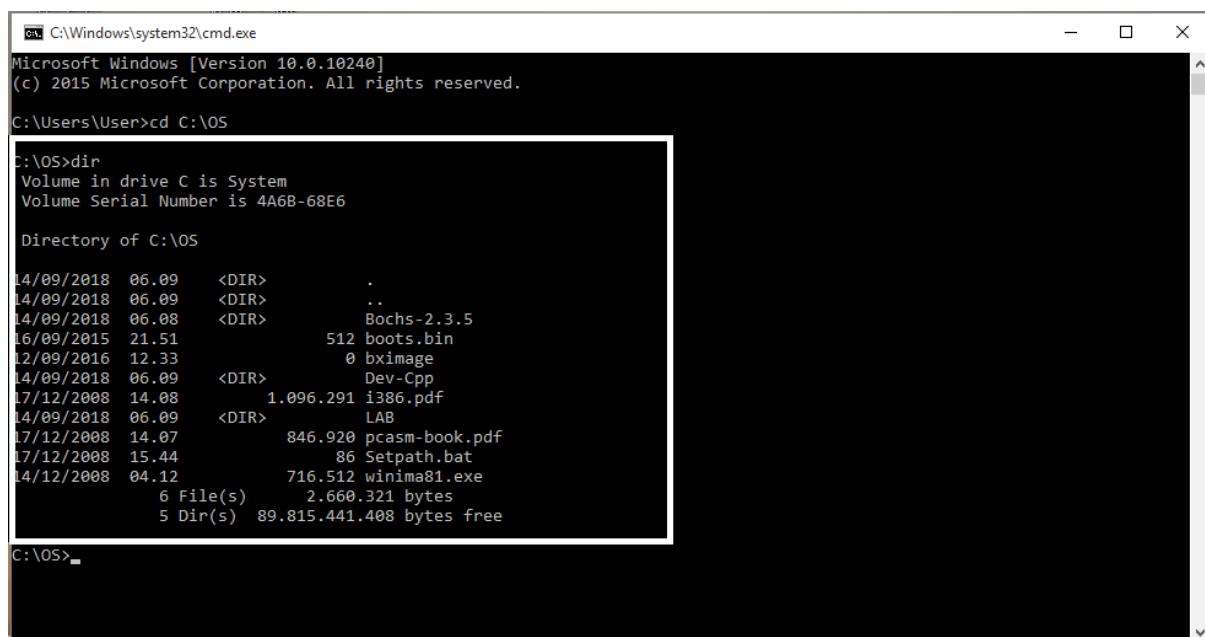
#### 1. Memanggil direktori OS



```
cmd Select C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:\OS
```

#### 2. Melihat isi direktori



```
cmd C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:\OS

C:\OS>dir
 Volume in drive C is System
 Volume Serial Number is 4A6B-68E6

 Directory of C:\OS

14/09/2018  06.09    <DIR>      .
14/09/2018  06.09    <DIR>      ..
14/09/2018  06.08    <DIR>      Bochs-2.3.5
16/09/2015  21.51            512 boots.bin
12/09/2016  12.33            0 bximage
14/09/2018  06.09    <DIR>      Dev-Cpp
17/12/2008  14.08            1.096.291 i386.pdf
14/09/2018  06.09    <DIR>      LAB
17/12/2008  14.07            846.920 pcasm-book.pdf
17/12/2008  15.44            86 Setpath.bat
14/12/2008  04.12            716.512 winima81.exe
                           6 File(s)   2.660.321 bytes
                           5 Dir(s)  89.815.441.408 bytes free

C:\OS>
```

### 3. Mengatur setpath

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\OS>cd C:\OS
C:\OS>dir
 Volume in drive C is System
 Volume Serial Number is 4A6B-68E6

 Directory of C:\OS

14/09/2018  06.09    <DIR>      .
14/09/2018  06.09    <DIR>      ..
14/09/2018  06.08    <DIR>      Bochs-2.3.5
16/09/2015  21.51        512 boots.bin
12/09/2016  12.33        0 bximage
14/09/2018  06.09    <DIR>      Dev-Cpp
17/12/2008  14.08        1.096.291 i386.pdf
14/09/2018  06.09    <DIR>      LAB
17/12/2008  14.07        846.920 pcasm-book.pdf
17/12/2008  15.44        86 Setpath.bat
14/12/2008  04.12        716.512 winima81.exe
14/12/2008  04.12        6 File(s)   2.660.321 bytes
14/12/2008  04.12        5 Dir(s)   89.815.441.408 bytes free

C:\OS>type setpath.bat
Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
```

### 4. Masuk pada direktori Lab/Lab1

```
R C:\Windows\system32\cmd.exe
C:\Users\User>cd C:\OS
C:\OS>dir
 Volume in drive C is System
 Volume Serial Number is 4A6B-68E6

 Directory of C:\OS

14/09/2018  06.09    <DIR>      .
14/09/2018  06.09    <DIR>      ..
14/09/2018  06.08    <DIR>      Bochs-2.3.5
16/09/2015  21.51        512 boots.bin
12/09/2016  12.33        0 bximage
14/09/2018  06.09    <DIR>      Dev-Cpp
17/12/2008  14.08        1.096.291 i386.pdf
14/09/2018  06.09    <DIR>      LAB
17/12/2008  14.07        846.920 pcasm-book.pdf
17/12/2008  15.44        86 Setpath.bat
14/12/2008  04.12        716.512 winima81.exe
14/12/2008  04.12        6 File(s)   2.660.321 bytes
14/12/2008  04.12        5 Dir(s)   89.815.441.408 bytes free

C:\OS>type setpath.bat
Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32

C:\OS>cd LAB\LAB1
C:\OS\LAB\LAB1>
```

## 5. Melihat isi dari file boot.asm dengan menggunakan notepad

```
C:\Windows\system32\cmd.exe
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\OS

14/09/2018  06.09    <DIR>          .
14/09/2018  06.09    <DIR>          ..
14/09/2018  06.08    <DIR>          Bochs-2.3.5
16/09/2015  21.51      512 boots.bin
12/09/2016  12.33          0 bximage
14/09/2018  06.09    <DIR>          Dev-Cpp
17/12/2008  14.08      1.096.291 1386.pdf
14/09/2018  06.09    <DIR>          LAB
17/12/2008  14.07      846.920 pcasm-book.pdf
17/12/2008  15.44          86 Setpath.bat
14/12/2008  04.12      716.512 winima81.exe
   6 File(s)   2.660.321 bytes
   5 Dir(s)  89.815.441.408 bytes free

C:\OS>type setpath.bat
Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Win

C:\OS>cd LAB\LAB1
C:\OS\LAB\LAB1>Notepad boot
C:\OS\LAB\LAB1>Notepad boot.asm
C:\OS\LAB\LAB1>

boot.asm - Notepad
File Edit Format View Help
; *****
; LAB-1 : boot-strap loader - real mode
; untuk memindahkan file OS dari floppy disk format DOS FAT12
;*****

; atur mode kerja 16 bit (real-mode)
[BITS 16]

; Menentukan lokasi awal dari program
[ORG 0x0000]

; loncat ke label START
jmp START

; Keterangan format floppy disk format FAT12

OEM_ID          db "QUASI-OS"
BytesPerSector  dw 0x0200
SectorsPerCluster db 0x01
ReservedSectors dw 0x0001
TotalFATs       db 0x02
MaxRootEntries  dw 0x00E0
TotalSectorsSmall dw 0x0840
MediaDescriptor db 0xF0
SectorsPerFAT   dw 0x0009
SectorsPerTrack dw 0x0012
NumHeads        dw 0x0002
HiddenSectors   dd 0x00000000
TotalSectorsLarge dd 0x00000000
DriveNumber     db 0x00
Flags           db 0x00

Activate Windows >
Go to Settings to activate Windows.
```

## 6. Membuka file teks makefile dengan menggunakan makefile, yang di mana berisi kumpulan perintah CMD.

```
C:\Windows\system32\cmd.exe
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\OS

14/09/2018  06.09    <DIR>          .
14/09/2018  06.09    <DIR>          ..
14/09/2018  06.08    <DIR>          Bochs-2.3.5
16/09/2015  21.51      512 boots.bin
12/09/2016  12.33          0 bximage
14/09/2018  06.09    <DIR>          Dev-Cpp
17/12/2008  14.08      1.096.291 1386.pdf
14/09/2018  06.09    <DIR>          LAB
17/12/2008  14.07      846.920 pcasm-book.pdf
17/12/2008  15.44          86 Setpath.bat
14/12/2008  04.12      716.512 winima81.exe
   6 File(s)   2.660.321 bytes
   5 Dir(s)  89.815.441.408 bytes free

C:\OS>type setpath.bat
Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Win

C:\OS>cd LAB\LAB1
C:\OS\LAB\LAB1>Notepad boot
C:\OS\LAB\LAB1>Notepad boot.asm
C:\OS\LAB\LAB1>Notepad Makefile
C:\OS\LAB\LAB1>

Makefile - Notepad
File Edit Format View Help
#
# LAB01 - Makefile
#
fp.disk: boot
        dd if=boot.bin of=floppya.img

boot: boot.asm
        nasm boot.asm -o boot.bin -f bin

kernel: kernel.asm
        nasm kernel.asm -o kernel.bin -f bin

clean:
        rm -f *.bin boot kernel

Activate Windows >
Go to Settings to activate Windows.
```

```
on C:\Windows\system32\cmd.exe
17/12/2008 15.44             86 Setpath.bat
14/12/2008 04.12             716.512 winimage81.exe
    6 File(s)   2.660 321 bytes
    5 Dir(s)  89.815.441.408 bytes free

C:\OS>type setpath.bat
Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32

C:\OS>cd LAB\LAB1
C:\OS\LAB\LAB1>Notepad boot
C:\OS\LAB\LAB1>Notepad boot.asm
C:\OS\LAB\LAB1>Notepad Makefile
C:\OS\LAB\LAB1>del floppya.img

C:\OS\LAB\LAB1>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\OS\LAB\LAB1

18/09/2018 10.20  <DIR> .
18/09/2018 10.20  <DIR> ..
12/09/2017 00.48      8.358 bochsout.txt
16/12/2008 06.17      1.628 bochsrc.bxrc
18/10/2016 04.36     14.339 boot.asm
18/10/2016 04.50      512 boot.bin
12/09/2017 00.37      512 boots.bin
17/09/2007 06.22     18.432 bximage.exe
12/09/2017 00.21     10.321.920 c.img
27/02/2007 10.50     342.016 dd.exe
15/12/2008 14.47      78 dosfp.bat
15/12/2008 01.45      7.966 kernel.asm
16/12/2008 06.21     227 Makefile
16/12/2008 02.20      44 s.bat
31/01/2000 19.00     261.120 tdump.exe
   13 File(s)   10.977.152 bytes
   2 Dir(s)  89.815.986.176 bytes free

Activate Windows
Go to Settings to activate Windows.

C:\OS\LAB\LAB1>
```

## 7. Menghapus suatu bootdisk yang bernama floppya.img dan cek pada direktori

```
on C:\Windows\system32\cmd.exe
17/12/2008 15.44             86 Setpath.bat
14/12/2008 04.12             716.512 winimage81.exe
    6 File(s)   2.660 321 bytes
    5 Dir(s)  89.815.441.408 bytes free

C:\OS>type setpath.bat
Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32

C:\OS>cd LAB\LAB1
C:\OS\LAB\LAB1>Notepad boot
C:\OS\LAB\LAB1>Notepad boot.asm
C:\OS\LAB\LAB1>Notepad Makefile
C:\OS\LAB\LAB1>del floppya.img

C:\OS\LAB\LAB1>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\OS\LAB\LAB1

18/09/2018 10.20  <DIR> .
18/09/2018 10.20  <DIR> ..
12/09/2017 00.48      8.358 bochsout.txt
16/12/2008 06.17      1.628 bochsrc.bxrc
18/10/2016 04.36     14.339 boot.asm
18/10/2016 04.50      512 boot.bin
12/09/2017 00.37      512 boots.bin
17/09/2007 06.22     18.432 bximage.exe
12/09/2017 00.21     10.321.920 c.img
27/02/2007 10.50     342.016 dd.exe
15/12/2008 14.47      78 dosfp.bat
15/12/2008 01.45      7.966 kernel.asm
16/12/2008 06.21     227 Makefile
16/12/2008 02.20      44 s.bat
31/01/2000 19.00     261.120 tdump.exe
   13 File(s)   10.977.152 bytes
   2 Dir(s)  89.815.986.176 bytes free

Activate Windows
Go to Settings to activate Windows.

C:\OS\LAB\LAB1>
```

## 8. Membuat suatu bootdisk baru dengan menggunakan aplikasi bximage.exe

Yang pertama pilih fd

C:\Windows\system32\cmd.exe - bximage  
C:\OS>cd LAB\LAB1  
C:\OS\LAB\LAB1>Notepad boot  
C:\OS\LAB\LAB1>Notepad boot.asm  
C:\OS\LAB\LAB1>Notepad Makefile  
C:\OS\LAB\LAB1>del floppya.img  
C:\OS\LAB\LAB1>dir  
Volume in drive C is System  
Volume Serial Number is 4A6B-68E6  
Directory of C:\OS\LAB\LAB1  
18/09/2018 10.20 <DIR> .  
18/09/2018 10.20 <DIR> ..  
12/09/2017 00.48 8.358 bochsout.txt  
16/12/2008 06.17 1.628 bochsrc.bxrc  
18/10/2016 04.36 14.339 boot.asm  
18/10/2016 04.50 512 boot.bin  
12/09/2017 00.37 512 boots.bin  
17/09/2007 06.22 18.432 bximage.exe  
12/09/2017 00.21 10.321.920 c.img  
27/02/2007 10.50 342.016 dd.exe  
15/12/2008 14.47 78 dosfp.bat  
15/12/2008 01.45 7.966 kernel.asm  
16/12/2008 06.21 227 Makefile  
16/12/2008 02.20 44 s.bat  
31/01/2000 19.00 261.120 tdump.exe  
13 File(s) 10.977.152 bytes  
2 Dir(s) 89.815.986.176 bytes free  
C:\OS\LAB\LAB1>bximage  
=====  
bximage  
Disk Image Creation Tool for Bochs  
\$Id: bximage.c,v 1.32 2006/06/16 07:29:33 vruppert Exp \$  
=====  
Do you want to create a floppy disk image or a hard disk image?  
Please type hd or fd. [hd] -

Kemudian untuk ukuran tekan enter untuk memilih default

C:\Windows\system32\cmd.exe - bximage  
C:\OS>cd LAB\LAB1  
C:\OS\LAB\LAB1>Notepad boot.asm  
C:\OS\LAB\LAB1>Notepad Makefile  
C:\OS\LAB\LAB1>del floppya.img  
C:\OS\LAB\LAB1>dir  
Volume in drive C is System  
Volume Serial Number is 4A6B-68E6  
Directory of C:\OS\LAB\LAB1  
18/09/2018 10.20 <DIR> .  
18/09/2018 10.20 <DIR> ..  
12/09/2017 00.48 8.358 bochsout.txt  
16/12/2008 06.17 1.628 bochsrc.bxrc  
18/10/2016 04.36 14.339 boot.asm  
18/10/2016 04.50 512 boot.bin  
12/09/2017 00.37 512 boots.bin  
17/09/2007 06.22 18.432 bximage.exe  
12/09/2017 00.21 10.321.920 c.img  
27/02/2007 10.50 342.016 dd.exe  
15/12/2008 14.47 78 dosfp.bat  
15/12/2008 01.45 7.966 kernel.asm  
16/12/2008 06.21 227 Makefile  
16/12/2008 02.20 44 s.bat  
31/01/2000 19.00 261.120 tdump.exe  
13 File(s) 10.977.152 bytes  
2 Dir(s) 89.815.986.176 bytes free  
C:\OS\LAB\LAB1>bximage  
=====  
bximage  
Disk Image Creation Tool for Bochs  
\$Id: bximage.c,v 1.32 2006/06/16 07:29:33 vruppert Exp \$  
=====  
Do you want to create a floppy disk image or a hard disk image?  
Please type hd or fd. [hd] fd  
choose the size of floppy disk image to create, in megabytes.  
Please type 0.16, 0.18, 0.32, 0.36, 0.72, 1.2, 1.44, 1.68, 1.72, or 2.88.  
[1.44]

Lalu beri nama. Di mana di sini diberi nama floppya.img

```
cmd C:\Windows\system32\cmd.exe - bximage
Volume Serial Number is 4A6B-68E6

Directory of C:\OS\LAB\LAB1

18/09/2018 10.20 <DIR> .
18/09/2018 10.20 <DIR> ..
12/09/2017 00.48 8.358 bochsout.txt
16/12/2008 06.17 1.628 bochsrc.brc
18/10/2016 04.36 14.339 boot.asm
18/10/2016 04.50 512 boot.bin
12/09/2017 00.37 512 boots.bin
17/09/2007 06.22 18.432 bximage.exe
12/09/2017 00.21 10.321.920 c.img
27/02/2007 10.50 342.016 dd.exe
15/12/2008 14.47 78 dosfp.bat
15/12/2008 01.45 7.966 kernel.asm
16/12/2008 06.21 227 Makefile
16/12/2008 02.20 44 s.bat
31/01/2000 19.00 261.120 tdump.exe
   13 File(s)  10.977.152 bytes free
   2 Dir(s)  89.815.986.176 bytes free

C:\OS\LAB\LAB1>bximage
=====
          bximage
Disk Image Creation Tool for Bochs
$Id: bximage.c,v 1.32 2006/06/16 07:29:33 vruppert Exp $

Do you want to create a floppy disk image or a hard disk image?
Please type hd or fd. [hd] fd

Choose the size of floppy disk image to create, in megabytes.
Please type 0.16, 0.18, 0.32, 0.36, 0.72, 1.2, 1.44, 1.68, 1.72, or 2.88.
[1.44]
I will create a floppy image with
cyl=80
heads=2
sectors per track=18
total sectors=2880
total bytes=1474560

What should I name the image?
[a.img] floppya.img
```

Activate Windows  
Go to Settings to activate Windows.

```
cmd C:\Windows\system32\cmd.exe
12/09/2017 00.21 10.321.920 c.img
27/02/2007 10.50 342.016 dd.exe
15/12/2008 14.47 78 dosfp.bat
15/12/2008 01.45 7.966 kernel.asm
16/12/2008 06.21 227 Makefile
16/12/2008 02.20 44 s.bat
31/01/2000 19.00 261.120 tdump.exe
   13 File(s)  10.977.152 bytes free
   2 Dir(s)  89.815.986.176 bytes free

C:\OS\LAB\LAB1>bximage
=====
          bximage
Disk Image Creation Tool for Bochs
$Id: bximage.c,v 1.32 2006/06/16 07:29:33 vruppert Exp $

Do you want to create a floppy disk image or a hard disk image?
Please type hd or fd. [hd] fd

Choose the size of floppy disk image to create, in megabytes.
Please type 0.16, 0.18, 0.32, 0.36, 0.72, 1.2, 1.44, 1.68, 1.72, or 2.88.
[1.44]
I will create a floppy image with
cyl=80
heads=2
sectors per track=18
total sectors=2880
total bytes=1474560

What should I name the image?
[a.img] floppya.img

Writing: [] Done.

I wrote 1474560 bytes to floppya.img.

The following line should appear in your bochsrc:
  floppy: image="floppya.img", status=inserted
(The line is stored in your windows clipboard, use CTRL-V to paste)

Press any key to continue
```

Activate Windows  
Go to Settings to activate Windows.

## 9. Cek isi direktori kembali apakah floppya.img telah dibuat.

```
C:\Windows\system32\cmd.exe
heads=2
sectors per track=18
total sectors=2880
total bytes=1474560

What should I name the image?
[a.img] floppya.img

Writing: [] Done.

I wrote 1474560 bytes to floppya.img.

The following line should appear in your bochsrc:
floppya: image=floppya.img, status=inserted
(The line is stored in your windows clipboard, use CTRL-V to paste)

Press any key to continue
C:\OS\LAB\LAB1>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\OS\LAB\LAB1

18/09/2018 10.24 <DIR> .
18/09/2018 10.24 <DIR> ..
12/09/2017 00.48 8.358 bochsout.txt
16/12/2008 06.17 1.628 bochsrc.bxrc
18/10/2016 04.36 14.339 boot.asm
18/10/2016 04.50 512 boot.bin
12/09/2017 00.37 512 boots.bin
17/09/2007 06.22 18.432 bximage.exe
12/09/2017 00.21 10.321.920 c.img
27/02/2007 18.50 342.016 dd.exe
15/12/2008 14.47 78 dosfp.bat
18/09/2018 10.24 1.474.560 floppya.img
15/12/2008 01.45 7.966 kernel.asm
16/12/2008 06.21 227 Makefile
16/12/2008 02.20 44 s.bat
16/12/2008 02.20 44 s.bat
31/01/2000 19.00 261.120 tdump.exe
               14 File(s)   12.451.712 bytes
               2 Dir(s)  89.813.987.328 bytes free

C:\OS\LAB\LAB1>
```

Activate Windows  
Go to Settings to activate Windows.

## 10. Kemudian format floppya.img agar menjadi bootdisk.

```
C:\OS\LAB\LAB1>Bochs
Bochs for Windows - Console
15/12/2008 14.47 78 dosfp.bat
18/09/2018 10.24 1.474.560 floppya.img
15/12/2008 01.45 7.966 kernel.asm
16/12/2008 06.21 227 Makefile
16/12/2008 02.20 44 s.bat
31/01/2000 19.00 261.120 tdump.exe
               14 File(s)   12.451.712 bytes
               2 Dir(s)  89.813.987.328 bytes free

C:\OS\LAB\LAB1>DosFp
C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[      ] reading configuration from bochsrc2.txt
000000000001[      ] installing win32 module as the Bochs GUI
000000000001[      ] using log file bochsout.txt
# In bx_wm32_gui.c::exit(void)
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab1"
C:\OS\LAB\LAB1>Format B:
Insert new diskette for drive B:
and press ENTER when ready...
Bochs for Windows - Display
=====
MSCDEX Version 2.23
Copyright (C) Microsoft Corp. 1986-1993. All rights reserved.

A:>Format B:
Insert new diskette for drive B:
and press ENTER when ready...
Checking existing disk format.
Formatting 1.44M
Format complete.
Volume label (11 characters, ENTER for none)?
      1,457,664 bytes total disk space
      1,457,664 bytes available on disk
          512 bytes in each allocation unit.
          2,847 allocation units available on disk.
Volume Serial Number is 422F-120A
Format another (Y/N)?n

C:\OS\LAB\LAB1>DosFp
C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[      ] reading configuration from bochsrc2.txt
000000000001[      ] installing win32 module as the Bochs GUI
000000000001[      ] using log file bochsout.txt
```

Activate Windows  
Go to Settings to activate Windows.

## 11. Kemudian salin byte dari floppya.img ke boots.bin yang digunakan untuk bootloader

```
C:\Windows\system32\cmd.exe
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochcout.txt
# In bx_win32_gui.c::exit(void)

Bochs is exiting with the following message:
[!GUI] POWER button turned off.

=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab1"

C:\OS\LAB\LAB1>DOSFP

C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochcout.txt
# In bx_win32_gui.c::exit(void)

Bochs is exiting with the following message:
[!GUI] POWER button turned off.

=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab1"

C:\OS\LAB\LAB1>dd if=floppya.img of=boots.bin count=1
rawwrite dd for windows version 0.5.
Written by John Newbiggin <jn@lt.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
1+0 records in
1+0 records out

C:\OS\LAB\LAB1>
```

Activate Windows  
Go to Settings to activate Windows.

## 12. Melihat isi memori dari boots.bin

```
C:\Windows\system32\cmd.exe
=====
C:\OS\LAB\LAB1>debug boots.bin
'debug' is not recognized as an internal or external command,
operable program or batch file.

C:\OS\LAB\LAB1>tDump boots.bin
Turbo Dump Version 5.0.16.12 Copyright (c) 1988, 2000 Inprise Corporation
Display of File BOOTS.BIN

000000: EB 3C 90 4D 53 57 49 4E 34 2E 31 00 02 01 01 00 .<.MSWIN4.1....
000010: 02 E0 00 40 0B F0 09 00 12 00 02 00 00 00 00 00 ...@. .....
000020: 00 00 00 00 00 00 29 0A 12 2F 42 4E 4F 20 4E 41 .....).BNO NA
000030: 0D 45 20 20 20 20 46 41 54 31 32 20 20 20 33 C9 ME FAT12 3.
000040: 8E D1 BC FC 7B 16 07 BD 78 00 C5 76 00 1E 56 16 ....{..x..v..V.
000050: 55 BF 22 05 89 7E 00 89 4E 02 B1 00 FC F3 A4 00 U."..~.N.....
000060: 1F BD 00 7C C6 45 FE 0F 38 4E 24 7D 20 8B C1 99 ...|.E..8%$} ...
000070: E8 7E 01 83 EB 3A 66 01 1C 7C 66 3B 07 8A 57 FC ....|.F.;.W.
000080: 75 00 88 CA 02 88 56 02 88 C3 18 73 ED 33 C9 FE U.....V....S.3..
000090: 06 D0 7D 8A 46 10 98 F7 66 16 03 46 1C 13 56 1F ...}.F.;.F.;.V.
0000A0: 03 46 0E 13 D1 8B 76 11 60 88 46 FC 80 56 FE BB ..F.....v...F.;.V..
0000B0: 20 00 F7 E6 88 5E 0B 03 C3 48 F7 F3 01 46 FC 11 ..^..H..F.;.
0000C0: 4E FE 61 BF 00 07 E8 28 01 72 3E 38 2D 74 17 60 N.a....(.r>8-t..
0000D0: B1 00 BE D8 7D F3 A6 61 74 3D 4E 74 09 83 C7 20 ....).at-Nt...
0000E0: 3B FB 72 E7 EB DD FE 0E 08 70 78 A7 BE 7F 7D AC ;.r....\M{.}.
0000F0: 98 03 F0 AC 98 49 74 0C 48 74 13 B4 0E BB 07 00 .....@t.Ht...
000100: CD 10 EB EF BE 82 7D EB E6 BE 80 7D EB E1 CD 16 .....).r.....
000110: 5E 1F 66 9F 04 CD 19 0E 81 7D 88 70 1A 80 45 FE ^..F.....1.).E.
000120: 8A 4E 00 F7 E1 03 46 FC 13 56 FE B1 04 E8 C2 00 .N....F.;.V. .....
000130: 72 D7 EA 00 02 70 00 52 50 06 53 6A 01 6A 16 91 P...P.RP.Sj.j.
000140: 88 46 18 A2 26 05 95 02 33 D2 F7 F6 91 F6 42 .F.;.8...3....B
000150: 87 CA F7 76 1A 8A F2 8A E8 C8 CC 02 0A CC 88 01 ...v.....
000160: 02 89 7E 02 0E 75 04 84 42 88 F4 8A 56 24 CD 13 ..~..U..B..V$..
000170: 61 61 72 0A 48 75 01 42 03 5E 08 49 75 77 C3 03 aar@.U.B.^..Iuw.
000180: 18 01 27 00 0A 49 6E 76 61 6C 69 64 20 73 79 73 ...Invalid sys
000190: 74 65 60 20 64 69 73 68 FF 00 0A 44 69 73 68 20 tem disk...Disk
0001A0: 49 2F 4F 20 65 72 6F 72 FF 00 0A 52 65 78 6C I/O error...Repl
0001B0: 61 63 65 20 74 68 65 20 04 69 73 6B 2C 20 61 6E ace the disk, an
0001C0: 64 20 74 68 65 6E 20 70 72 65 73 73 28 61 6E 79 d then press any
0001D0: 20 68 65 79 00 0A 00 00 49 4F 20 20 20 20 28 20 key....IO
0001E0: 53 59 53 4D 53 44 4F 53 20 20 53 59 53 7F 01 SYMSDOS ..SYS...
0001F0: 00 41 BB 00 07 60 66 6A 00 E9 3B FF 00 00 55 AA .A... fJ.;....U.

C:\OS\LAB\LAB1>
```

Activate Windows  
Go to Settings to activate Windows.

### 13. Memanggil Bosch.

```
C:\Windows\system32\cmd.exe
operable program or batch file.

C:\OS\LAB\LAB1>tdump boots.bin
turbo Dump Version 5.0.16.12 Copyright (c) 1988, 2000 Inprise Corporation
Display Of File BOOTS.BIN

000000: EB 3C 90 4D 53 57 49 4E 34 2E 31 00 02 01 01 00 .<.MSWIN4.1.....
000010: 02 E0 00 40 08 F0 09 00 12 00 02 00 00 00 00 00 ...@.....
000020: 00 00 00 00 00 00 29 0A 12 2F 42 4E 4F 20 4E 41 .....).//BNO NA
000030: D0 45 20 20 20 26 46 41 54 31 32 20 20 33 C9 ME FAT12 3.
000040: 8E D1 BC FC 7B 16 07 BD 78 00 C5 76 00 1E 56 16 ....{...x..v..V.
000050: 55 BF 22 05 89 7E 00 89 4E 02 B1 08 FC F3 A4 06 U."...N.....
000060: 1F B0 00 7C C6 45 FE 0F 38 4E 24 7D 20 88 C1 90 ...).E..8N$} .....
000070: E8 7E 01 B3 CA 36 A1 1C 7C 66 3B 07 8A 57 Fc ...f...[f]..W.
000080: 75 00 80 CA 02 88 56 02 88 C3 10 73 ED 33 C9 FE u.....V....s.3..
000090: 06 D8 7D 8A 46 10 98 F7 66 10 03 46 1C 13 56 1E ...}.F...f..F..V.
0000A0: 03 46 0E 13 D1 8B 76 11 60 89 46 Fc 89 56 FE BB ..F...v.`F..V..
0000B0: 20 00 F7 E6 88 5E 00 93 C3 48 F7 F3 01 46 FC 11 ....^...H..F..
0000C0: 4E FE 61 BF 00 07 E8 28 01 72 3E 38 2D 74 17 60 N.a....(.r>8-t.
0000D0: B1 00 BE DB 7D F3 A6 61 74 3D 4E 74 09 83 C7 20 ....}.at-NT...
0000E0: 3B FB 72 E7 EB DD FE 0E D8 7D 78 A7 BE 7F 7D A7 :r.....}{...}.
0000F0: 98 00 F0 AC 98 40 7C 0C 48 74 13 B4 0E BB 07 00 .....@t.Ht....
000100: CD 10 EB EF BE 82 7D EB E6 B0 80 7D EB E1 CD 16 .....}.
000110: 5E 1F 66 8F 04 CD 19 BE 81 70 88 7D 1A 8D 45 FE ^..f...}.).E.
000120: 8A 4E 0D F7 E1 03 46 FC 13 56 FE B1 04 E8 C2 00 .N...F..V..
000130: 72 D7 EA 00 20 70 00 52 50 00 53 6A 01 6A 10 91 r...p.RP.Sj.j.
000140: 88 46 18 A2 26 85 96 92 33 D2 F7 F6 91 F7 F6 42 ..F..&..3....B
000150: 87 CA F7 76 1A 8A F2 8A EB C0 CC 02 0A CC B8 01 ....V.....
000160: 02 88 7E 02 0E 75 04 B4 42 88 F4 8A 56 24 CD 13 ..~..u..B...V$..
000170: 61 61 72 0A 40 75 01 02 93 5E 0B 75 77 C3 03 aar.@u.B.^Iu..
000180: 18 01 27 0D 0A 49 6E 76 61 66 69 64 26 73 79 73 ...'.Invalid sys
000190: 74 65 6D 20 64 69 73 6B FF 00 0A 44 69 73 6B 20 tem disk..Disk
0001A0: 49 2F 4F 20 65 72 72 6F 72 FF 0D 0A 52 65 78 6C I/O error...Repl
0001B0: 61 63 65 20 74 68 65 28 64 69 73 68 2C 20 61 6E ace the disk, an
0001C0: 64 2A 74 68 65 6E 20 78 72 65 73 73 28 61 6E 79 d then press any
0001D0: 20 68 65 79 00 00 00 49 4E 20 28 20 28 20 key...IO
0001E0: 53 59 53 4D 53 44 4F 53 20 20 53 59 53 7F 01 SYSMSDOS  SYS..
0001F0: 00 41 BB 00 07 00 66 0A 00 E9 3B FF 00 00 55 AA .A...fj.;....U.

C:\OS\LAB\LAB1>type s.bat
..\\bochs-2.3.5\bochs -q -f bochsrc.bxrc
C:\OS\LAB\LAB1>
```

Activate Windows  
Go to Settings to activate Windows.

### 14. Format floppya.img, dan menambahkan sistem file ke dalamnya, dengan bantuan bosch.

```
Bosch for Windows - Console
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
# In bx-win32_gui.c::exit(void)

Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
=====

C:\OS\LAB\LAB1>
C:\OS\LAB\LAB1>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
# In bx-win32_gui.c::exit(void)

Bochs is exiting with the following message:
[WGUI ] Window closed, exiting!
=====

Bochs is exiting. Press ENTER when you're ready to close this window.

C:\OS\LAB\LAB1>DOSFP
C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
```

Activate Windows  
Go to Settings to activate Windows.

## 15. Selesaikan proses format

The screenshot shows a Bochs for Windows - Console window and a Bochs for Windows - Display window. In the console window, the user runs 'bochs -q -f bochsrc2.txt' to start the emulator. It then runs 'format b:s' to format drive B. The display window shows the format progress: 'Insert new diskette for drive B:' and 'Format complete. System transferred'. The volume label is set to '1B43-16E5'. The volume serial number is also shown. A message asks if the user wants to format another disk ('Format another (Y/N)?'). The status bar at the bottom indicates 'CTRL + 3rd button enables mouse'.

```
# In bx_win32_gui c::exit(void)
=====
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab1"
C:\OS\LAB\LAB1>DosFp
C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
# In bx_win32_gui c::exit(void)
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab1"
C:\OS\LAB\LAB1>DosFp
C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
```

Bochs for Windows - Display

A:>Format B:S  
Insert new diskette for drive B:  
and press ENTER when ready...

Checking existing disk format.  
Verifying 1.44M  
Format complete.  
System transferred

Volume label (11 characters, ENTER for none)?  
1B43-16E5  
1,457,664 bytes total disk space  
221,696 bytes used by system  
1,235,968 bytes available on disk  
512 bytes in each allocation unit.  
2,414 allocation units available on disk.

Volume Serial Number is 1B43-16E5

Format another (Y/N)?n

A:>

CTRL + 3rd button enables mouse A: B: HD:0-N CD:0-S NUM CAPS SCRL

Activate Windows  
Go to Settings to activate Windows.

## 16. Lihat isi direktori

The screenshot shows a Bochs for Windows - Console window and a Bochs for Windows - Display window. In the console window, the user runs 'dir B:' to list the contents of drive B. The display window shows the directory listing: 'Volume in drive B has no label' and 'Volume Serial Number is 1B43-16E5'. The directory of B:\ is shown, containing a single file 'COM' with 94,292 bytes and 1 directory with 1,235,968 bytes free. The status bar at the bottom indicates 'CTRL + 3rd button enables mouse'.

```
# In bx_win32_gui c::exit(void)
=====
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab1"
C:\OS\LAB\LAB1>DosFp
C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
# In bx_win32_gui c::exit(void)
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab1"
C:\OS\LAB\LAB1>DosFp
C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
```

Bochs for Windows - Display

A:>dir B:

Volume in drive B has no label  
Volume Serial Number is 1B43-16E5  
Directory of B:\

COMMAND	COM	94,292	05-05-03	21:22
	1 file(s)	94,292 bytes		
	0 dir(s)	1,235,968 bytes free		

A:>

CTRL + 3rd button enables mouse A: B: HD:0-N CD:0-S NUM CAPS SCRL

Activate Windows  
Go to Settings to activate Windows.

## Tugas

1. Kode ASCII adalah merupakan kode standar yang digunakan dalam pertukaran informasi pada Komputer. Kode ASCII ini seperti Hex dan Unicode tetapi ASCII lebih bersifat universal.

## ASCII Table

Dec	Hex	Oct	Char	Dec	Hex	Oct	Char	Dec	Hex	Oct	Char	Dec	Hex	Oct	Char
0	0	0		32	20	40	[space]	64	40	100	@	96	60	140	`
1	1	1	!	33	21	41	"	65	41	101	A	97	61	141	a
2	2	2	"	34	22	42	#	66	42	102	B	98	62	142	b
3	3	3	#	35	23	43	\$	67	43	103	C	99	63	143	c
4	4	4	\$	36	24	44	%	68	44	104	D	100	64	144	d
5	5	5	%	37	25	45	&	69	45	105	E	101	65	145	e
6	6	6	&	38	26	46	*	70	46	106	F	102	66	146	f
7	7	7	*	39	27	47	,	71	47	107	G	103	67	147	g
8	8	10	,	40	28	50	(	72	48	110	H	104	68	150	h
9	9	11	(	41	29	51	)	73	49	111	I	105	69	151	i
10	A	12	)	42	2A	52	*	74	4A	112	J	106	6A	152	j
11	B	13	*	43	2B	53	+	75	4B	113	K	107	6B	153	k
12	C	14	+	44	2C	54	,	76	4C	114	L	108	6C	154	l
13	D	15	,	45	2D	55	-	77	4D	115	M	109	6D	155	m
14	E	16	-	46	2E	56	.	78	4E	116	N	110	6E	156	n
15	F	17	.	47	2F	57	/	79	4F	117	O	111	6F	157	o
16	10	20	/	48	30	60	0	80	50	120	P	112	70	160	p
17	11	21	0	49	31	61	1	81	51	121	Q	113	71	161	q
18	12	22	1	50	32	62	2	82	52	122	R	114	72	162	r
19	13	23	2	51	33	63	3	83	53	123	S	115	73	163	s
20	14	24	3	52	34	64	4	84	54	124	T	116	74	164	t
21	15	25	4	53	35	65	5	85	55	125	U	117	75	165	u
22	16	26	5	54	36	66	6	86	56	126	V	118	76	166	v
23	17	27	6	55	37	67	7	87	57	127	W	119	77	167	w
24	18	30	7	56	38	70	8	88	58	130	X	120	78	170	x
25	19	31	8	57	39	71	9	89	59	131	Y	121	79	171	y
26	1A	32	9	58	3A	72	:	90	5A	132	Z	122	7A	172	z
27	1B	33	:	59	3B	73	;	91	5B	133	{	123	7B	173	{
28	1C	34	;	60	3C	74	<	92	5C	134	\	124	7C	174	
29	1D	35	<	61	3D	75	=	93	5D	135	]	125	7D	175	}
30	1E	36	=	62	3E	76	>	94	5E	136	^	126	7E	176	~
31	1F	37	>	63	3F	77	?	95	5F	137	-	127	7F	177	

2. Perintah Bahasa assembly untuk keluarga intel x86

- Komentar: Komentar diawali dengan tanda titik koma (:). ; ini adalah komentar
- Label : Label diakhiri dengan tanda titik dua (:). Contoh: main: ,loop: ,proses: ,keluar:
- Definisi data: **DB** : define bytes. **DW** : define words. **DD** : define double words. **EQU** : equals. Membentuk konstanta.
- Perpindahan data **MOV** : move. **LEA** : load effective address. Mengisi suatu register dengan alamat offset sebuah data. **CHG** : exchange. Menukar dua buah register langsung.
- Operasi logika: **AND** : melakukan bitwise and. sintaks: **OR** : melakukan bitwise or. **NOT** : melakukan bitwise not (*one's complement*). **XOR** : melakukan bitwise eksklusif or. **SHL** : shift left. Menggeser bit ke kiri. Bit paling kanan diisi nol. **HR** : shift right. Menggeser bit ke kanan. Bit paling kiri diisi nol. **ROL** : rotate left. Memutar bit ke kiri. Bit paling kiri jadi paling kanan kali ini. **ROR** : rotate right. Memutar bit ke kanan. Bit paling kanan jadi paling kiri.
- Operasi matematika: **ADD** : add. Menjumlahkan dua buah register. **ADC** : add with carry. Menjumlahkan dua register dan carry flag (CF). **INC** : increment. Menjumlah isi sebuah register dengan 1. **BB** : subtract with borrow. Mengurangkan dua register dan carry flag (CF). **DEC** : decrement. Mengurang isi sebuah register dengan 1. **MUL** : multiply. Mengalikan register dengan AX atau AH. **UL** : signed multiply. **DIV** : divide. Membagi AX atau DX:AX dengan sebuah register. **IDIV** : signed divide. Sama dengan DIV, hanya saja IDIV menganggap bit-bit yang ada di register sumber sudah dalam bentuk *two's complement*. **NEG** : negate. Membuat isi register menjadi negatif (*two's complement*).
- Pengulangan: **LOOP** : loop. Mengulang sebuah proses. Pertama register CX dikurangi satu. Bila CX sama dengan nol, maka looping berhenti. Bila tidak nol, maka

lompat ke label tujuan. **LOOPE** : loop while equal. Melakukan pengulangan selama CX  $\neq 0$  dan ZF = 1. CX tetap dikurangi 1 sebelum diperiksa. sintaks: **LOOPZ** : loop while zero. Identik dengan LOOPE. **LOOPNE** : loop while not equal. Melakukan pengulangan selama CX  $\neq 0$  dan ZF = 0. CX tetap dikurangi 1 sebelum diperiksa. **LOOPNZ** : loop while not zero. Identik dengan LOOPNE. **REP** : repeat. Mengulang perintah sebanyak CX kali.

## Praktikum 2

Nama : Muhammad Khoiruddin

NIM : L200170104

Kelas : E

1. Masuk ke direktori C:/OS dan melakukan setpath, kemudia masuk ke dorektori lab/lab2. Kemudia lakukan dir untuk mengecek isi dari direktori

```
Command Prompt
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

E:\Users\User>cd C:/OS
C:\OS>setpath
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
C:\OS>cd Lab/Lab2
C:\OS\LAB\LAB2>
```

The screenshot shows a Windows Command Prompt window titled "Command Prompt". The title bar includes standard window controls (minimize, maximize, close). The window content displays a series of commands entered at the prompt: "E:\Users\User>cd C:/OS", "C:\OS>setpath", and "C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32". Following this, the command "C:\OS>cd Lab/Lab2" is run, changing the current directory to "C:\OS\LAB\LAB2". The prompt then changes to "C:\OS\LAB\LAB2>". At the bottom of the window, there is a watermark-like text "Activate Windows Go to Settings to activate Windows." The taskbar at the bottom of the screen shows various pinned icons, and the system tray indicates the date and time as 20.51.

```
Command Prompt
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:/OS
C:\OS>setpath
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
C:\OS>cd Lab/Lab2
C:\OS\LAB\LAB2>
```

This screenshot is identical to the one above, showing a second instance of a Windows Command Prompt window. It displays the same sequence of commands: "cd C:/OS", "setpath", and "Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32", followed by "cd Lab/Lab2" and the resulting prompt "C:\OS\LAB\LAB2>". The watermark "Activate Windows Go to Settings to activate Windows." is also present at the bottom. The taskbar and system tray are visible at the bottom.

```
on Command Prompt
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:/OS
C:\OS>setpath
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
C:\OS>cd LAB/Lab2
C:\OS\LAB\LAB2>
```

Activate Windows  
Go to Settings to activate Windows.

## 2. Kemudian buat suatu file bernama “floppya.img”, dengan bantuan aplikasi bximage

```
C:\Windows\system32\cmd.exe
21/09/2018 20.53      1.474.560 floppya.img
19/09/2018 12.09      7.966 kernel.asm
08/09/2016 20.36      684 kernel.bin
15/12/2008 23.21      228 Makefile
15/12/2008 19.20      44 s.bat
12 File(s)   1.872.117 bytes
2 Dir(s)  87.873.486.848 bytes free

C:\OS\LAB\LAB2>del floppya.img
C:\OS\LAB\LAB2>bximage
=====
          bximage
          Disk Image Creation Tool for Bochs
$!d: bximage.c,v 1.32 2006/06/16 07:29:33 vruppert Exp $
=====

Do you want to create a floppy disk image or a hard disk image?
Please type hd or fd. [hd] fd

Choose the size of floppy disk image to create, in megabytes.
Please type 0.16, 0.18, 0.32, 0.36, 0.72, 1.2, 1.44, 1.68, 1.72, or 2.88.
[1.44]
I will create a floppy image with
  cyl=80
  heads=2
  sectors per track=18
  total sectors=2880
  total bytes=1474560

What should I name the image?
[fa.img] floppya.img

Writing: [] Done.

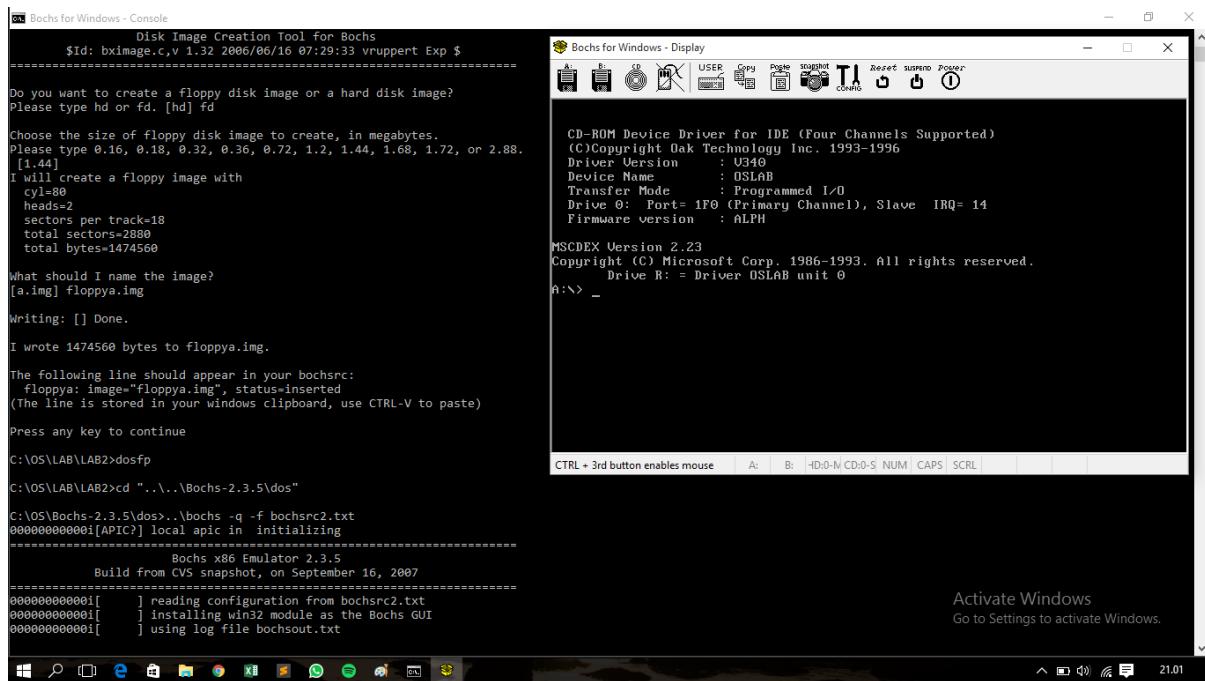
I wrote 1474560 bytes to floppya.img.

The following line should appear in your bochsrc:
  floppy: image="floppya.img", status=inserted
(The line is stored in your windows clipboard, use CTRL-V to paste)

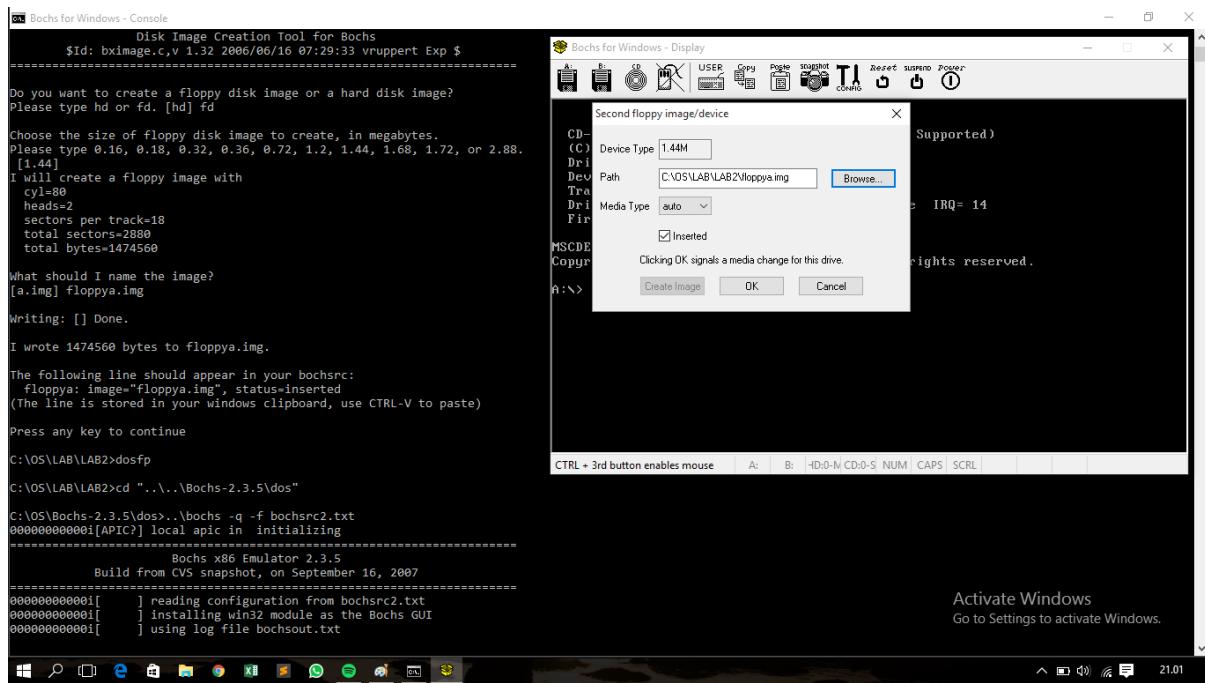
Press any key to continue
```

Activate Windows  
Go to Settings to activate Windows.

### 3. Kemudian format floppya.img dengan mengisi DOS ke dalamnya



### 4. Aturl lokassi floppya.img yang ada dalam folder lab2. Kemudia lakukan pemformatan.



Bochs for Windows - Console

```

Disk Image Creation Tool for Bochs
$!d: bximage.c,v 1.32 2006/06/16 07:29:33 vruppert Exp $ -----
Do you want to create a floppy disk image or a hard disk image?
Please type hd or fd. [hd] fd
Choose the size of floppy disk image to create, in megabytes.
Please type 0.16, 0.18, 0.32, 0.36, 0.72, 1.2, 1.44, 1.68, 1.72, or 2.88.
[1.44]
I will create a floppy image with
  cyl=80
  heads=2
  sectors per track=18
  total sectors=2880
  total bytes=1474560

What should I name the image?
[a.img] floppya.img

Writing: [] Done.

I wrote 1474560 bytes to floppya.img.

The following line should appear in your bochsrc:
  floppy: image="floppya.img", status=inserted
(The line is stored in your windows clipboard, use CTRL-V to paste)

Press any key to continue
C:\OS\LAB\LAB2>dosfp

C:\OS\LAB\LAB2>cd ..\..\Bochs-2.3.5\dos
C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[    ] reading configuration from bochsrc2.txt
000000000001[    ] installing win32 module as the Bochs GUI
000000000001[    ] using log file bochsout.txt
# In bx_win32_gui_c::exit(void)

Bochs is exiting with the following message:
[WGUI ] POWER button turned off.

=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab2"
C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[    ] reading configuration from bochsrc.bxrc
000000000001[    ] installing win32 module as the Bochs GUI
000000000001[    ] using log file bochs.log
# In bx_win32_gui_c::exit(void)

Bochs is exiting with the following message:
[WGUI ] POWER button turned off.

=====
C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floppya.img
rawrite dd for windows version 0.5.
written by John Newbigin <jn@it.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
1+0 records in
1+0 records out
=====
```

Bochs for Windows - Display

```

Drive R: = Driver OSLaB unit 0
A:> Format B: /S
Insert next diskette for drive B:
and press ENTER when ready...

Checking existing disk format.
Formatting 1.44M
Format complete.
System transferred

Volume label (11 characters, ENTER for none)?
1,457,664 bytes total disk space
221,696 bytes used by system
1,235,968 bytes available on disk
      512 bytes in each allocation unit.
      2,414 allocation units available on disk.

Volume Serial Number is 0C1A-1CF
Format another (Y/N)?n

A:>
=====
```

Activate Windows  
Go to Settings to activate Windows.

5. Memasukkan source code dari boot.asm ke bootsector “floppya.img”. Kemudian jalankan perintah make fp.disk

C:\Windows\system32\cmd.exe

```

C:\OS\Bochs-2.3.5\dos>..\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[    ] reading configuration from bochsrc2.txt
000000000001[    ] installing win32 module as the Bochs GUI
000000000001[    ] using log file bochsout.txt
# In bx_win32_gui_c::exit(void)

Bochs is exiting with the following message:
[WGUI ] POWER button turned off.

=====
C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab2"
C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
000000000001[    ] reading configuration from bochsrc.bxrc
000000000001[    ] installing win32 module as the Bochs GUI
000000000001[    ] using log file bochs.log
# In bx_win32_gui_c::exit(void)

Bochs is exiting with the following message:
[WGUI ] POWER button turned off.

=====
C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floppya.img
rawrite dd for windows version 0.5.
written by John Newbigin <jn@it.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
1+0 records in
1+0 records out
=====
```

Activate Windows  
Go to Settings to activate Windows.

## 6. Lalu ketikkan ‘S’

The screenshot shows two windows side-by-side. On the left is the 'Bochs for Windows - Console' window displaying command-line output. On the right is the 'Bochs for Windows - Display' window showing a graphical user interface with various icons and a message about the BIOS version.

```

C:\OS\Bochs-2.3.5>dos>cd "C:\os\lab\lab2"
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.

=====
C:\OS\LAB\LAB2>s
=====
C:\OS\LAB\LAB2>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
# In bx_wins2_gui.c::exit(void)
=====
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.

=====
C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floppya.img
rawwrite dd for windows version 0.5.
Written by John Newbegin <jn@it.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
1+0 records in
1+0 records out

C:\OS\LAB\LAB2>s
=====
C:\OS\LAB\LAB2>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
  
```

## 7. Selanjutnya suntukng boot.asm dengan mengetikkan ‘notepad boot.asm’ di mana membuka file boot.asm dengan menggunakan notepad. Kemudian ganti msgLoading sesuai perintah. Dan ganti error dengan nama dan nim.

The screenshot shows the Command Prompt window on the left and the Notepad window on the right. The Notepad window displays the assembly code for boot.asm, specifically focusing on the msgLoading, msgCRLF, and msgProgress lines.

```

C:\OS\Bochs-2.3.5>dos>..\\bochs -q -f bochsrc2.txt
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc2.txt
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochsout.txt
# In bx_wins2_gui.c::exit(void)
=====
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.

=====
C:\OS\Bochs-2.3.5>dos>cd "C:\os\lab\lab2"
C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floppya.img
rawwrite dd for windows version 0.5.
Written by John Newbegin <jn@it.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
1+0 records in
1+0 records out

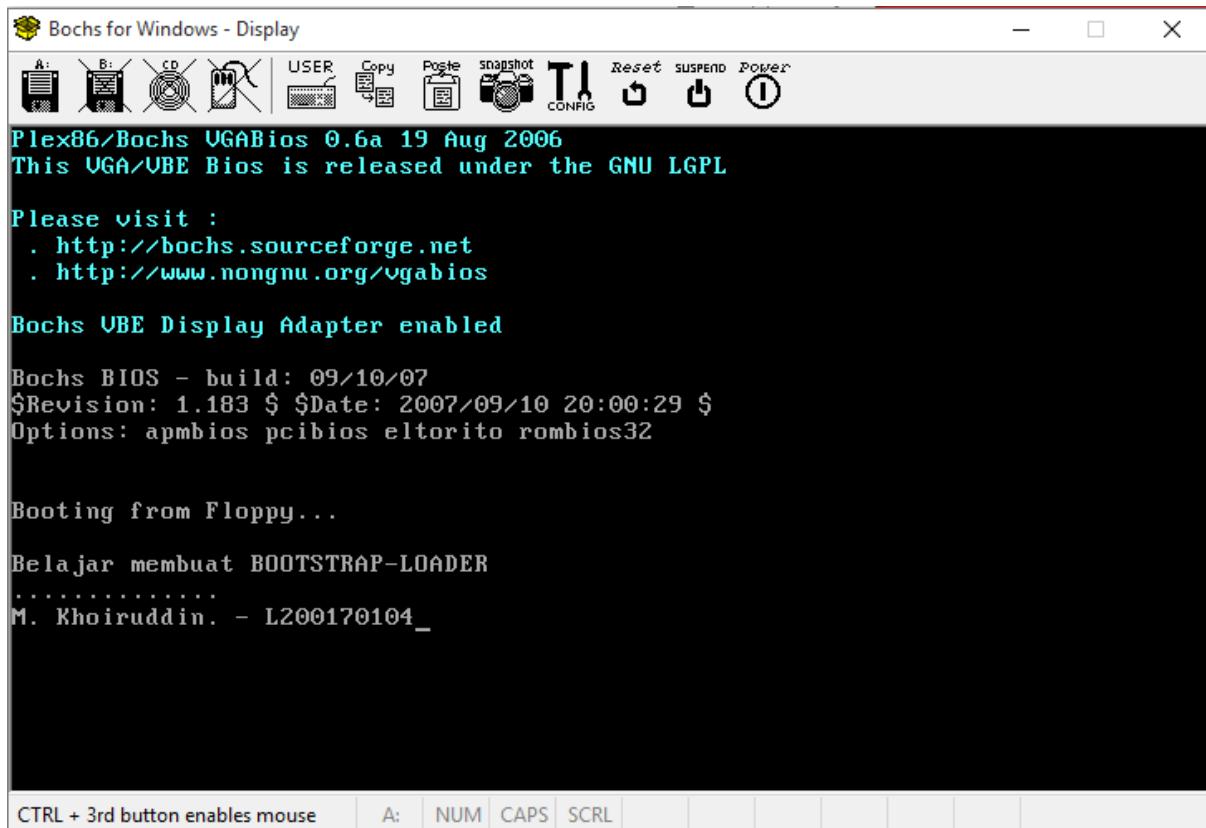
C:\OS\LAB\LAB2>notepad boot.asm
  
```

**Notepad Content:**

```

boot.asm - Notepad
File Edit Format View Help
datasector dw 0x0000
cluster dw 0x0000
=====
; Definisi NAMA file OS/Kernel
; 11 Karakter: Terdiri dari
; 8 Karakter untuk nama file,
; 3 Karakter untuk extensi
; Tanpa TITIK '.' pemisah
; perintah 'dir' akan menampilkan 'KERNEL.BIN'
=====
imageName db "KERNEL BIN"

;
; Teks yang akan ditampilkan saat mulai proses
; BOOT : Loading kernel ver 0.01
; Di awali dan diakhiri dengan tanda :
; -- 0x0D akhir baris
; -- 0x0A baris baru
; -- 0x00 Karakter 'NULL' pembatas dengan data di bawahnya
;
msgLoading db 0x0D, 0x0A, "Belajar membuat BOOTSTRAP-LOADER"
msgCRLF db 0x0D, 0x0A, 0x00
msgProgress db ".", 0x00
;
; Teks yang di tampilkan saat terjadi kesalahan BOOT
;
msgFailure db 0x0D, 0x0A, "M. Khoiruddin - L200170104", 0x00
;
;(4) BLOK BOOT SIGNATURE
;
TIMES 510-( $$ ) DB 0
  
```



8. Ketikkan make kernel. Kemudian cek apakah sudah ada file baru bernama “kernel.bin”

```

C:\Windows\system32\cmd.exe
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
# In bx_win32_gui_c::exit(void)

Bochs is exiting with the following message:
[MGUI ] POWER button turned off.
=====

C:\OS\LAB\LAB2>notepad boot.asm
C:\OS\LAB\LAB2>make fp_disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floppya.img
rawwrite dd for windows version 0.5.
Written by John Newbigin <jn@it.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
1+0 records in
1+0 records out

C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
# In bx_win32_gui_c::exit(void)

Bochs is exiting with the following message:
[MGUI ] POWER button turned off.
=====

C:\OS\LAB\LAB2>make kernel
nasm kernel.asm -o kernel.bin -f bin

```

Activate Windows  
Go to Settings to activate Windows.

```

on C:\Windows\system32\cmd.exe
C:\OS\LAB\LAB2>5
C:\OS\LAB\LAB2>..\.bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
# In bx_win32_gui.c::exit(void):
=====
Bochs is exiting with the following message:
[WGUI] POWER button turned off.
=====
C:\OS\LAB\LAB2>make kernel
nasm kernel.asm -o kernel.bin -f bin
C:\OS\LAB\LAB2>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

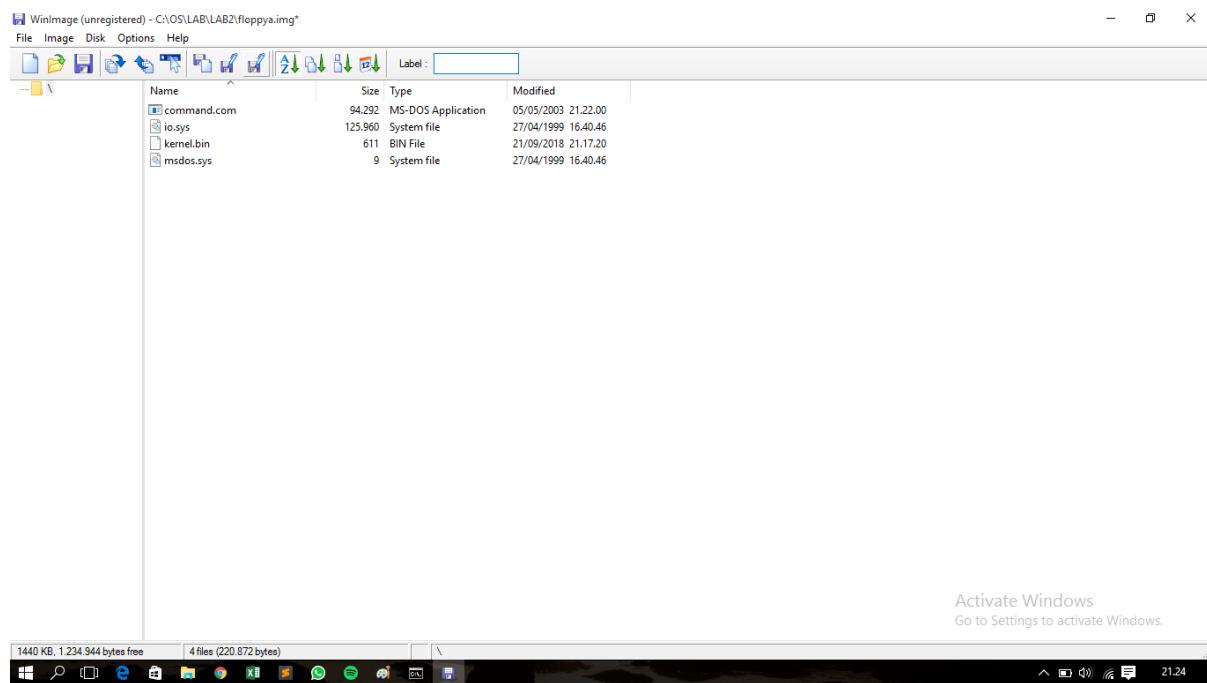
Directory of C:\OS\LAB\LAB2

21/09/2018 20:54 <DIR> .
21/09/2018 20:54 <DIR> ..
21/09/2018 21:17 10.153 bochs.log
15/12/2008 23:18 1.625 bochsrc.bxrc
21/09/2018 21:16 15.921 boot.asm
21/09/2018 21:16 512 boot.bin
16/09/2007 23:23 18.432 bximage.exe
27/02/2007 03:50 342.016 dd.exe
15/12/2008 20:52 78 dosfp.bat
21/09/2018 21:16 1.474.560 floppya.img
19/09/2018 12:09 7.066 kernel.asm
21/09/2018 21:17 611 kernel.bin
15/12/2008 23:21 44 s.bat
15/12/2008 19:20 1.872.146 bytes
12 File(s) 1.872.146 bytes
2 Dir(s) 87.871.979.520 bytes free
C:\OS\LAB\LAB2>

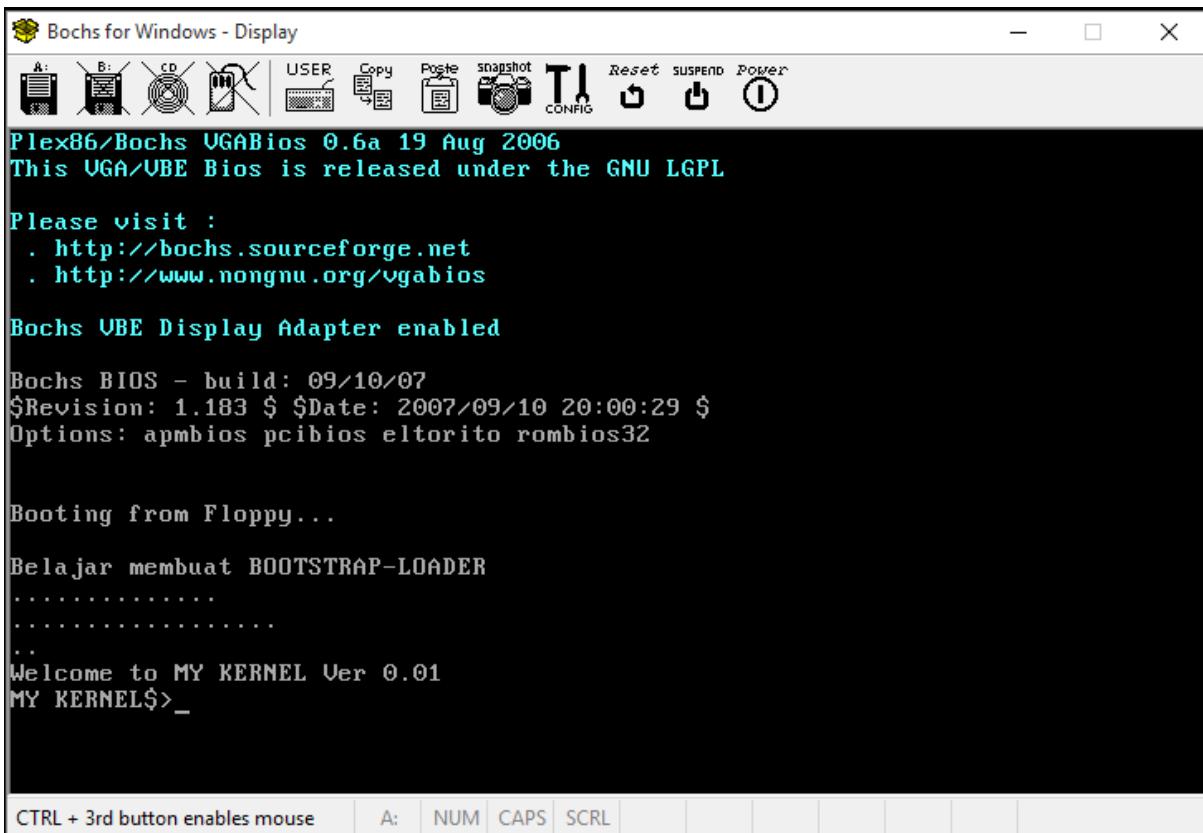
```

Activate Windows  
Go to Settings to activate Windows.

## 9. Memasukkan file kernel.bin ke dalam file floppya.img



## 10. Cek dengan "S"



## 11. Modifikasi file kernel.asm. Ganti strWelcomeMsg sesuai perintah.

```
C:\Windows\System32\cmd.exe
C:\OS\LAB\LAB2>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\OS\LAB\LAB2

21/09/2018 20:54 <DIR> .
21/09/2018 20:54 <DIR> ..
21/09/2018 21.17 10.153 bochs.log
15/12/2008 23.18 1.625 bochsrc.bxrc
21/09/2018 21.16 15.921 boot.asm
21/09/2018 21.16 512 boot.bin
16/09/2007 23.22 18.432 bximage.exe
27/02/2007 03.50 342.016 dd.exe
15/12/2008 20.52 78 dosfp.bat
21/09/2018 21.16 1.474.560 floppya.img
19/09/2018 12.09 7.966 kernel.asm
21/09/2018 21.17 611 kernel.bin
15/12/2008 23.21 228 Makefile
15/12/2008 19.20 44 s.bat
12 File(s) 1.872.146 bytes
2 Dir(s) 87.871.979.520 bytes free

C:\OS\LAB\LAB2>s
C:\OS\LAB\LAB2>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing Win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
# In bx_w32_gui.c::exit(void)

Bochs is exiting with the following message:
[MSUI] POWER button turned off.
=====

C:\OS\LAB\LAB2>notepad kernel.asm
C:\OS\LAB\LAB2>
```

kernel.asm - Notepad

```
_display_end1:
    mov ah, 0x0E ; aksi ganti baris (akhir baris) dari BIOS teletype!
    mov al, 0x0D
    mov bh, 0x00
    mov bl, 0x07
    int 0x10
    mov ah, 0x0E ; aksi mulai dari baris baru dari BIOS teletype!
    mov al, 0x0A
    mov bh, 0x00
    mov bl, 0x07
    int 0x10
    ret

_display_prompt:
    mov si, strPrompt
    mov al, 0x01
    int 0x21
    ret

[SEGMENT .data]
strWelcomeMsg db "Belajar membuat kernel", 0x00
strPrompt db "MY KERNEL$>", 0x00
cmdMaxLen db 255 ; maksimum COMMAND
strOsName db "MY KERNEL", 0x00 ; OS details
strMajorVer db "0", 0x00
strMinorVer db ".03", 0x00
cmdVer db "ver", 0x00 ; COMMAND internal
cmdExit db "exit", 0x00
txtVersion db "version", 0x00
```

## 11. Kemudia make kernel kembali untuk merefresh.

```
C:\Windows\system32\cmd.exe
Volume Serial Number is 4A6B-68E6
Directory of C:\OS\LAB\LAB2

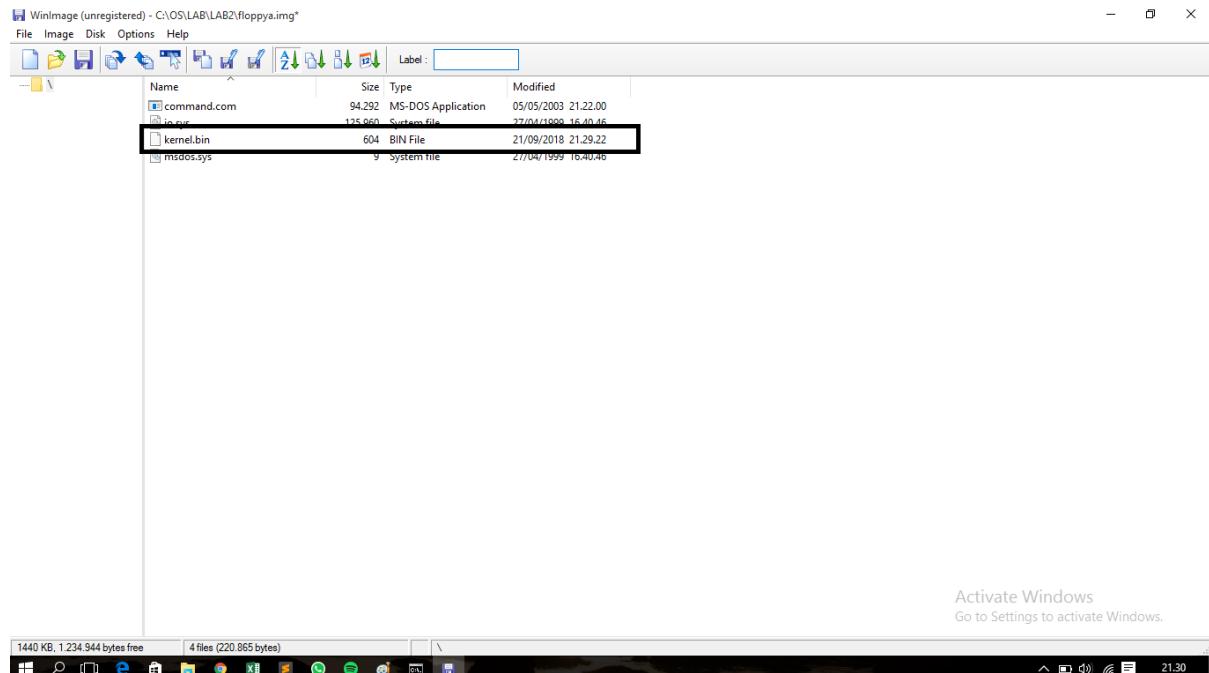
21/09/2018 20:54 <DIR> .
21/09/2018 20:54 <DIR> ..
21/09/2018 21:17 10.153 bochs.log
15/12/2008 23:18 1.625 bochsrc.bxrc
21/09/2018 21:16 15.921 boot.asm
21/09/2018 21:16 512 boot.bin
16/09/2007 23:22 18.432 bximage.exe
27/02/2007 03:50 342.016 dd.exe
15/12/2008 20:52 78 dosrp.bat
21/09/2018 21:16 1.474.568 floppya.img
19/09/2018 12:09 7.966 kernel.asm
21/09/2018 21:17 611 kernel.bin
15/12/2008 23:21 228 Makefile
15/12/2008 19:20 44 s.bat
               12 File(s)   1.872.146 bytes
               2 Dir(s)  87.871.979.520 bytes free

C:\OS\LAB\LAB2>s
C:\OS\LAB\LAB2>..\..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
-----
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
-----
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log!
# In bx_win32_gui.c::exit(void)!
-----
Bochs is exiting with the following message:
[WGU ] POWER button turned off.
-----
C:\OS\LAB\LAB2>notepad kernel.asm
C:\OS\LAB\LAB2>make kernel
nasm kernel.asm -o kernel.bin -f bin
C:\OS\LAB\LAB2>

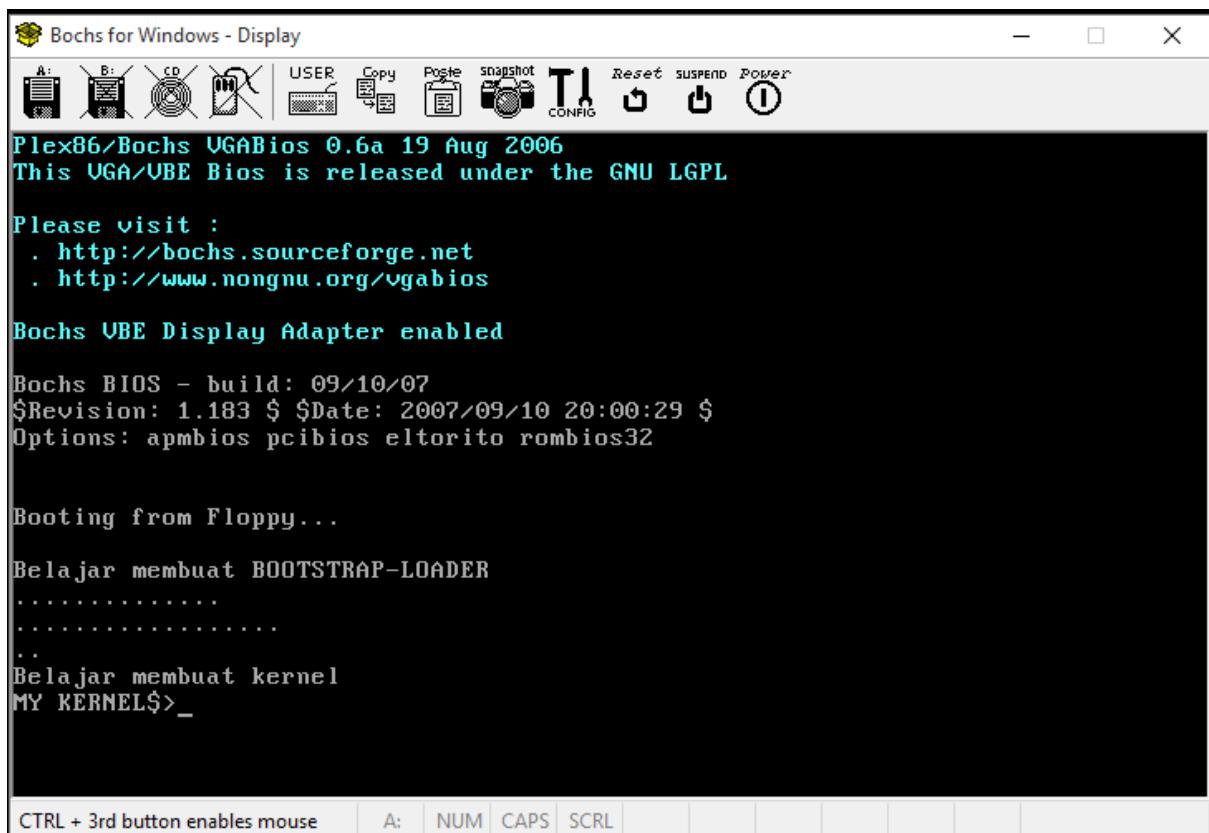
```

Activate Windows  
Go to Settings to activate Windows.

## 12. Dan masukkan kembali kernel yang telah diperbarui.



13. Kemudian cek dengan mengetikkan “S”



The screenshot shows a terminal window titled "Bochs for Windows - Display". The window contains the following text:

```
Plex86/Bochs Vgabios 0.6a 19 Aug 2006
This Vga/Vbe Bios is released under the GNU LGPL

Please visit :
. http://bochs.sourceforge.net
. http://www.nongnu.org/vgabios

Bochs VBE Display Adapter enabled

Bochs BIOS - build: 09/10/07
$Revision: 1.183 $ $Date: 2007/09/10 20:00:29 $
Options: apmbios pcibios eltorito rombios32

Booting from Floppy...

Belajar membuat BOOTSTRAP-LOADER
.....
...
Belajar membuat kernel
MY KERNEL$>_
```

At the bottom of the window, there is a status bar with the text "CTRL + 3rd button enables mouse" and several control buttons labeled A:, NUM, CAPS, SCRL.

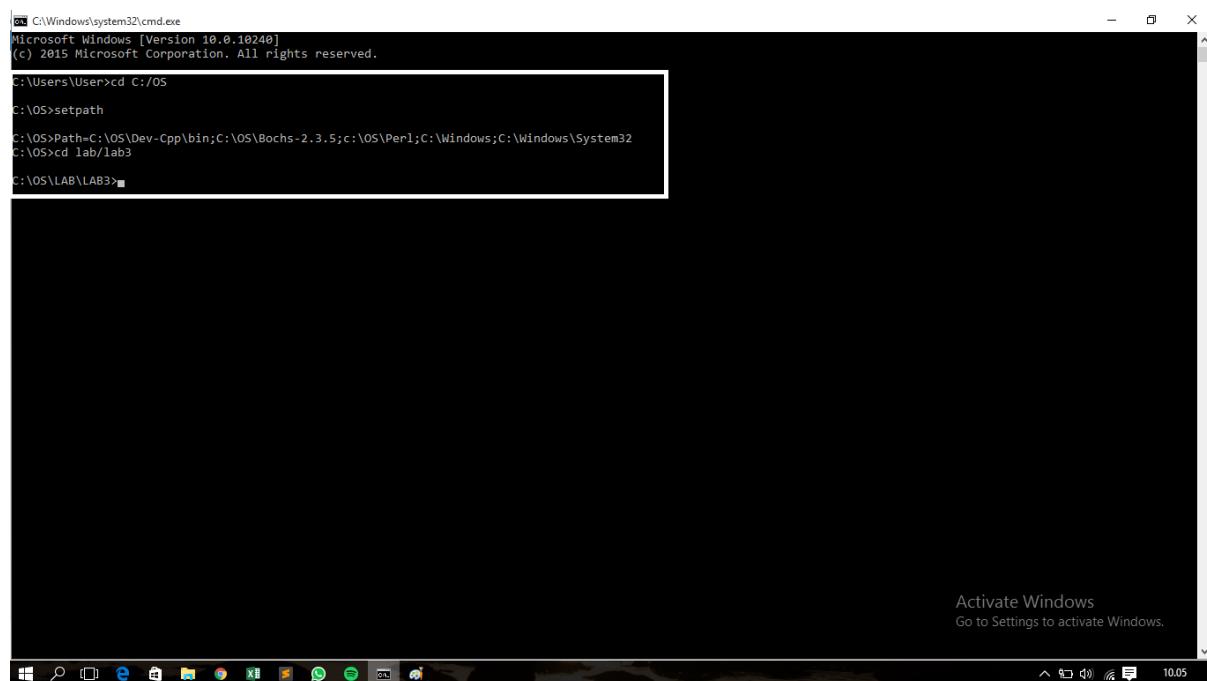
### **Praktikum 3**

Nama : M. Khoiruddin

NIM : L200170104

Kelas : E

1. Masuk ke direktori C:/OS, lakukan setpath dan masuk ke direktori lab/lab3



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:/OS
C:\OS>setpath
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
C:\OS>cd lab/lab3
C:\OS\LAB\LAB3>
```

The screenshot shows a Windows Command Prompt window. The command history at the top includes the path to cmd.exe, the copyright notice, and the user's current directory (C:\Users\User). The user then types 'cd C:/OS' to change the directory to C:\OS. Next, they type 'setpath' followed by a custom path definition: 'Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32'. Finally, the user types 'cd lab/lab3' to navigate to the specific subdirectory within the OS folder. The prompt then changes to 'C:\OS\LAB\LAB3>'. In the bottom right corner of the window, there is a watermark that says 'Activate Windows Go to Settings to activate Windows.' The taskbar at the bottom of the screen shows various pinned icons.

2. ketikkan type s.bat

```
on C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:/OS
C:\OS>setpath
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
C:\OS>cd lab/Lab3
C:\OS\LAB\LAB3>type s.bat
..\..\bochs-2.3.5\bochsrcdbg -q -f bochsrc.bxrc
C:\OS\LAB\LAB3>

Activate Windows
Go to Settings to activate Windows.

Windows taskbar icons
```

#### 4. Lakukan debugging dengan cara ketik ‘S’

```
on Bochs for Windows - Console
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:/OS
C:\OS>setpath
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
C:\OS>cd lab/Lab3
C:\OS\LAB\LAB3>type s.bat
..\..\bochs-2.3.5\bochsrcdbg -q -f bochsrc.bxrc
C:\OS\LAB\LAB3>s

Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
Next at t=0
(0) [0xfffffffff0] f000:fff0 (unk. ctxt): jmp far f000:e05b      ; ea5be000f0
<bochs:1>

Bochs for Windows - Display
```

Bochs for Windows - Display window showing the Bochs graphical interface.

```
Activate Windows
Go to Settings to activate Windows.

Windows taskbar icons
```

#### 5. Ketikkan ‘r’ untuk melihat isi register CS dan IP.

Bochs for Windows - Console

```

Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>cd C:/OS
C:\OS>setpath
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32;C:\OS>cd lab/lab3
C:\OS\LAB\LAB3>type s.bat
..\\.\bochs-2.3.5\bochsrcdbg -q -f bochsrc.bxrc
C:\OS\LAB\LAB3>s

C:\OS\LAB\LAB3>..\..\bochs-2.3.5\bochsrcdbg -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
Next at t=0
(0) [0xfffffff0] f000:fff0 (unk. ctxt): jmp far f000:e05b ; ea5be000f0
<bochs:>r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:00000f20 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000ffff
eflags: 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:>2>
```

Bochs for Windows - Display

CTRL + 3rd button enables mouse

Activate Windows  
Go to Settings to activate Windows.

## 6. Ketikkan ‘s’

Bochs for Windows - Console

```

C:\OS\LAB\LAB3>type s.bat
..\\.\bochs-2.3.5\bochsrcdbg -q -f bochsrc.bxrc
C:\OS\LAB\LAB3>s

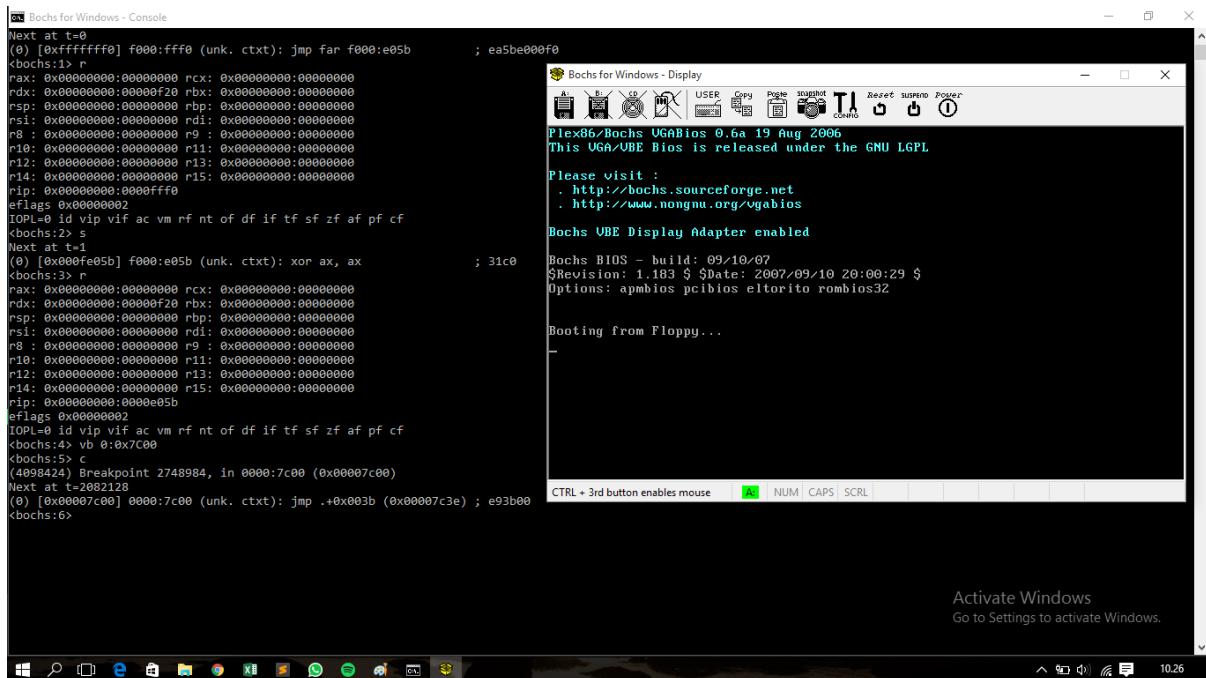
C:\OS\LAB\LAB3>..\..\bochs-2.3.5\bochsrcdbg -q -f bochsrc.bxrc
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
Next at t=0
(0) [0xfffffff0] f000:fff0 (unk. ctxt): jmp far f000:e05b ; ea5be000f0
<bochs:>r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:00000f20 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000ffff
eflags: 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:>2>s
Next at t=1
(0) [0x000fe05b] f000:e05b (unk. ctxt): xor ax, ax ; 31c0
<bochs:>r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:00000f20 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000e05b
eflags: 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:>4>
```

Bochs for Windows - Display

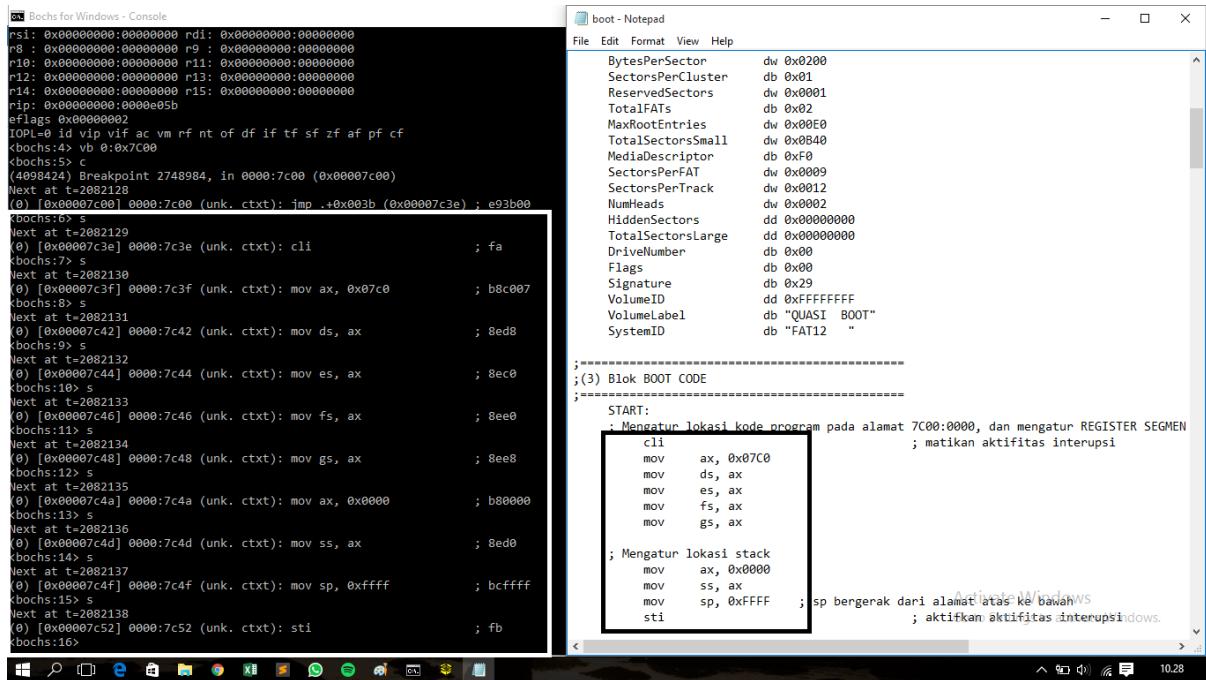
CTRL + 3rd button enables mouse

Activate Windows  
Go to Settings to activate Windows.

## 7. Kemudian masukkan perintah ‘vb 0:0x7C00’ untuk membuat pemberhentian di alamat tersebut.



8. Ketikkan ‘c’ untuk continue / melanjutkan. Lalu ketikkan ‘s’ berulang sebanyak 10 kali, dan lakukan pengecekan dengan file boot.asm



9. Ketikkan ‘q’ untuk menghentikan debugging. Kemudian lakukan debugging lagi dengan cara ketikkan ‘s’, kemudian ketikkan ‘vb 0x0100:0x0000’ untuk menghentikan langkah saat PC mulai mengeksekusi instruksi dari program ‘kernel.bin’, lalu ketikkan ‘c’

The screenshot shows two windows. On the left is the 'Bochs for Windows - Console' window, which displays assembly code and memory dump output. On the right is the 'Bochs for Windows - Display' window, showing a graphical user interface with icons for floppy disk, CD/DVD, and other system components. A status bar at the bottom of the screen shows 'Activate Windows Go to Settings to activate Windows.'

```

Bochs:1> s
Next at t=2082134
(0) [0xb00007c48] 0000:7c48 (unk. ctxt): mov gs, ax ; b8e8
<bochs:1> s
Next at t=2082135
(0) [0xb00007c49] 0000:7c49 (unk. ctxt): mov ax, 0x0000 ; b80000
<bochs:1> s
Next at t=2082136
(0) [0xb00007c4d] 0000:7c4d (unk. ctxt): mov ss, ax ; 8ed0
<bochs:1> s
Next at t=2082137
(0) [0xb00007c4f] 0000:7c4f (unk. ctxt): mov sp, 0xffff ; bcffff
<bochs:1> s
Next at t=2082138
(0) [0xb00007c52] 0000:7c52 (unk. ctxt): sti ; fb
<bochs:1> q
# In bx_wins2_gui_c::exit(void)!

Bochs is exiting. Press ENTER when you're ready to close this window.

C:\OS\LAB\LAB3>
'h' is not recognized as an internal or external command,
operable program or batch file.

C:\OS\LAB\LAB3>

C:\OS\LAB\LAB3>..\bochs-2.3.5\bochsdbg -q -f bochsrc.bxrc
00000000001[APIC?]
----- Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
-----
00000000001[ ] reading configuration from bochsrc.bxrc
00000000001[ ] installing win32 module as the Bochs GUI
00000000001[ ] using log file bochs.log
Next at t=0
(0) [0xffffffff] f000:fff0 (unk. ctxt): jmp far f000:e05b ; ea5be000f0
<bochs:1> vb 0x0100:0x0000
<bochs:2> c
(9537920) Breakpoint 2748984, in 0100:0000 (0x00001000)
Next at t=2945013
(0) [0x00001003] 0100:0000 (unk. ctxt): mov ax, 0x0100 ; b80001
<bochs:3>

```

10. Kemudian ketikkan ‘s’ minimal 10x. Lalu bandingkan hasilnya dengan isi file kernel.asm.

The screenshot shows two windows. On the left is the 'Bochs x86 Emulator 2.3.5' console window, showing assembly code and memory dump output. On the right is a 'kernel - Notepad' window displaying the assembly code of the kernel. A status bar at the bottom of the screen shows 'Activate Windows Go to Settings to activate Windows.'

```

Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
-----
00000000001[ ] reading configuration from bochsrc.bxrc
00000000001[ ] installing win32 module as the Bochs GUI
00000000001[ ] using log file bochs.log
Next at t=0
(0) [0xffffffff] f000:fff0 (unk. ctxt): jmp far f000:e05b ; ea5be000f0
<bochs:1> s
Next at t=2945014
(0) [0x00001003] 0100:0003 (unk. ctxt): mov ds, ax ; 8ed8
<bochs:4> s
Next at t=2945015
(0) [0x00001005] 0100:0005 (unk. ctxt): mov es, ax ; 8ec0
<bochs:5> s
Next at t=2945016
(0) [0x00001007] 0100:0007 (unk. ctxt): cli ; fa
<bochs:6> s
Next at t=2945017
(0) [0x00001008] 0100:0008 (unk. ctxt): mov ss, ax ; 8ed0
<bochs:7> s
Next at t=2945018
(0) [0x0000100a] 0100:000a (unk. ctxt): mov sp, 0xffff ; bcffff
<bochs:8> s
Next at t=2945019
(0) [0x0000100d] 0100:000d (unk. ctxt): sti ; fb
<bochs:9> c
Next at t=2945020
(0) [0x0000100e] 0100:000e (unk. ctxt): push dx ; 52
<bochs:10> s
Next at t=2945021
(0) [0x0000100f] 0100:000f (unk. ctxt): push es ; 06
<bochs:11> s
Next at t=2945022
(0) [0x00001010] 0100:0010 (unk. ctxt): xor ax, ax ; 31c0
<bochs:12> s
Next at t=2945023
(0) [0x00001012] 0100:0012 (unk. ctxt): mov es, ax ; b8c0
<bochs:13>

```

The Notepad window contains the following assembly code:

```

; Prototype SIMPLE KERNEL ver 0.01
; LAB-INFORMATIKA
; =====
[org 0x000]
[bits 16]

[SEGMENT .text]

;START (0) [0x00001000] 0100:0000 (unk. ctxt): mov ax, 0x0100 ;Lokasi memori untuk menempatkan kernel
        mov ax, 0x0100
        mov ds, ax
        mov es, ax

        cli
        mov ss, ax
        mov sp, 0xFFFF
        sti

        push dx
        push es
        xor ax, ax
        mov es, ax

        cli
        mov word [es:0x21*4], _int0x21 ; setup interrupt service
        mov [es:0x21*4+2], cs ; untuk menampilkan karakter di layar
        sti
        pop es
        pop dx

        mov si, strWelcomeMsg ; Tampilkan informasi proses
        mov al, 0x01 ; request service 0x01
        int 0x21 ; int 0x21

        call _shell ; call the shell

```

# TUGAS!

## 1. Tabel pemetaan memori pada PC

No.	Blok Memori	Alokasi Pemakaian
1	F 0 0 0 0	ROM BIOS, Diagnostic, BASIC
2	E 0 0 0 0	ROM program
3	D 0 0 0 0	ROM program
4	C 0 0 0 0	Perluasan BIOS untuk hardisk XT
5	B 0 0 0 0	Monokrom Monitor
6	A 0 0 0 0	Monitor EGA, VGS, dll
7	9 0 0 0 0	Daerah kerja pemakai s/d 640 KB
8	8 0 0 0 0	Daerah kerja pemakai s/d 576 KB
9	7 0 0 0 0	Daerah kerja pemakai s/d 512 KB
10	6 0 0 0 0	Daerah kerja pemakai s/d 448 KB
11	5 0 0 0 0	Daerah kerja pemakai s/d 384 KB
12	4 0 0 0 0	Daerah kerja pemakai s/d 320 KB
13	3 0 0 0 0	Daerah kerja pemakai s/d 256 KB
14	2 0 0 0 0	Daerah kerja pemakai s/d 192 KB
15	1 0 0 0 0	Daerah kerja pemakai s/d 128 KB
16	0 0 0 0 0	Daerah kerja pemakai s/d 64 KB

## 2. Perbedaan mode kerja “Real Mode” dan “Protected Mode”

- Real Mode:** Real-Mode adalah sebuah modus di mana prosesor Intel x86 berjalan seolah-olah dirinya adalah sebuah prosesor Intel 8085 atau Intel 8088, meski ia merupakan prosesor Intel 80286 atau lebih tinggi. Karenanya, modus ini juga disebut sebagai modus 8086 (8086 Mode). Dalam modus ini, prosesor hanya dapat mengeksekusi instruksi 16-bit saja dengan menggunakan register internal yang berukuran 16-bit, serta hanya dapat mengakses hanya 1024 KB dari memori karena hanya menggunakan 20-bit jalur bus alamat. Semua program DOS berjalan pada modus ini.
- Protected Mode:** Modus terproteksi (protected mode) adalah sebuah modus di mana terdapat proteksi ruang alamat memori yang ditawarkan oleh mikroprosesor untuk digunakan oleh sistem operasi. Modus ini datang dengan mikroprosesor Intel 80286 atau yang lebih tinggi. Karena memiliki proteksi ruang alamat memori, maka dalam modus ini sistem operasi dapat melakukan multitasking.

#### **Praktikum 4**

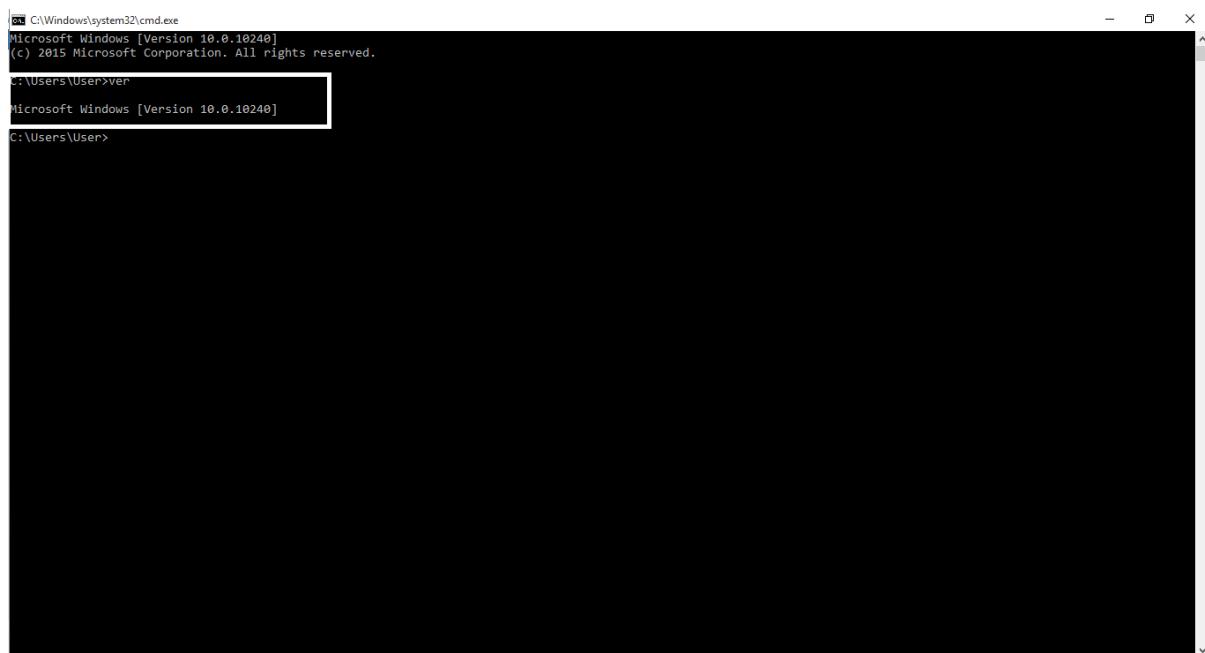
Nama : Muhammad Khoiruddin

NIM : L200170104

Kelas : E

#### **Percobaan Pertama: Melihat versi MS-DOS**

1. Mengetikkan ver.



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\User>ver
Microsoft Windows [Version 10.0.10240]
C:\Users\User>
```

#### **Percobaan Kedua: Melihat, masuk, keluar dari direktori**

1. Melihat isi direktori dengan mengetikkan dir.

```
C:\Windows\system32\cmd.exe
C:\Users\User>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\users\user

05/10/2018 22.39 <DIR> .
05/10/2018 22.39 <DIR> ..
07/07/2018 18.28 187 .gitconfig
14/09/2018 05.19 <DIR> .gnome2
14/09/2018 05.20 1.171 .gvrngrc
16/09/2018 21.40 <DIR> .nbi
16/09/2018 21.25 <DIR> .oracle_jre_usage
18/09/2018 16.27 218 .recently-used.xbel
27/09/2018 17.05 .VirtualBox
11/10/2016 11.23 <DIR> Contacts
20/09/2018 15.51 <DIR> Desktop
09/10/2018 12.12 <DIR> Documents
09/10/2018 06.54 <DIR> Downloads
11/10/2016 11.38 <DIR> Favorites
28/03/2018 21.27 <DIR> greenfoot
14/09/2018 08.19 <DIR> GVR
08/10/2018 10.30 339 gvr_stderr.log
08/10/2018 11.39 805 gvr_stdout.log
27/07/2017 13.25 <DIR> Intel
11/10/2016 11.23 <DIR> Links
28/08/2018 10.31 <DIR> Music
23/09/2018 21.22 <DIR> OneDrive
24/08/2018 19.59 <DIR> Pictures
11/10/2016 11.23 <DIR> Saved Games
11/10/2016 11.25 <DIR> Searches
09/10/2018 06.33 <DIR> Videos
26/09/2018 15.06 <DIR> VirtualBox VMs
      5 File(s) 2.720 bytes
     22 Dir(s) 86.745.776.128 bytes free

C:\Users\User>
```

## 2. Keluar dari direktori dengan mengetikkan cd.. hingga sampai ke direktori C:

```
C:\Windows\system32\cmd.exe
C:\Users\User>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\users\user

05/10/2018 22.39 <DIR> .
05/10/2018 22.39 <DIR> ..
07/07/2018 18.28 187 .gitconfig
14/09/2018 05.19 <DIR> .gnome2
14/09/2018 05.20 1.171 .gvrngrc
16/09/2018 21.40 <DIR> .nbi
16/09/2018 21.25 <DIR> .oracle_jre_usage
18/09/2018 16.27 218 .recently-used.xbel
27/09/2018 17.05 <DIR> .VirtualBox
11/10/2016 11.23 <DIR> Contacts
20/09/2018 15.51 <DIR> Desktop
09/10/2018 12.12 <DIR> Documents
09/10/2018 06.54 <DIR> Downloads
11/10/2016 11.38 <DIR> Favorites
28/03/2018 21.27 <DIR> greenfoot
14/09/2018 08.19 <DIR> GVR
08/10/2018 10.30 339 gvr_stderr.log
08/10/2018 11.39 805 gvr_stdout.log
27/07/2017 13.25 <DIR> Intel
11/10/2016 11.23 <DIR> Links
28/08/2018 10.31 <DIR> Music
23/09/2018 21.22 <DIR> OneDrive
24/08/2018 19.59 <DIR> Pictures
11/10/2016 11.23 <DIR> Saved Games
11/10/2016 11.25 <DIR> Searches
09/10/2018 06.33 <DIR> Videos
26/09/2018 15.06 <DIR> VirtualBox VMs
      5 File(s) 2.720 bytes
     22 Dir(s) 86.745.776.128 bytes free

C:\Users\User>cd..
C:\>
```

## 3. Melihat isi direktori C: dengan mengetikkan dir

```
on C:\Windows\system32\cmd.exe
11/10/2016 11.23 <DIR> Contacts
20/09/2018 15.51 <DIR> Desktop
09/10/2018 12.12 <DIR> Documents
09/10/2018 06.54 <DIR> Downloads
11/10/2016 11.38 <DIR> Favorites
28/03/2018 21.27 <DIR> greenfoot
14/09/2018 08.19 <DIR>
08/10/2018 10.30 339 gvr_stderr.log
08/10/2018 11.39 805 gvr_stdout.log
27/07/2017 13.25 <DIR> Intel
11/10/2016 11.23 <DIR> Links
28/08/2018 10.31 <DIR> Music
23/09/2018 21.22 <DIR> OneDrive
24/08/2018 19.59 <DIR> Pictures
11/10/2016 11.23 <DIR> Saved Games
11/10/2016 11.25 <DIR> Searches
09/10/2018 06.33 <DIR> Videos
26/09/2018 15.06 <DIR> VirtualBox VMs
      5 File(s) 2.720 bytes
     22 Dir(s) 86.745.776.128 bytes free

C:\Users\User>cd..
C:\Users>cd..

C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

27/07/2017 13.26 <DIR> Intel
14/09/2018 06.09 <DIR> OS
10/07/2015 18.04 <DIR> PerfLogs
26/09/2018 15.01 <DIR> Program Files
14/09/2018 05.19 <DIR> Program Files (x86)
11/10/2016 11.40 <DIR> Transtool
11/10/2016 11.42 <DIR> Users
09/10/2018 07.20 <DIR> Windows
22/03/2018 21.34 <DIR> xampp
      0 File(s) 0 bytes
     9 Dir(s) 86.747.389.952 bytes free

C:\>
```

#### 4. Ketikkan dir/p untuk menampilkan nama file perhalaman

```
on C:\Windows\system32\cmd.exe
      5 File(s) 2.720 bytes
     22 Dir(s) 86.745.776.128 bytes free

C:\Users\User>cd..
C:\Users>cd..

C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

27/07/2017 13.26 <DIR> Intel
14/09/2018 06.09 <DIR> OS
10/07/2015 18.04 <DIR> PerfLogs
26/09/2018 15.01 <DIR> Program Files
14/09/2018 05.19 <DIR> Program Files (x86)
11/10/2016 11.40 <DIR> Transtool
11/10/2016 11.42 <DIR> Users
09/10/2018 07.20 <DIR> Windows
22/03/2018 21.34 <DIR> xampp
      0 File(s) 0 bytes
     9 Dir(s) 86.747.389.952 bytes free

C:\>dir/p
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

27/07/2017 13.26 <DIR> Intel
14/09/2018 06.09 <DIR> OS
10/07/2015 18.04 <DIR> PerfLogs
26/09/2018 15.01 <DIR> Program Files
14/09/2018 05.19 <DIR> Program Files (x86)
11/10/2016 11.40 <DIR> Transtool
11/10/2016 11.42 <DIR> Users
09/10/2018 07.20 <DIR> Windows
22/03/2018 21.34 <DIR> xampp
      0 File(s) 0 bytes
     9 Dir(s) 86.746.161.152 bytes free

C:\>
```

#### 5. Ketikkan dir/w untuk menampilkan file secara mendatar.

```
cmd C:\Windows\system32\cmd.exe
10/07/2015 18.04 <DIR> PerfLogs
26/09/2018 15.01 <DIR> Program Files
14/09/2018 05.19 <DIR> Program Files (x86)
11/10/2016 11.40 <DIR> Transtool
11/10/2016 11.42 <DIR> Users
09/10/2018 07.20 <DIR> Windows
22/03/2018 21.34 <DIR> xampp
    0 File(s)      0 bytes
    9 Dir(s)  86.747.389.952 bytes free

C:\>dir/p
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

27/07/2017 13.26 <DIR> Intel
14/09/2018 06.00 <DIR> OS
10/07/2015 18.04 <DIR> PerfLogs
26/09/2018 15.01 <DIR> Program Files
14/09/2018 05.19 <DIR> Program Files (x86)
11/10/2016 11.40 <DIR> Transtool
11/10/2016 11.42 <DIR> Users
09/10/2018 07.20 <DIR> Windows
22/03/2018 21.34 <DIR> xampp
    0 File(s)      0 bytes
    9 Dir(s)  86.746.161.152 bytes free

C:\>dir/w
'dir' is not recognized as an internal or external command,
operable program or batch file.

C:\>dir/w
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

[Intel] [OS] [PerfLogs] [Program Files] [Program Files (x86)] [Transtool] [Users]
[Windows] [xampp]
    0 File(s)      0 bytes
    9 Dir(s)  86.746.095.616 bytes free

C:\>
```

## 6. dir/a untuk menampilkan semua file, terutama yang terhidden

```
cmd C:\Windows\system32\cmd.exe
operable program or batch file.

C:\>dir/w
Volume In drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

[Intel] [OS] [PerfLogs] [Program Files] [Program Files (x86)] [Transtool] [Users]
[Windows] [xampp]
    0 File(s)      0 bytes
    9 Dir(s)  86.746.095.616 bytes free

C:\>dir/a
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

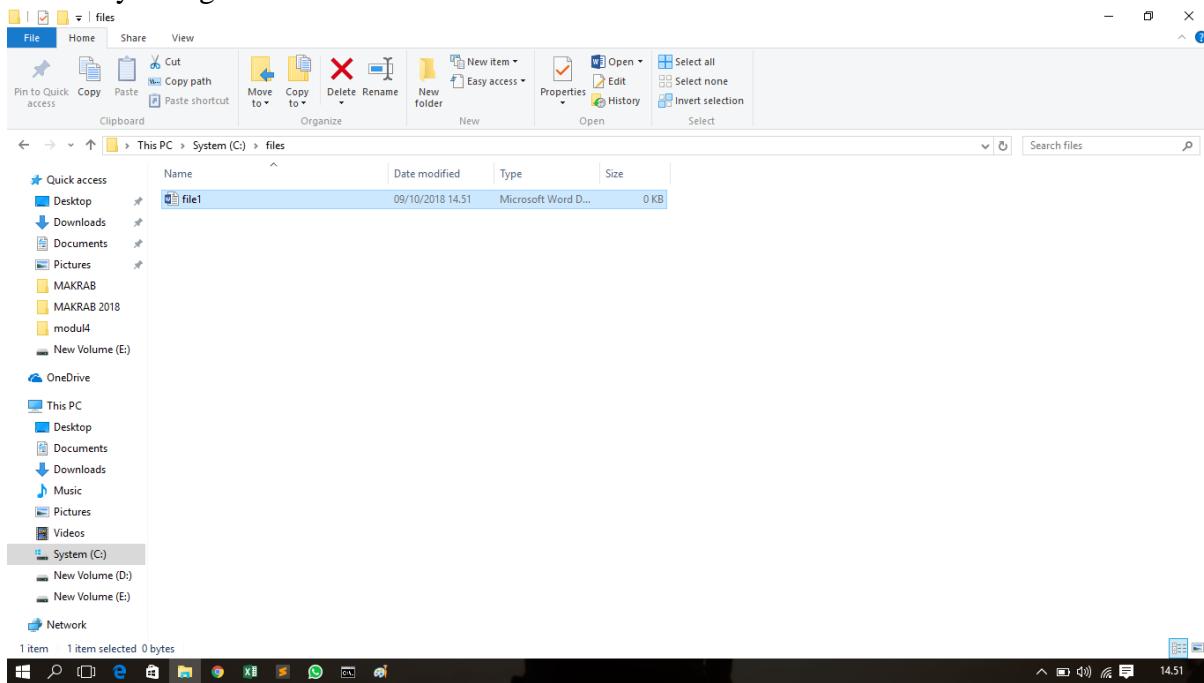
Directory of C:\

27/07/2017 13.22 <DIR> $Recycle.Bin
10/07/2015 18.00   395.268 bootmgr
10/07/2015 18.00   1 BOOTNXT
01/10/2018 14.08 <DIR> Config.Msi
10/07/2015 19.21 <JUNCTION> Documents and Settings [C:\Users]
99/10/2018 14.09   1.662.713.856 hiberfil.sys
27/07/2017 13.26 <DIR> Intel
11/10/2016 11.36 <DIR> MSOCache
14/09/2018 06.09 <DIR> OS
05/10/2018 07.41   1.006.632.960 pagefile.sys
10/07/2015 18.04 <DIR> PerfLogs
26/09/2018 15.01 <DIR> Program Files
14/09/2018 05.19 <DIR> Program Files (x86)
22/08/2018 12.50 <DIR> ProgramData
11/10/2016 11.19 <DIR> Recovery
05/10/2018 07.41   268.435.456 swapfile.sys
02/05/2018 14.58 <DIR> System Volume Information
11/10/2016 11.40 <DIR> Transtool
11/10/2016 11.42 <DIR> Users
09/10/2018 07.20 <DIR> Windows
22/03/2018 21.34 <DIR>
    5 File(s)  2.938.177.541 bytes
    16 Dir(s)  86.746.828.800 bytes free

C:\>
```

### Percobaan Ketiga: Merubah nama file

- Buat semua folder bernama files di direktori C: kemudia buat sebuah file docx di dalamnya dengan ama file1



- Lihat isi direktori, kemudia masuk ke direktori files.

```
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 14.51 <DIR>      files
27/07/2017 13.26 <DIR>      Intel
14/09/2018 06.09 <DIR>      OS
10/07/2015 18.04 <DIR>      PerfLogs
26/09/2018 15.01 <DIR>      Program Files
14/09/2018 05.19 <DIR>      Program Files (x86)
11/10/2016 11.40 <DIR>      Transtool
11/10/2016 11.42 <DIR>      Users
09/10/2018 07.20 <DIR>      Windows
22/03/2018 21.34 <DIR>      xamp
                           0 File(s)          0 bytes
                           10 Dir(s)  86.747.557.888 bytes free

C:\>cd files
C:\files>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\files

09/10/2018 14.51 <DIR>      .
09/10/2018 14.51 <DIR>      ..
09/10/2018 14.51           0 file1.docx
                           1 File(s)          0 bytes
                           2 Dir(s)  86.746.275.840 bytes free
```

- Ubah nama file dengan perintah ren nama\_file\_awal.ekstensi nama\_file\_baru.ekstensi

```
on C:\Windows\system32\cmd.exe
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 14.51 <DIR>       files
27/07/2017 13.26 <DIR>       Intel
14/09/2018 06.00 <DIR>       OS
10/07/2015 18.04 <DIR>       PerfLogs
26/09/2018 15.01 <DIR>       Program Files
14/09/2018 05.19 <DIR>       Program Files (x86)
11/10/2016 11.40 <DIR>       Transtool
11/10/2016 11.42 <DIR>       Users
09/10/2018 07.20 <DIR>       Windows
22/03/2018 21.34 <DIR>       xampp
          0 File(s)           0 bytes
          10 Dir(s)  86.747.557.888 bytes free

C:\>cd files
C:\files>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\files

09/10/2018 14.51 <DIR>       .
09/10/2018 14.51 <DIR>       ..
09/10/2018 14.51           0 file1.docx
          1 File(s)           0 bytes
          2 Dir(s)  86.746.275.840 bytes free

C:\files>ren file1.docx file.docx
C:\files>
```

#### 4. Ubah nama file dengan perintah rename nama\_file\_awal.ekstensi nama\_file\_baru.ekstensi

```
on C:\Windows\system32\cmd.exe
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 14.51 <DIR>       files
27/07/2017 13.26 <DIR>       Intel
14/09/2018 06.00 <DIR>       OS
10/07/2015 18.04 <DIR>       PerfLogs
26/09/2018 15.01 <DIR>       Program Files
14/09/2018 05.19 <DIR>       Program Files (x86)
11/10/2016 11.40 <DIR>       Transtool
11/10/2016 11.42 <DIR>       Users
09/10/2018 07.20 <DIR>       Windows
22/03/2018 21.34 <DIR>       xampp
          0 File(s)           0 bytes
          10 Dir(s)  86.747.557.888 bytes free

C:\>cd files
C:\files>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\files

09/10/2018 14.51 <DIR>       .
09/10/2018 14.51 <DIR>       ..
09/10/2018 14.51           0 file1.docx
          1 File(s)           0 bytes
          2 Dir(s)  86.746.275.840 bytes free

C:\files>ren file1.docx file.docx
C:\files>rename file.docx file2.docx
C:\files>
```

#### 5. Kemudian apakah sudah terganti dengan melihat isi direktori dengan mengetikkan dir.

```

C:\> C:\Windows\system32\cmd.exe
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\files

09/10/2018 14:51 <DIR> .
09/10/2018 14:51 <DIR> ..
09/10/2018 14:51 0 file1.docx
               1 File(s)    0 bytes
               2 Dir(s) 86.746.275.840 bytes free

C:\files>ren file1.docx file.docx
C:\files>rename file.docx file2.docx

C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

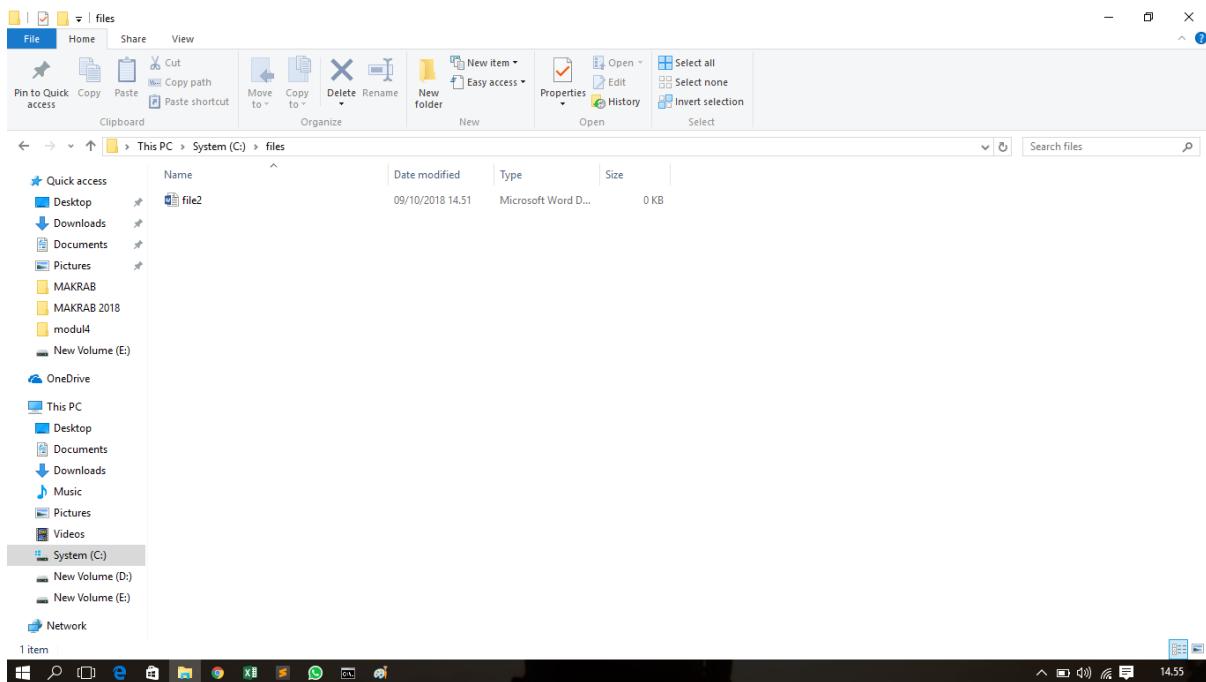
Directory of C:\files

09/10/2018 14:54 <DIR> .
09/10/2018 14:54 <DIR> ..
09/10/2018 14:51 0 file2.docx
               1 File(s)    0 bytes
               2 Dir(s) 86.746.423.296 bytes free

C:\files>

```

## 6. Kemudian pastikan apakah sudah terganti dengan melihatnya pada windows explorer.



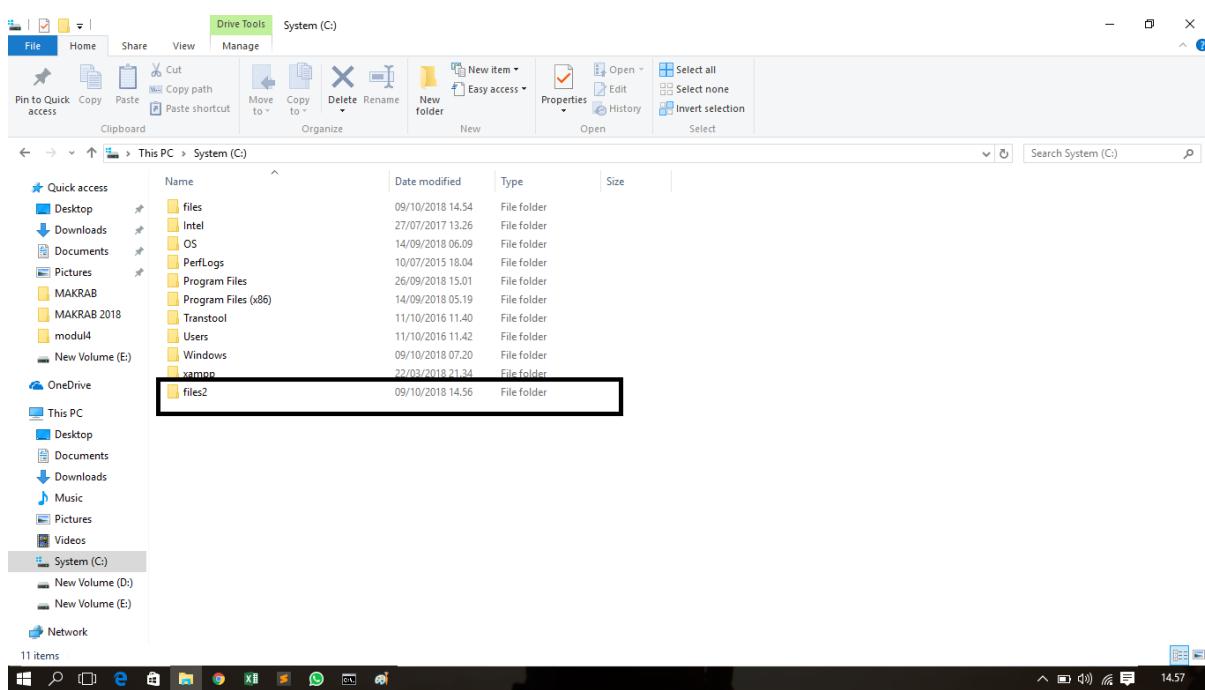
## Percobaan keempat: Copy file dan menghapus file

1. Keluar dari direktori files dengan mengetikkan cd..

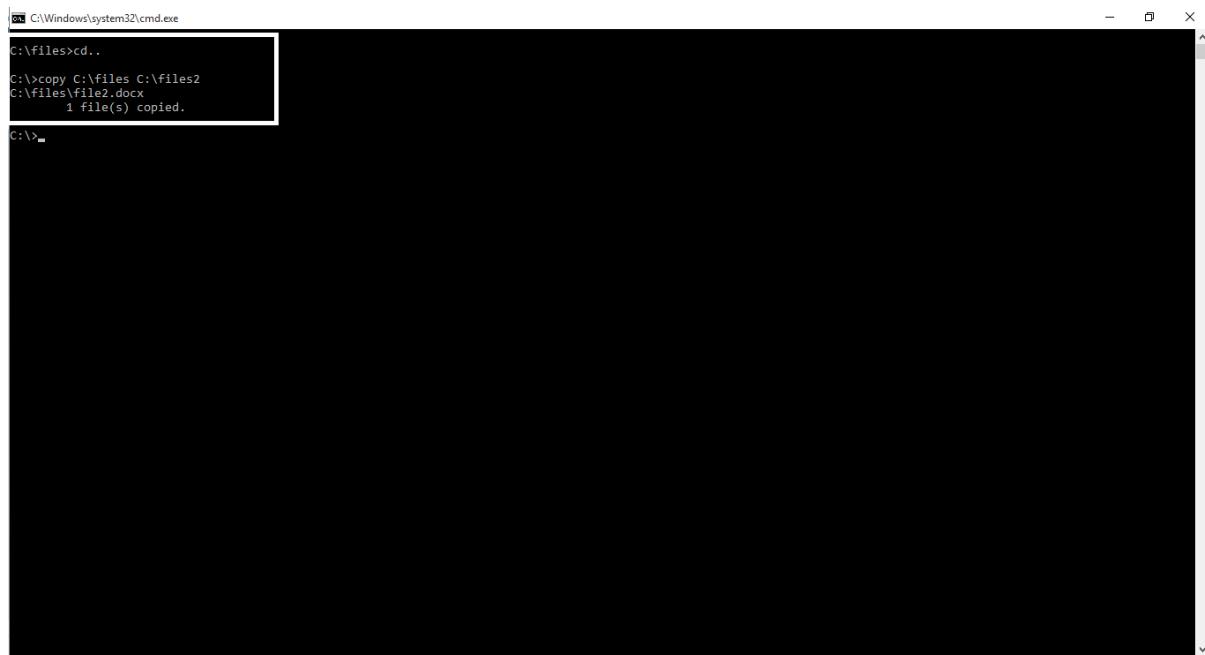


```
C:\Windows\system32\cmd.exe
C:\files>cd..
C:>
```

2. Buatlah sebuah folder baru bernama files2 di direktori C:



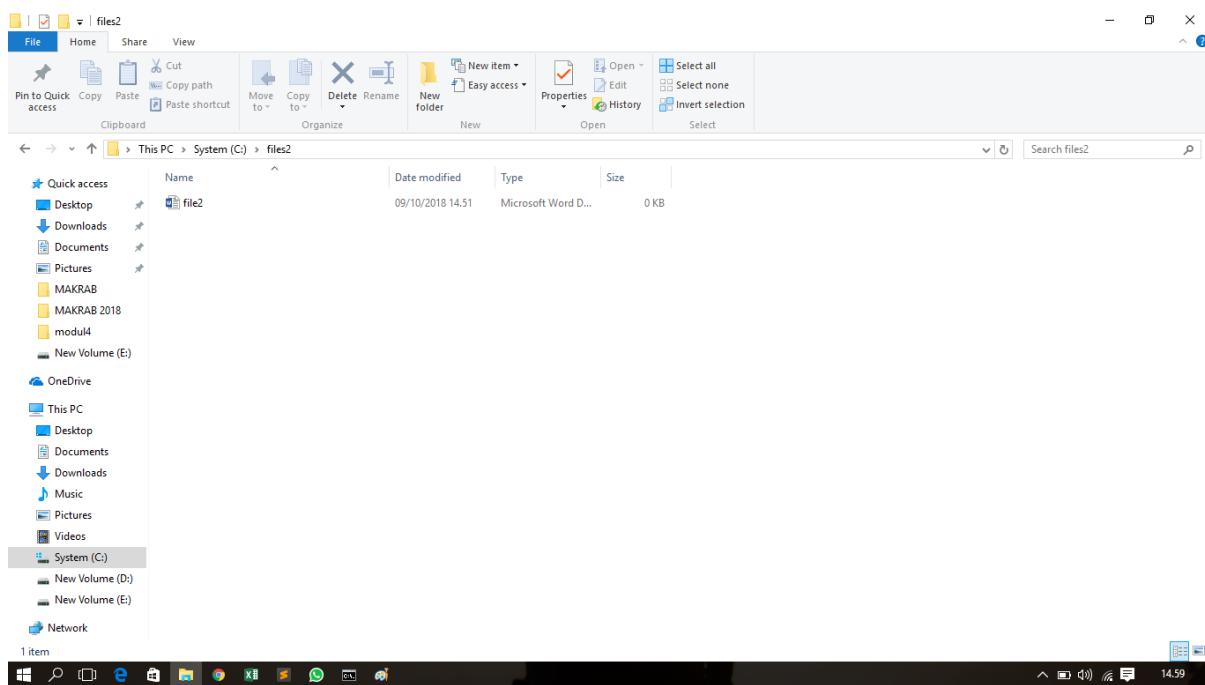
3. Menyalin semua isi file di suatu folder dengan cara mengetikkan copy direktori\nama\_folder\_awal direktori\\ nama\_folder\_tujuan



```
C:\Windows\system32\cmd.exe
C:\files>cd..
C:\>copy C:\files C:\files2
C:\files\file2.docx
    1 file(s) copied.

C:\>
```

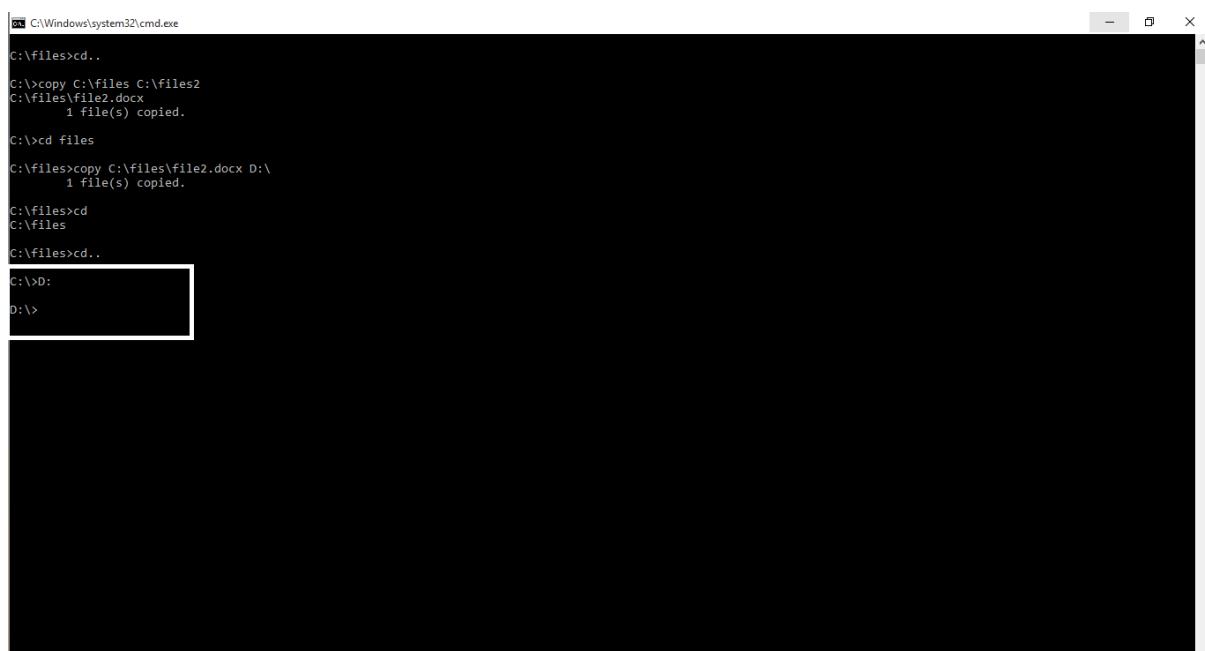
4. Cek pada windows explorer.



5. Untuk mengkopi lain direktori juga berlaku sama. Jika ingin mengecek melalui cmd dapat menggunakan dir.



```
C:\Windows\system32\cmd.exe
C:\files>cd..
C:\>copy C:\files C:\files2
C:\files\file2.docx
    1 file(s) copied.
C:\>cd files
C:\files>copy C:\files\file2.docx D:\\
    1 file(s) copied.
C:\files>
```



```
C:\Windows\system32\cmd.exe
C:\files>cd..
C:\>copy C:\files C:\files2
C:\files\file2.docx
    1 file(s) copied.
C:\>cd files
C:\files>copy C:\files\file2.docx D:\\
    1 file(s) copied.
C:\files>cd
C:\files
C:\files>cd..
C:\>D:
D:>
```

```
C:\Windows\system32\cmd.exe
C:\files>cd..
C:\>copy C:\files C:\files2
C:\files\file2.docx
  1 file(s) copied.
C:\>cd files
C:\files>copy C:\files\file2.docx D:\\
  1 file(s) copied.
C:\files>d
C:\files
C:\files>cd..
C:\>D:
D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

13/05/2018  14.39    <DIR>      ADOBE
03/10/2018  06.57    <DIR>      Aplikasi
28/04/2018  15.17    <DIR>      CETAK
16/08/2018  16.21    <DIR>      DESAINKU
25/06/2018  12.06    <DIR>      FFOutput
09/10/2018  14.51    <DIR>      0 file2.docx
09/10/2018  14.51    <DIR>      file2.docx
18/07/2018  07.44    <DIR>      FOTO
11/04/2018  11.09    <DIR>      HP
12/07/2018  26.24    <DIR>      leaves-and-wombats
16/08/2018  09.22    <DIR>      MUSIC
10/08/2018  18.22    <DIR>      TUTORIAL
18/05/2018  28.07    <DIR>      Wallpaper
31/07/2018  16.36    <DIR>      zia
               1 File(s)          0 bytes
               13 Dir(s)  400.511.463.424 bytes free

D:\>
```

## 6. Untuk mengapus ketikkan del nama\_folder

```
C:\Windows\system32\cmd.exe
28/04/2018  15.17    <DIR>      CETAK
16/08/2018  16.21    <DIR>      DESAINKU
25/06/2018  12.06    <DIR>      FFOutput
09/10/2018  14.51    <DIR>      0 file2.docx
28/08/2018  18.28    <DIR>      FILM
18/07/2018  07.44    <DIR>      FOTO
11/04/2018  11.09    <DIR>      HP
12/07/2018  26.24    <DIR>      leaves-and-wombats
16/08/2018  09.22    <DIR>      MUSIC
10/08/2018  18.22    <DIR>      TUTORIAL
18/05/2018  28.07    <DIR>      Wallpaper
31/07/2018  16.36    <DIR>      zia
               1 File(s)          0 bytes
               13 Dir(s)  400.511.463.424 bytes free

D:\>C:
C:\>cd
C:\>
C:\>del files
C:\files\*, Are you sure (Y/N)? Y

C:\>
```

7. Kemudia kembali menuju direktori yang terdapat folder dekstop. Kemudia copy semua isi folder dan pindah pada suatu folder di mana folder baru dibuat saat mengcopy. Dengan cara mengetikkan xcopy Dekstop D:nama\_folder\ /s/e

```
C:\Windows\system32\cmd.exe
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvfbcc.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvfbcc64.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvidiasmi1.pd_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvidiasmi.ex_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvifn.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvifr64.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvifropengl32.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvifropengl64.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvinfo.pb_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvinit.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvinitx.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvlddmkm.sy_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvmcumd.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvml.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvoglsim32.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvoglsim64.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvoglvs32.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvoglvs64.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvopenc132.dl_
Desktop\ES-475VGVA NEW Core I5\nVidia NVidia VGA N165-GT1\MOD01D00X60061000M\Display.Driver\nvopenc164.dl_
C:\Users\user>xcopy Desktop\baru\ /s/e
Desktop\CorelDRAW X7 17.3.lnk
Desktop\Flip PDF Professional.lnk
Desktop\Format Factory.lnk
Desktop\GitHub Desktop.lnk
Desktop\Google Chrome.lnk
Desktop\GreenFoot.lnk
Desktop\GvRng.lnk
Desktop\Internet Download Manager.lnk
Desktop\KMPlayer.lnk
Desktop\LINE.lnk
Desktop\Nero Express.lnk
Desktop\PhotoScape.lnk
Desktop\Photoshop CS4.lnk
Desktop\Spotify.lnk
Desktop\Sublime Text 3.lnk
Desktop\WhatsApp.lnk
Desktop\modul\praktikum\pbo\Program.class
Desktop\modul\praktikum\pbo\Program.java
19 File(s) copied
C:\Users\User>
```

8. Kemudian cek pada folder D.

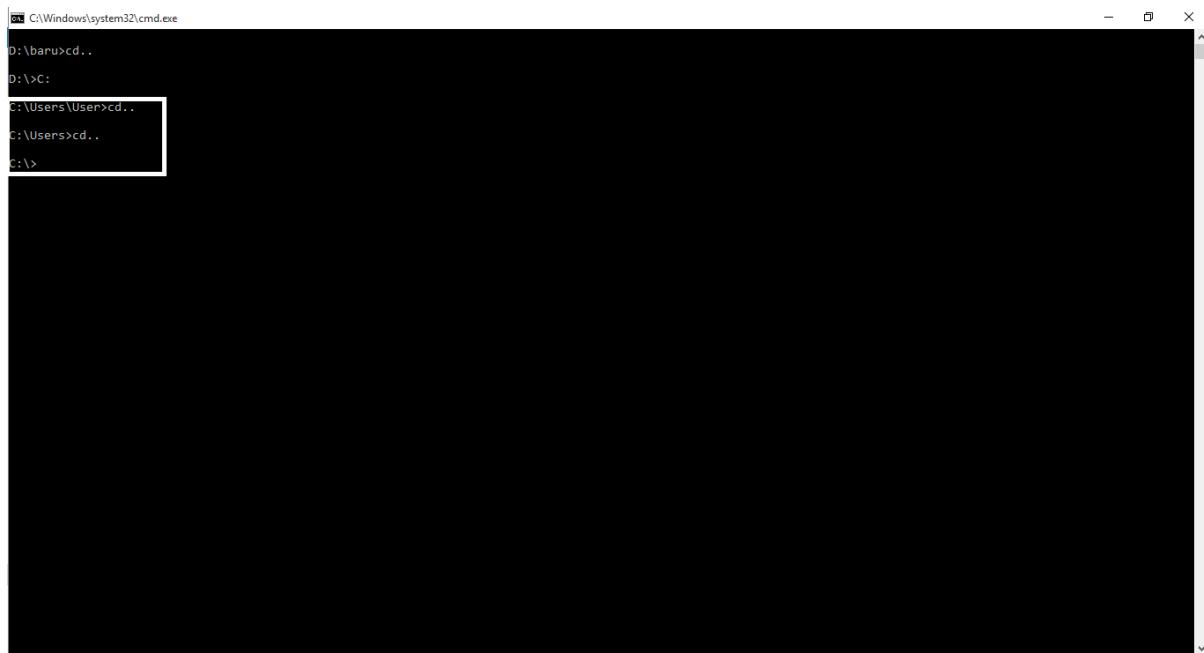
```
C:\Windows\system32\cmd.exe
Desktop\GitHub Desktop.lnk
Desktop\Google Chrome.lnk
Desktop\GreenFoot.lnk
Desktop\GvRng.lnk
Desktop\Internet Download Manager.lnk
Desktop\KMPlayer.lnk
Desktop\LINE.lnk
Desktop\Nero Express.lnk
Desktop\PhotoScape.lnk
Desktop\Photoshop CS4.lnk
Desktop\Spotify.lnk
Desktop\Sublime Text 3.lnk
Desktop\WhatsApp.lnk
Desktop\modul\praktikum\pbo\Program.class
Desktop\modul\praktikum\pbo\Program.java
19 File(s) copied
C:\Users\User>D:
D:\>dir
 Volume in drive D is New Volume
 Volume Serial Number is F4CA-991B

 Directory of D:\

13/05/2018 14.39 <DIR>      ADOBE
09/10/2018 15.15 <DIR>      Aplikasi
09/10/2018 15.26 <DIR>      baru
28/04/2018 15.17 <DIR>      CETAK
16/08/2018 18.21 <DIR>      DESAINKU
25/06/2018 12.06 <DIR>      FFOutput
09/10/2018 14.51 <DIR>      file2.docx
28/08/2018 18.28 <DIR>      FILM
18/07/2018 07.44 <DIR>      FOTO
11/04/2018 11.09 <DIR>      HP
12/07/2018 20.24 <DIR>      leaves-and-wombats
16/08/2018 09.22 <DIR>      MUSIC
10/08/2018 18.22 <DIR>      TUTORIAL
18/05/2018 20.07 <DIR>      Wallpaper
31/07/2018 16.36 <DIR>      zia
 1 File(s)          0 bytes
 14 Dir(s) 392.181.448.704 bytes free
D:\>
```

## Percobaan Kelima: Membuat dan menghapus direktori

1. Masuk ke direktori C:



```
C:\Windows\system32\cmd.exe
D:\baru>cd..
D:\>C:
C:\Users\User>cd..
C:\Users>cd..
C:\>
```

2. Buat sebuah folder baru dengan nama baru dengan cara mengetikkan md baru, kemudia lihat apakah sudah terbuat dengan melihat isi direktori C:



```
C:\Windows\system32\cmd.exe
D:\baru>cd..
D:\>C:
C:\Users\User>cd..
C:\Users>cd..
C:\>md baru
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 15:30 <DIR> baru
09/10/2018 15:05 <DIR> files
09/10/2018 14:58 <DIR> files2
27/07/2017 13:26 <DIR> Intel
14/09/2018 06:09 <DIR> OS
10/07/2015 10:04 <DIR> PerfLogs
20/09/2018 15:01 <DIR> Program Files
14/09/2018 05:19 <DIR> Program Files (x86)
11/10/2016 11:40 <DIR> Transtool
11/10/2016 11:42 <DIR> Users
09/10/2018 07:20 <DIR> Windows
22/03/2018 21:34 <DIR> xampp
               0 File(s)          0 bytes
              12 Dir(s)  91.190.657.024 bytes free

C:\>
```

3. Kemudian hapus direktori dengan rd baru, dan lihat apakah sudah terhapus.

```
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018  15.30    <DIR>      baru
09/10/2018  15.05    <DIR>      files
09/10/2018  14.58    <DIR>      files2
27/07/2017  13.26    <DIR>      Intel
14/09/2018  06.09    <DIR>      OS
10/07/2015  18.04    <DIR>      PerfLogs
26/09/2018  15.01    <DIR>      Program Files
14/09/2018  05.19    <DIR>      Program Files (x86)
11/10/2016  11.40    <DIR>      Transtool
11/10/2016  11.42    <DIR>      Users
09/10/2018  07.20    <DIR>      Windows
22/03/2018  21.34    <DIR>      xamp
               0 File(s)          0 bytes
               12 Dir(s)  91.190.652.928 bytes free

C:\>rd baru
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018  15.05    <DIR>      files
09/10/2018  14.58    <DIR>      files2
27/07/2017  13.26    <DIR>      Intel
14/09/2018  06.09    <DIR>      OS
10/07/2015  18.04    <DIR>      PerfLogs
26/09/2018  15.01    <DIR>      Program Files
14/09/2018  05.19    <DIR>      Program Files (x86)
11/10/2016  11.40    <DIR>      Transtool
11/10/2016  11.42    <DIR>      Users
09/10/2018  07.20    <DIR>      Windows
22/03/2018  21.34    <DIR>      xamp
               0 File(s)          0 bytes
               11 Dir(s)  91.190.587.392 bytes free

C:\>
```

4. Kemudian buat kembali suatu folder dengan nama baru1 dengan perintah mkdir nama\_file\_baru. Kemudian lihat apakah sudah terbuat atau belum.

```
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018  15.05    <DIR>      files
09/10/2018  14.58    <DIR>      files2
27/07/2017  13.26    <DIR>      Intel
14/09/2018  06.09    <DIR>      OS
10/07/2015  18.04    <DIR>      PerfLogs
26/09/2018  15.01    <DIR>      Program Files
14/09/2018  05.19    <DIR>      Program Files (x86)
11/10/2016  11.40    <DIR>      Transtool
11/10/2016  11.42    <DIR>      Users
09/10/2018  07.20    <DIR>      Windows
22/03/2018  21.34    <DIR>      xamp
               0 File(s)          0 bytes
               11 Dir(s)  91.190.648.832 bytes free

C:\>mkdir baru1
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018  15.32    <DIR>      baru1
               0 File(s)          0 bytes
               12 Dir(s)  91.190.648.832 bytes free

C:\>
```

5. Kemudian hapus dengan perintah rmdir nama\_folder. Dan lihat apakah sudah terhapus.

```

C:\> C:\Windows\system32\cmd.exe
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 15.32 <DIR>      baru1
09/10/2018 15.05 <DIR>      files
09/10/2018 14.58 <DIR>      files2
27/07/2017 13.26 <DIR>      Intel
14/09/2018 06.09 <DIR>      OS
10/07/2015 18.04 <DIR>      PerfLogs
26/09/2018 15.01 <DIR>      Program Files
14/09/2018 05.19 <DIR>      Program Files (x86)
11/10/2016 11.40 <DIR>      Transtool
11/10/2016 11.42 <DIR>      Users
09/10/2018 07.20 <DIR>      Windows
22/03/2018 21.34 <DIR>      xampp
               0 File(s)   0 bytes
               12 Dir(s)  91.190.648.832 bytes free

C:\>rmdir baru1
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 15.05 <DIR>      files
09/10/2018 14.58 <DIR>      files2
27/07/2017 13.26 <DIR>      Intel
14/09/2018 06.09 <DIR>      OS
10/07/2015 18.04 <DIR>      PerfLogs
26/09/2018 15.01 <DIR>      Program Files
14/09/2018 05.19 <DIR>      Program Files (x86)
11/10/2016 11.40 <DIR>      Transtool
11/10/2016 11.42 <DIR>      Users
09/10/2018 07.20 <DIR>      Windows
22/03/2018 21.34 <DIR>      xampp
               0 File(s)   0 bytes
               11 Dir(s)  91.190.644.736 bytes free

C:\>

```

6. Kemudian buat suatu folder dengan perintah md \nama\_folder. Dan cek.

```

C:\> C:\Windows\system32\cmd.exe
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 15.05 <DIR>      files
09/10/2018 14.58 <DIR>      files2
27/07/2017 13.26 <DIR>      Intel
14/09/2018 06.09 <DIR>      OS
10/07/2015 18.04 <DIR>      PerfLogs
26/09/2018 15.01 <DIR>      Program Files
14/09/2018 05.19 <DIR>      Program Files (x86)
11/10/2016 11.40 <DIR>      Transtool
11/10/2016 11.42 <DIR>      Users
09/10/2018 07.20 <DIR>      Windows
22/03/2018 21.34 <DIR>      xampp
               0 File(s)   0 bytes
               11 Dir(s)  91.190.644.736 bytes free

C:\>md \komputer
C:\>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\

09/10/2018 15.05 <DIR>      files
09/10/2018 14.58 <DIR>      files2
27/07/2017 13.26 <DIR>      Intel
09/10/2018 15.34 <DIR>      komputer
14/09/2018 06.09 <DIR>      OS
10/07/2015 18.04 <DIR>      PerfLogs
26/09/2018 15.01 <DIR>      Program Files
14/09/2018 05.19 <DIR>      Program Files (x86)
11/10/2016 11.40 <DIR>      Transtool
11/10/2016 11.42 <DIR>      Users
09/10/2018 07.20 <DIR>      Windows
22/03/2018 21.34 <DIR>      xampp
               0 File(s)   0 bytes
               12 Dir(s)  91.190.644.736 bytes free

C:\>

```

7. Lalu buat kembali suatu folder pada suatu folder dengan cara md \folder\_awal\folder\_yang\_akan\_dibuat

```
cmd C:\Windows\system32\cmd.exe
Directory of C:\

09/10/2018 15.05 <DIR>      files
09/10/2018 14.58 <DIR>      files2
27/07/2017 13.26 <DIR>      Intel
09/10/2018 15.34 <DIR>      komputer
14/09/2018 06.09 <DIR>      OS
10/07/2015 18.04 <DIR>      PerfLogs
26/09/2018 15.01 <DIR>      Program Files
14/09/2018 05.19 <DIR>      Program Files (x86)
11/10/2016 11.40 <DIR>      Transtool
11/10/2016 11.42 <DIR>      Users
09/10/2018 07.20 <DIR>      Windows
22/03/2018 21.34 <DIR>      xamp
          0 File(s)    0 bytes
          12 Dir(s)  91.190.644.736 bytes free

C:\>md \files\film
C:\>
```

## 8. Kemudian cek dengan masuk dan melihat isi direktori.

```
cmd C:\Windows\system32\cmd.exe
Directory of C:\

09/10/2018 15.05 <DIR>      files
09/10/2018 14.58 <DIR>      files2
27/07/2017 13.26 <DIR>      Intel
09/10/2018 15.34 <DIR>      komputer
14/09/2018 06.09 <DIR>      OS
10/07/2015 18.04 <DIR>      PerfLogs
26/09/2018 15.01 <DIR>      Program Files
14/09/2018 05.19 <DIR>      Program Files (x86)
11/10/2016 11.40 <DIR>      Transtool
11/10/2016 11.42 <DIR>      Users
09/10/2018 07.20 <DIR>      Windows
22/03/2018 21.34 <DIR>      xamp
          0 File(s)    0 bytes
          12 Dir(s)  91.190.644.736 bytes free

C:\>md \files\film
C:\>cd files
C:\files>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\files

09/10/2018 15.35 <DIR>      .
09/10/2018 15.35 <DIR>      ..
09/10/2018 15.35 <DIR>      film
          0 File(s)    0 bytes
          3 Dir(s)  91.190.636.544 bytes free

C:\files>
```

## Percobaan Keenam: Memindahkan file dan menampilkan isi folder secara terstruktur.

1. Buat suatu file pada folder C:\files\baru. Kemudia pindahkan file ke folder C:\files 2.



```
C:\Windows\system32\cmd.exe
C:\files>cd..
C:\>move C:\files\baru\pindah.docx C:\files2
      1 file(s) moved.

C:\>
```



```
C:\Windows\system32\cmd.exe
C:\files>cd..
C:\>move C:\files\baru\pindah.docx C:\files2
      1 file(s) moved.

C:\>move C:\files\baru\pindah.txt C:\files2
      1 file(s) moved.

C:\>
```

2. Kemudian cek pada direktori files2.

```
on C:\Windows\system32\cmd.exe
27/07/2017 13.26 <DIR>     Intel
09/10/2018 15.34 <DIR>     komputer
14/09/2018 06.09 <DIR>     OS
10/07/2015 18.04 <DIR>     Perflogs
26/09/2018 15.01 <DIR>     Program Files
14/09/2018 05.19 <DIR>     Program Files (x86)
11/10/2016 11.40 <DIR>     Transtool
11/10/2016 11.42 <DIR>     Users
09/10/2018 07.20 <DIR>     Windows
22/03/2018 21.34 <DIR>     xampp
          0 File(s)   0 bytes
          12 Dir(s)  91.189.350.400 bytes free

C:\>cd files2
C:\files2>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\files2

09/10/2018 15.39 <DIR>     .
09/10/2018 15.39 <DIR>     ..
09/10/2018 14.51           0 file2.docx
09/10/2018 15.38           0 pindah.docx
09/10/2018 15.38           0 pindah.txt
          3 File(s)   0 bytes
          2 Dir(s)  91.189.350.400 bytes free

C:\files2>
```

### 3. Kemudian lihat hiararki pada suatu folder, seperti folder files dan windows.

```
on C:\Windows\system32\cmd.exe
09/10/2018 07.20 <DIR>     Windows
22/03/2018 21.34 <DIR>     xampp
          0 File(s)   0 bytes
          12 Dir(s)  91.189.350.400 bytes free

C:\>cd files2
C:\files2>dir
Volume in drive C is System
Volume Serial Number is 4A6B-68E6

Directory of C:\files2

09/10/2018 15.39 <DIR>     .
09/10/2018 15.39 <DIR>     ..
09/10/2018 14.51           0 file2.docx
09/10/2018 15.38           0 pindah.docx
09/10/2018 15.38           0 pindah.txt
          3 File(s)   0 bytes
          2 Dir(s)  91.189.350.400 bytes free

C:\files2>cd..
C:\>tree c:\files
Folder PATH listing for volume System
Volume serial number is 4A6B-68E6
C:\FILES
    |---baru
        |---film
```

```
C:\> C:\Windows\system32\cmd.exe
x86_system_enterservices_b03f5ff1ld50a3a_4.0.10240.16384_none_2d294c34bec1feeb
x86_system_printing_31bf3856ad364e35_4.0.10240.16384_none_21d09246a470cecd
x86_system_transactions_b77a5c561934e089_4.0.10240.16384_none_6b0d6dd0d79387619
x86_system_web_b03f5ff7f1ld50a3a_4.0.10240.16384_none_4eaaf5924272e38ba
x86_taskschedulersettings_resources_31bf3856ad364e35_10.0.10240.16384_en-us_9f4ee13110079c7f
x86_wcf-m_smsschost_exe_cnf_31bf3856ad364e35_10.0.10240.16384_none_a995d427fb5dc169
x86_wcf-m_smsschost_perfc_c_reg_31bf3856ad364e35_10.0.10240.16384_none_dc2f7971f100d395
x86_wcf-m_smsschost_perfc_c_vrg_31bf3856ad364e35_10.0.10240.16384_none_e1f2fba7ed4c74f4
x86_wcf-m_sm_cfg_ins_exe_31bf3856ad364e35_10.0.10240.16384_none_ar03323af75c5d9
x86_wcf-m_sm_evt_dll_vista_31bf3856ad364e35_10.0.10240.16384_none_244c070f7ab17a01
x86_wcf-m_sm_ins_rc_dll_31bf3856ad364e35_10.0.10240.16384_none_74de1b82c147c94
x86_wcf-m_sm_ins_rc_dll_31bf3856ad364e35_10.0.10240.16384_none_72b67288722f6b8e
x86_wcf-m_svc_mod_end_perf_c_reg_31bf3856ad364e35_10.0.10240.16384_none_7879f4b66e7b9c6d
x86_wcf-m_svc_mod_end_perf_c_vrg_31bf3856ad364e35_10.0.10240.16384_none_73a15f9e0e0d0d1c
x86_wcf-m_svc_mod_op_perf_c_reg_31bf3856ad364e35_10.0.10240.16384_none_74daed5ae0165a75
x86_wcf-m_svc_mod_op_perf_c_vrg_31bf3856ad364e35_10.0.10240.16384_none_229ce83d718524d1
x86_wcf-m_svc_mod_svc_perf_c_vrg_31bf3856ad364e35_10.0.10240.16384_none_28606736dd0c630
x86_wcf-m_svc_mod_sup_dll_31bf3856ad364e35_10.0.10240.16384_none_51bfdb782dee444b
x86_wcf-m_tx_bridge_perf_c_reg_31bf3856ad364e35_10.0.10240.16384_none_2878312613158ffd
x86_wcf-m_tx_bridge_perf_c_vrg_31bf3856ad364e35_10.0.10240.16384_none_2e3bb35c0f61315c
x86_wcf-system_identitymodel_selectors_b03f5ff7f1ld50a3a_10.0.10240.16384_none_3179031ea62581bd
x86_wcf-system_identitymodel_b03f5ff7f1ld50a3a_10.0.10240.16384_none_f3b013bb591d44f
x86_wcf-system_io_log_b03f5ff7f1ld50a3a_10.0.10240.16384_none_e875491b3031a064
x86_wcf-system_runtime_serialization_b03f5ff7f1ld50a3a_10.0.10240.16384_none_d5485b0495c85ab6
x86_wcf-system_servicemodel_b03f5ff7f1ld50a3a_10.0.10240.16384_none_e2006a069881868
x86_windows_id-connect_r_vridnsp_resources_31bf3856ad364e35_10.0.10240.16384_en-us_13ed3a5c46fc567
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_de-de_670354ef881501c3
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_en-gb_086b6fca7bc59c3
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_en-us_0ff42ae976f20d88
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_es-es_0ffbf87cc7719ff2d
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_es_mx_11ff6757275ade2d8
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_fr-ca_aeed48156e4c7bb5
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_fr-fr_b276fdcb69ec158f
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_it-it_9c9ef412411fb0d
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_ja-jp_3ec4731f34390c0e8
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_ko-kr_c22e4fd426a9d3fe
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_pt-br_1190616ce3a70b27
x86_windows_media_speech_vmrnt_resources_31bf3856ad364e35_10.0.10240.16384_zh-cn_6ff795565e14e79a
x86_windowssearchcomponent_31bf3856ad364e35_7.0.10240.16384_none_859fd0961599e1f4
x86_wordbreakerstemmer-neutral_legacy_31bf3856ad364e35_7.0.10240.16384_none_56754738860b73be
x86_wpf_presentationhostexe_31bf3856ad364e35_10.0.10240.16384_none_1bd6097c926db7a7
x86_wpf_presentationhostproxy_31bf3856ad364e35_10.0.10240.16384_none_d66cec75cief6d9
```

## TUGAS

1. Buat file multimedia pada drive D:

```

C:\>D:
D:\>cmd \multimedia
D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

13/05/2018 14.39 <DIR> ADOBE
09/08/2018 15.15 <DIR> Aplikasi
09/10/2018 15.26 <DIR> baru
28/04/2018 15.17 <DIR> CETAK
16/08/2018 16.21 <DIR> DESAINKU
25/06/2018 12.06 <DIR> FFOutput
09/10/2018 14.51 0 file2.docx
28/08/2018 16.28 <DIR> FILM
18/07/2018 07.44 <DIR> FOTO
11/04/2018 11.09 <DIR> HP
12/07/2018 20.24 <DIR> leaves-and-wombats
09/10/2018 15.45 <DIR> multimedia
15/08/2018 09.32 <DIR> MUSIC
10/08/2018 18.22 <DIR> TUTORIAL
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
               1 File(s)          0 bytes
               15 Dir(s) 392.181.448.704 bytes free

D:\>

```

2. Kemudia lihat isi direktori D: apakah sudah ada file atau belum.

```

C:\>D:
D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

16/08/2018 16.21 <DIR> DESAINKU
25/06/2018 12.06 <DIR> FFOutput
09/10/2018 14.51 0 file2.docx
28/08/2018 16.28 <DIR> FILM
18/07/2018 07.44 <DIR> FOTO
11/04/2018 11.09 <DIR> HP
12/07/2018 20.24 <DIR> leaves-and-wombats
09/10/2018 15.45 <DIR> multimedia
16/08/2018 09.22 <DIR> MUSIC
10/08/2018 18.22 <DIR> TUTORIAL
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
               1 File(s)          0 bytes
               15 Dir(s) 392.181.448.704 bytes free

D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

17/05/2018 14.30 <DIR> ADOBE
22/05/2018 11.26 382.315 alun.jpg
09/01/2018 05.14 3.951.020 bahagia.mp3
27/06/2018 13.26 <DIR> baru
28/04/2018 15.17 <DIR> CETAK
16/08/2018 16.21 <DIR> DESAINKU
31/06/2018 13.05 <DIR> FFOutput
09/10/2018 14.51 0 file2.docx
28/06/2018 16.28 <DIR> FILM
18/07/2018 07.44 <DIR> FOTO
11/04/2018 11.09 <DIR> HP
12/07/2018 20.24 <DIR> leaves-and-wombats
09/10/2018 15.45 <DIR> multimedia
10/06/2018 09.22 <DIR> MUSIC
09/10/2018 15.47 0 teks.txt
10/06/2018 10.22 <DIR> TUTORIAL
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
               4 File(s)        4.333.335 bytes
               15 Dir(s) 392.177.111.040 bytes free

D:\>

```

3. Kemudian copy file ke folder multimedia.

```
cmd C:\Windows\system32\cmd.exe
09/10/2018 15.45 <DIR> multimedia
16/08/2018 09.22 <DIR> MUSIC
10/08/2018 16.22 <DIR> TUTORIAL
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
    1 File(s) 0 bytes
    15 Dir(s) 392.181.448.704 bytes free

D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

13/05/2018 14.39 <DIR> ADOBE
22/05/2018 11.26 382.315 alun.jpg
09/10/2018 15.15 <DIR> Aplikasi
09/01/2018 05.14 3.951.020 bahagia.mp3
09/10/2018 15.26 <DIR> baru
28/04/2018 15.17 <DIR> CETAK
16/08/2018 16.21 <DIR> DESAINKU
25/06/2018 12.06 <DIR> FFOutput
09/10/2018 14.51 0 file2.docx
28/08/2018 16.28 <DIR> FILM
18/07/2018 07.44 <DIR> FOTO
11/04/2018 11.09 <DIR> HP
12/07/2018 20.24 <DIR> leaves-and-wombats
09/10/2018 15.45 <DIR> multimedia
16/08/2018 09.22 <DIR> MUSIC
09/10/2018 15.47 0 teks.txt
10/08/2018 16.22 <DIR> TUTORIAL
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
    4 File(s) 4.333.335 bytes
    15 Dir(s) 392.177.111.040 bytes free

D:\>copy D:\alun.jpg
The file cannot be copied onto itself.
    0 file(s) copied.

D:\>copy D:\alun.jpg D:\multimedia
    1 file(s) copied.

D:\>
```

```
cmd C:\Windows\system32\cmd.exe
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
    1 File(s) 0 bytes
    15 Dir(s) 392.181.448.704 bytes free

D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

13/05/2018 14.39 <DIR> ADOBE
22/05/2018 11.26 382.315 alun.jpg
09/10/2018 15.15 <DIR> Aplikasi
09/01/2018 05.14 3.951.020 bahagia.mp3
09/10/2018 15.26 <DIR> baru
28/04/2018 15.17 <DIR> CETAK
16/08/2018 16.21 <DIR> DESAINKU
25/06/2018 12.06 <DIR> FFOutput
09/10/2018 14.51 0 file2.docx
28/08/2018 16.28 <DIR> FILM
18/07/2018 07.44 <DIR> FOTO
11/04/2018 11.09 <DIR> HP
12/07/2018 20.24 <DIR> leaves-and-wombats
09/10/2018 15.45 <DIR> multimedia
16/08/2018 09.22 <DIR> MUSIC
09/10/2018 15.47 0 teks.txt
10/08/2018 16.22 <DIR> TUTORIAL
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
    4 File(s) 4.333.335 bytes
    15 Dir(s) 392.177.111.040 bytes free

D:\>copy D:\alun.jpg
The file cannot be copied onto itself.
    0 file(s) copied.

D:\>copy D:\alun.jpg D:\multimedia
    1 file(s) copied.

D:\>copy D:\bahagia.mp3 D:\multimedia
    1 file(s) copied.

D:\>
```

```
cmd C:\Windows\system32\cmd.exe
      15 Dir(s) 392.181.448.704 bytes free

D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

13/05/2018  14.39    <DIR>      ADOBE
22/05/2018  11.26    382.315  alun.jpg
09/10/2018  15.15    <DIR>      Aplikasi
09/01/2018  05.14    3.951.020 bahagia.mp3
09/10/2018  15.26    <DIR>      baru
28/04/2018  15.17    <DIR>      CETAK
16/08/2018  16.21    <DIR>      DESAINKU
25/06/2018  12.06    <DIR>      FFOutput
09/10/2018  14.51    0 file2.docx
28/08/2018  16.28    <DIR>      FILM
18/07/2018  07.44    <DIR>      FOTO
11/04/2018  11.09    <DIR>      HP
12/07/2018  20.24    <DIR>      leaves-and-wombats
09/10/2018  15.45    <DIR>      multimedia
16/08/2018  09.22    <DIR>      MUSIC
09/10/2018  15.47    0 teks.txt
10/08/2018  16.22    <DIR>      TUTORIAL
18/05/2018  20.07    <DIR>      Wallpaper
31/07/2018  16.36    <DIR>      zia
        4 File(s)   4.333.335 bytes
      15 Dir(s) 392.177.111.040 bytes free

D:\>copy D:\alun.jpg
The file cannot be copied onto itself.
      0 file(s) copied.

D:\>copy D:\alun.jpg D:\multimedia
      1 file(s) copied.

D:\>copy D:\bahagia.mp3 D:\multimedia
      1 file(s) copied.

D:\>copy D:\file2.docx D:\multimedia
      1 file(s) copied.

D:\>
```

```
cmd C:\Windows\system32\cmd.exe
      15 Dir(s) 392.181.448.704 bytes free

D:\>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\

13/05/2018  14.39    <DIR>      ADOBE
22/05/2018  11.26    382.315  alun.jpg
09/10/2018  15.15    <DIR>      Aplikasi
09/01/2018  05.14    3.951.020 bahagia.mp3
09/10/2018  15.26    <DIR>      baru
28/04/2018  15.17    <DIR>      CETAK
16/08/2018  16.21    <DIR>      DESAINKU
25/06/2018  12.06    <DIR>      FFOutput
09/10/2018  14.51    0 file2.docx
28/08/2018  16.28    <DIR>      FILM
18/07/2018  07.44    <DIR>      FOTO
11/04/2018  11.09    <DIR>      HP
12/07/2018  20.24    <DIR>      leaves-and-wombats
09/10/2018  15.45    <DIR>      multimedia
16/08/2018  09.22    <DIR>      MUSIC
09/10/2018  15.47    0 teks.txt
10/08/2018  16.22    <DIR>      TUTORIAL
18/05/2018  20.07    <DIR>      Wallpaper
31/07/2018  16.36    <DIR>      zia
        4 File(s)   4.333.335 bytes
      15 Dir(s) 392.177.111.040 bytes free

D:\>copy D:\alun.jpg
The file cannot be copied onto itself.
      0 file(s) copied.

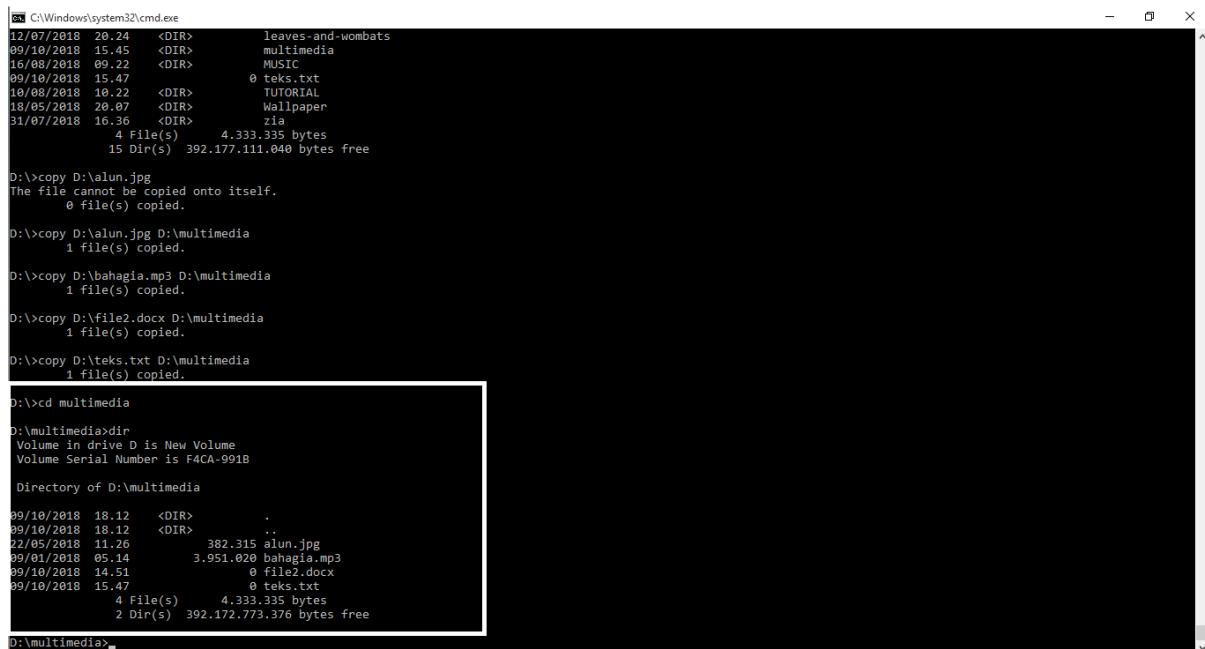
D:\>copy D:\alun.jpg D:\multimedia
      1 file(s) copied.

D:\>copy D:\bahagia.mp3 D:\multimedia
      1 file(s) copied.

D:\>copy D:\file2.docx D:\multimedia
      1 file(s) copied.

D:\>copy D:\teks.txt D:\multimedia
      1 file(s) copied.
```

#### 4. Lalu cek pada folder multimedia.



```
C:\Windows\system32\cmd.exe
12/07/2018 20.24 <DIR> leaves-and-wombats
09/10/2018 15.45 <DIR> multimedia
16/08/2018 09.22 <DIR> MUSIC
09/10/2018 15.47 0 teks.txt
10/08/2018 10.22 <DIR> TUTORIAL
18/05/2018 20.07 <DIR> Wallpaper
31/07/2018 16.36 <DIR> zia
        4 File(s) 4.333.335 bytes
      15 Dir(s) 392.177.111.040 bytes free

D:>copy D:\alun.jpg
The file cannot be copied onto itself.
    0 file(s) copied.

D:>copy D:\alun.jpg D:\multimedia
    1 file(s) copied.

D:>copy D:\bahagia.mp3 D:\multimedia
    1 file(s) copied.

D:>copy D:\file2.docx D:\multimedia
    1 file(s) copied.

D:>copy D:\teks.txt D:\multimedia
    1 file(s) copied.

D:>cd multimedia
D:\multimedia>dir
Volume in drive D is New Volume
Volume Serial Number is F4CA-991B

Directory of D:\multimedia

09/10/2018 18.12 <DIR> .
09/10/2018 18.12 <DIR> ..
22/05/2018 11.26 382.315 alun.jpg
09/01/2018 05.14 3.951.020 bahagia.mp3
09/10/2018 14.51 0 file2.docx
09/10/2018 15.47 0 teks.txt
        4 File(s) 4.333.335 bytes
      2 Dir(s) 392.172.773.376 bytes free

D:\multimedia>
```

## Laporan 5

Nama : Muhammad Khoiruddin

NIM : L200170104

Kelas : E

1. ketik cmd lanjutkan dengan cd od dan cd LAB/LAB3. Masukan perintah ‘s’ lalu enter lalu layar akan muncul pc simulator yang terlihat geap,tidak ada aktifitas, dan tidak terjadi kesalahan. Kondisi dibawah ini menjelaskan bahwa kondisi PC sedang paa mode “ Real Mode” yang sedang akan menjalankan program yg pertama kali(0). Yaitu program yg terdapat pada program “F00:FFF0” lokasi tersebut paling atas pada pc dan biasanya digunakan untuk menyimpan alamat ROM BIOS. Selanjutnya akan memanggil program yg terdapat pada BIOS . pertama kali yg dilakukan BIOS adalah loncat ke alamat yg lebih rendah yaitu alamat f000:e05b terlihat pada layar sebagai baris perintah jmp far f000:e05b. Kode ‘ea’ adalah kode untuk perintah ‘jmp far’ sedangkan data 8 byte berikutnya merupakan lokasi alamat . lokasi program yg akan dijalankan oleh PC pada mode kerja ‘Real-Mode’ adalah lokasi yg ditunjuk oleh kombinasi register CS:IP. Lalu sekarang ketik ‘r’ lalu enter. Selanjutnya ketik ‘s’ lalu enter. Lanjut ketik ‘r’ enter. Pada layar akan tampil teks dibawah ini.

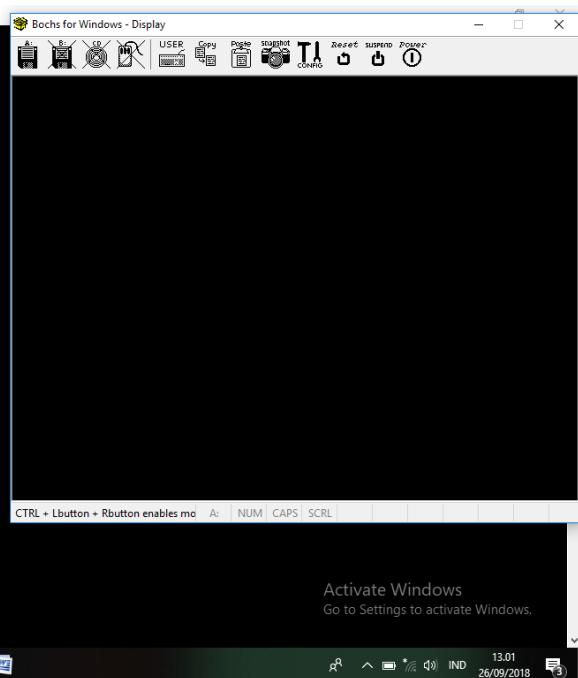
```
Bochs for Windows - Console

C:\05>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;C:\Windows;C:\Windows\System32
C:\05>cd LAB\LAB3

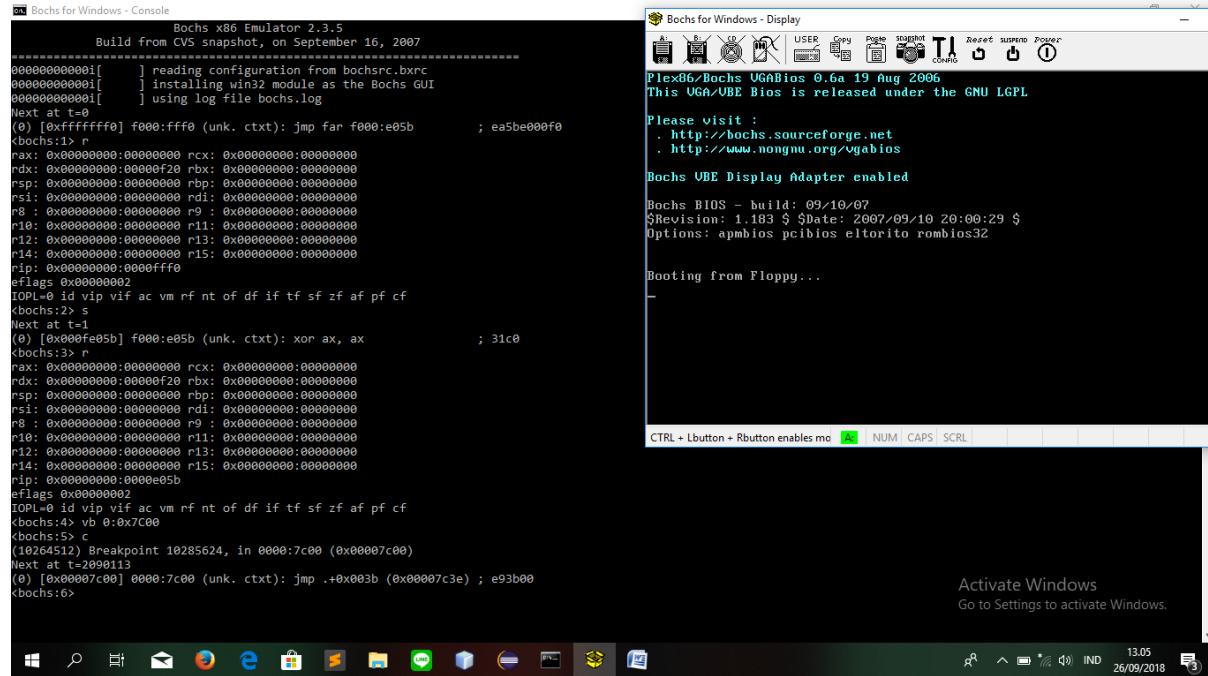
C:\OS\LAB\LAB3>s

C:\OS\LAB\LAB3>..\bochs-2.3.5\bochsrc -q -f bochsrc.bxrc
000000000001[APIC] local_apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007

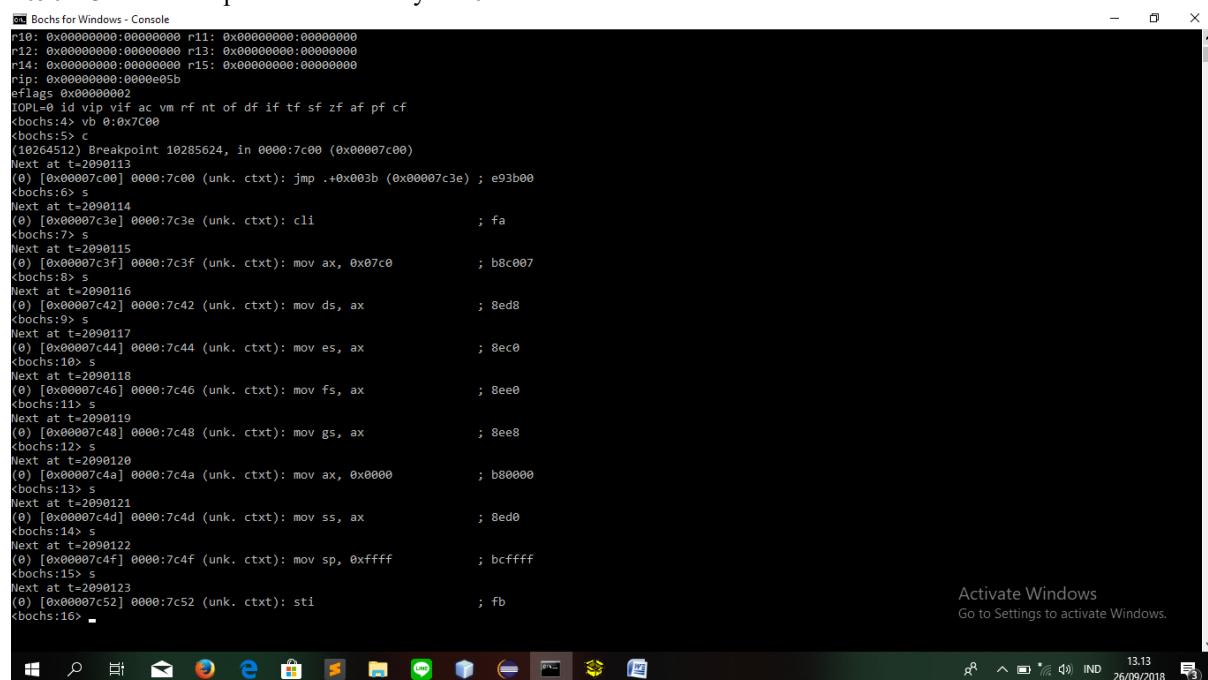
000000000001[      ] reading configuration from bochsrc.bxrc
000000000001[      ] installing win32 module as the Bochs GUI
000000000001[      ] using log file bochs.log
Next at t=0
(0) [0xfffffff0] f000:ffff0 (unk. ctxt): jmp far f000:e05b ; ea5be000f0
<bochs:1> r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:000000f0 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:000ffff0
eflags 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:2> s
Next at t=1
(0) [0xb000fe05b] f000:e05b (unk. ctxt): xor ax, ax ; 31c0
<bochs:3> r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:000000f0 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000e05b
eflags 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:4>
```



2. jika jika memasukan perinta ‘s’ secara berulang initidak akan selesai dalam waktu satu hari. Ada cara yang lbih efektif yaitu masukan perintah ‘vb 0:0x7c00’ lalu enter . masud dari perintah ini adalah membuat titik pemberhentian (halte) pada alamat 0000:7c000. Lalu masukan perintah ‘c’ lalu enter . maksut perintah ini adalah teruskan (contine) prosesnya sampai pada pemberhentian. Jumlah clock dihitung sejak power on t=2090113. Sedangkan PC simulator menampilkan Booting from floppy.



4. sekarang PC sudah masuk tahap ‘BOOTSTRAP-LOADER’. Pc ini sudah menghabiskan clock sebanyak 2090113. Jalan kan perintah ‘s’ sebanyak 10 kali .



5. lalu bandingkan hasilnya dengan program yg terdapat pada boot.asm. caranya bukalah file boot.asm lalu akan muncul pada notepad. Lalu bandingkanlah hasil dari 10 kali instruksi tadi dengan program boot.asm yg ada pada notepad. Jika hasilnya sama maka anda berhasil . jika tidak sama atau terjadi kesalahan anda dapat menghentikan proses ‘q’.

The screenshot shows two windows side-by-side. The left window is a command-line interface titled 'Select Bochs for Windows - Console' displaying assembly code from memory dump files. The right window is a Notepad titled 'boot.asm - Notepad' containing handwritten assembly pseudocode.

**Console Window (Left):**

```
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs>:4> vb 0x0x7C00
<bochs>:5> e
(0x10264512) Breakpoint 10285624, in 0000:7c00 (0x00007c00)
Next at t=<20090113
(0) [0x00007c00] 0000:7c00 (unk. ctxt): jmp .+0x003b (0x00007c3e) ; e93b00
<bochs>:6> s
Next at t=<20090114
(0) [0x00007c3e] 0000:7c3e (unk. ctxt): cli ; fa
<bochs>:7> s
Next at t=<20090115
(0) [0x00007c3f] 0000:7c3f (unk. ctxt): mov ax, 0x07c0 ; b8c007
<bochs>:8> s
Next at t=<20090116
(0) [0x00007c42] 0000:7c42 (unk. ctxt): mov ds, ax ; 8ed8
<bochs>:9> s
Next at t=<20090117
(0) [0x00007c44] 0000:7c44 (unk. ctxt): mov es, ax ; 8ec0
<bochs>:10> s
Next at t=<20090118
(0) [0x00007c46] 0000:7c46 (unk. ctxt): mov fs, ax ; 8ee0
<bochs>:11> s
Next at t=<20090119
(0) [0x00007c48] 0000:7c48 (unk. ctxt): mov gs, ax ; 8ee8
<bochs>:12> s
Next at t=<20090120
(0) [0x00007c4a] 0000:7c4a (unk. ctxt): mov ax, 0x0000 ; b80000
<bochs>:13> s
Next at t=<20090121
(0) [0x00007c4d] 0000:7c4d (unk. ctxt): mov ss, ax ; 8ed0
<bochs>:14> s
Next at t=<20090122
(0) [0x00007c4f] 0000:7c4f (unk. ctxt): mov sp, 0xffff ; bcffff
<bochs>:15> s
Next at t=<20090123
(0) [0x00007c52] 0000:7c52 (unk. ctxt): sti ; fb
<bochs>:16>
```

**Notepad Window (Right):**

```
boot.asm - Notepad
File Edit Format View Help
=====
START:
; Mengatur lokasi kode program pada alamat 7C00:0000, dan mengatur REGISTER S
        cli                                ; matikan aktifitas interupsi
        mov     ax, 0x07C0
        mov     ds, ax
        mov     es, ax
        mov     fs, ax
        mov     gs, ax

; Mengatur lokasi stack
        mov     ax, 0x0000
        mov     ss, ax
        mov     sp, 0xFFFF ; sp bergerak dari alamat atas ke bawah
        sti                                ; aktifkan aktifitas interupsi

; Menampilkan text di layar
        mov     si,msgLoading ; mengambil lokasi text yang di simpan dal
        call    DisplayMessage

LOAD_ROOT:
; menghitung ukuran 'root directory' dan menyimpannya dalam register 'cx'
        xor     cx,cx
        xor     dx,dx
        mov     ax,0x0020 ; Ukuran satu nama direktori sepanjang
        mul    WORD [MaxRootEntries] ; Total lokasi direktori 32
        div    WORD [BytesPerSector] ; lokasi sektor yang digunakan
        xchg   ax, cx ; Ukuran 'root direktor

; menghitung jumlah sektor yang digunakan untuk menyimpan FAT
; untuk mencari lokasi awal sektor ROOT DIREKTORI di simpan di register 'ax'
```

6. ketik perintah ‘s’ lalu enter. Lalu selanjutnya ketik perintah ‘c’ enter. Jika langkah anda benar dan sesuai dengan petunjuk diatas maka layar ‘debugging’ akan menampilkan tampilan dibawah ini

```
Bochs for Windows - Console
Next at t=2000120
(0) [0x00007c4] 0000:7c4a (unk. ctxt): mov ax, 0x0000 ; b80000
<bochs:13> s
Next at t=2000121
(0) [0x00007c4d] 0000:7c4d (unk. ctxt): mov ss, ax ; 8ed0
<bochs:14> s
Next at t=2000122
(0) [0x00007c4f] 0000:7c4f (unk. ctxt): mov sp, 0xffff ; bcffff
<bochs:15> s
Next at t=2000123
(0) [0x00007c52] 0000:7c52 (unk. ctxt): sti ; fb
<bochs:16> q
# In bx_win32_gui_c::exit(void)

Bochs is exiting. Press ENTER when you're ready to close this window.

C:\OS\LAB\LAB3>s

C:\OS\LAB\LAB3>..\.bochs-2.3.5\bochsbin -q -f bochsrc.bxrc
00000000000i[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007

00000000000i[     ] reading configuration from bochsrc.bxrc
00000000000i[     ] installing win32 module as the Bochs GUI
00000000000i[     ] using log file bochs.log
Next at t=0
(0) [0xfffffffff0] f000:fff0 (unk. ctxt): jmp far f000:e05b ; ea5be000f0
<bochs:1> v
<bochs:2> c
(10264512) Breakpoint 10285624, in 0100:0000 (0x00001000)
Next at t=2945013
(0) [0x00001000] 0100:0000 (unk. ctxt): mov ax, 0x0100 ; b80001
<bochs:3>

Activate Windows
Go to Settings to activate Windows.


```

7. selanjutnya ketik ‘s’ , langkah selanjutnya dapat dilakukan langsung menekan tombol enter sebanyak 10X perhatikan dan lihat hasil perubahannya. Bandingkan dengan code program kernel.asm. cara nya sama seperti membandingkan dengan boot.asm. yaitu buka pada notepad. Jika anda benar maka source-code akan sama. Langkah langkah diatas adalah merupakan salah satu cara yang banyak digunakan para pengembang perangkat lunak, termasuk pengembangan sistem operasi.

```

Lochs for Windows - Console
Lochs for Windows - Console
[0xffffffff] f000:ffff0 (unk. ctxt): jmp far f000:e05b ; ea5be000f0
hs:1> vb 0x0100:0x0000
hs:2> c
64512) Breakpoint 10285624, in 0100:0000 (0x00001000)
; Prototype SIMPLE KERNEL ver 0.01
; LAB-INFORMATIKA
; =====
; [org 0x000]
; [bits 16]
[SEGMENT .text]
;START #####
    mov ax, 0x0100 ;Lokasi memori untuk menempatkan kernel
    mov ds, ax
    mov es, ax

    cli ;set interrupt OFF
    mov ss, ax ;atur stack segment
    mov sp, 0xffff ;atur stack pointer maksimum 64k
    sti ;set interrupt ON

    push dx
    push es
    xor ax, ax
    mov es, ax
    cli
    mov word [es:0x21*4], _int0x21 ; setup interrupt service
    mov [es:0x21*4+2], cs ; untuk menampilkan karakter di layar
    sti
    pop es
    pop dx

    mov si, strWelcomeMsg ; Tampilkan informasi proses
    mov al, 0x01 ; request service 0x01
    int 0x21 ; int 0x21

Activate Windows
Go to Settings to activate Windows.

File Edit Format View Help
; =====
; [org 0x000]
; [bits 16]
[SEGMENT .text]
;START #####
    mov ax, 0x0100 ;Lokasi memori untuk menempatkan kernel
    mov ds, ax
    mov es, ax

    cli ;set interrupt OFF
    mov ss, ax ;atur stack segment
    mov sp, 0xffff ;atur stack pointer maksimum 64k
    sti ;set interrupt ON

    push dx
    push es
    xor ax, ax
    mov es, ax
    cli
    mov word [es:0x21*4], _int0x21 ; setup interrupt service
    mov [es:0x21*4+2], cs ; untuk menampilkan karakter di layar
    sti
    pop es
    pop dx

    mov si, strWelcomeMsg ; Tampilkan informasi proses
    mov al, 0x01 ; request service 0x01
    int 0x21 ; int 0x21

```

## TUGAS:

### 1. Tabel pemetaan memori pada PC

No.	Blok Memori	Alokasi Pemakaian
1	F 0 0 0 0	ROM BIOS, Diagnostic, BASIC
2	E 0 0 0 0	ROM program
3	D 0 0 0 0	ROM program
4	C 0 0 0 0	Perluasan BIOS untuk hardisk XT
5	B 0 0 0 0	Monokrom Monitor
6	A 0 0 0 0	Monitor EGA, VGS, dll
7	9 0 0 0 0	Daerah kerja pemakai s/d 640 KB
8	8 0 0 0 0	Daerah kerja pemakai s/d 576 KB
9	7 0 0 0 0	Daerah kerja pemakai s/d 512 KB
10	6 0 0 0 0	Daerah kerja pemakai s/d 448 KB
11	5 0 0 0 0	Daerah kerja pemakai s/d 384 KB
12	4 0 0 0 0	Daerah kerja pemakai s/d 320 KB
13	3 0 0 0 0	Daerah kerja pemakai s/d 256 KB
14	2 0 0 0 0	Daerah kerja pemakai s/d 192 KB
15	1 0 0 0 0	Daerah kerja pemakai s/d 128 KB
16	0 0 0 0 0	Daerah kerja pemakai s/d 64 KB

## 2. Perbedaan mode kerja “Real Mode” dan “Protected Mode”

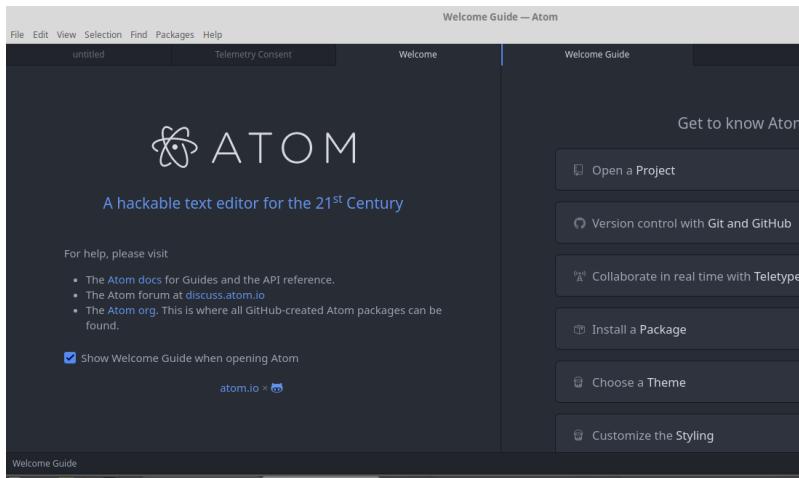
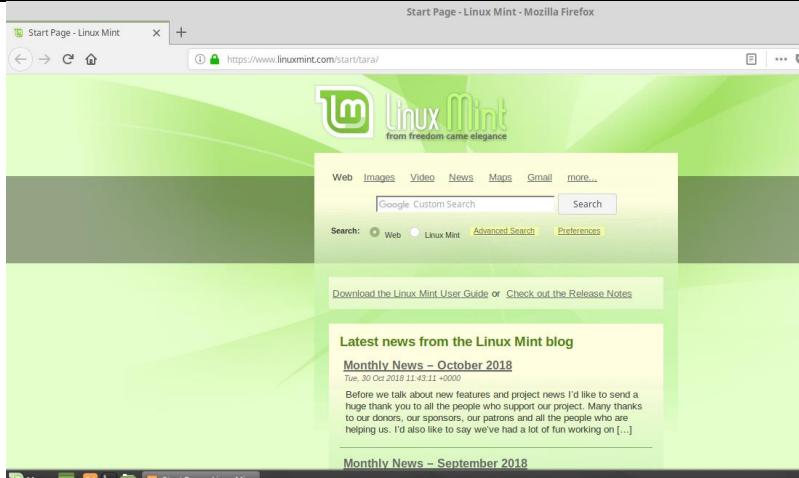
- a) **Real Mode:** Real-Mode adalah sebuah modus di mana prosesor Intel x86 berjalan seolah-olah dirinya adalah sebuah prosesor Intel 8085 atau Intel 8088, meski ia merupakan prosesor Intel 80286 atau lebih tinggi. Karenanya, modus ini juga disebut sebagai modus 8086 (8086 Mode). Dalam modus ini, prosesor hanya dapat mengeksekusi instruksi 16-bit saja dengan menggunakan register internal yang berukuran 16-bit, serta hanya dapat mengakses hanya 1024 KB dari memori karena hanya menggunakan 20-bit jalur bus alamat. Semua program DOS berjalan pada modus ini.
- b) **Protected Mode:** Modus terproteksi (protected mode) adalah sebuah modus di mana terdapat proteksi ruang alamat memori yang ditawarkan oleh mikroprosesor untuk digunakan oleh sistem operasi. Modus ini datang dengan mikroprosesor Intel 80286 atau yang lebih tinggi. Karena memiliki proteksi ruang alamat memori, maka dalam modus ini sistem operasi dapat melakukan multitasking.

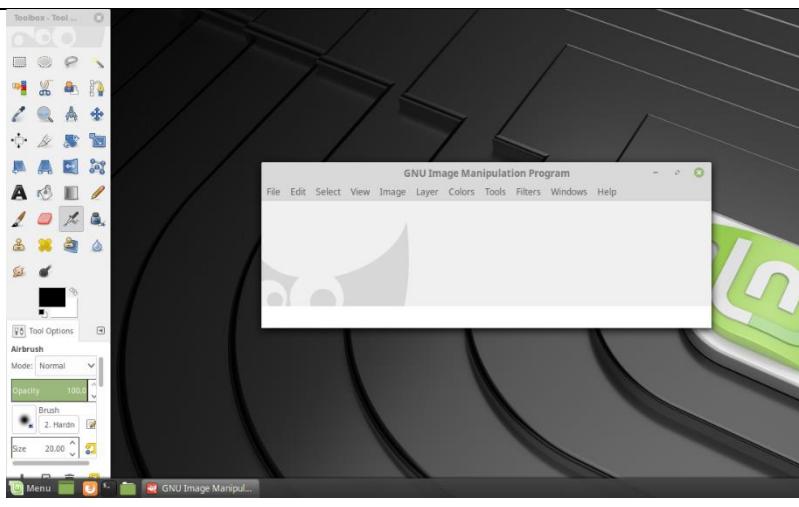
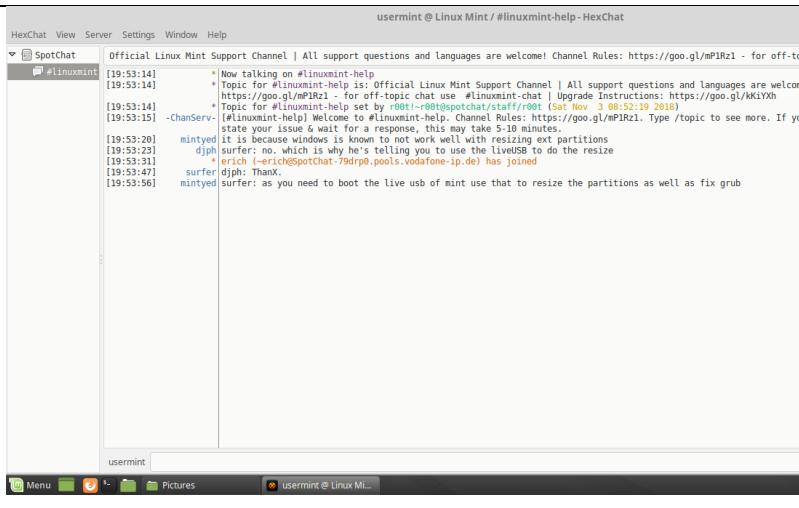
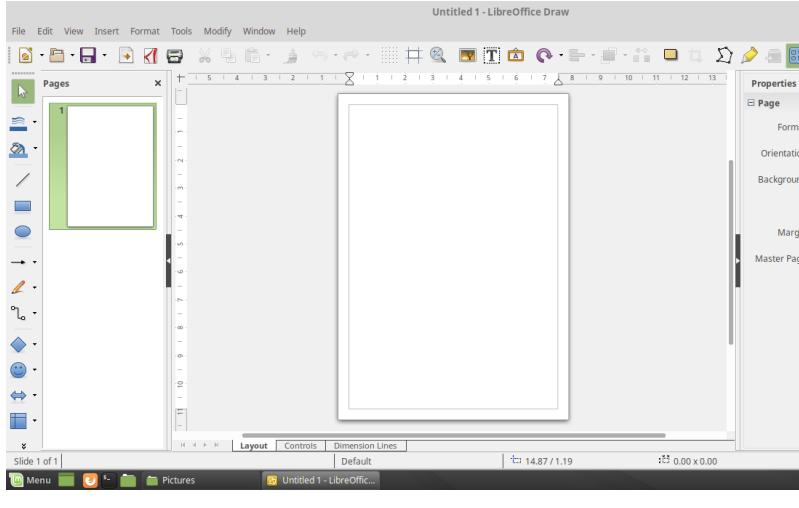
## Laporan 6

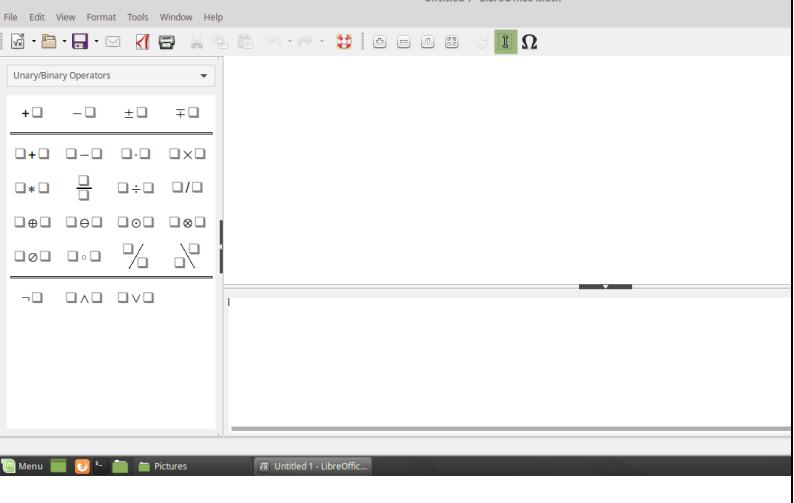
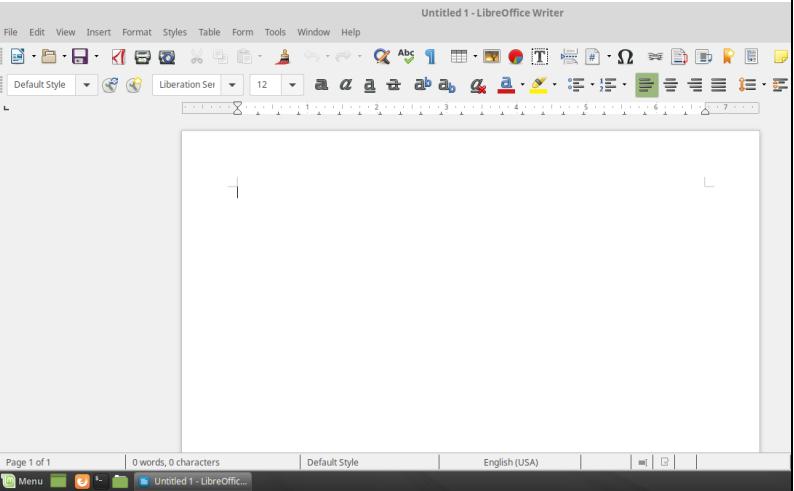
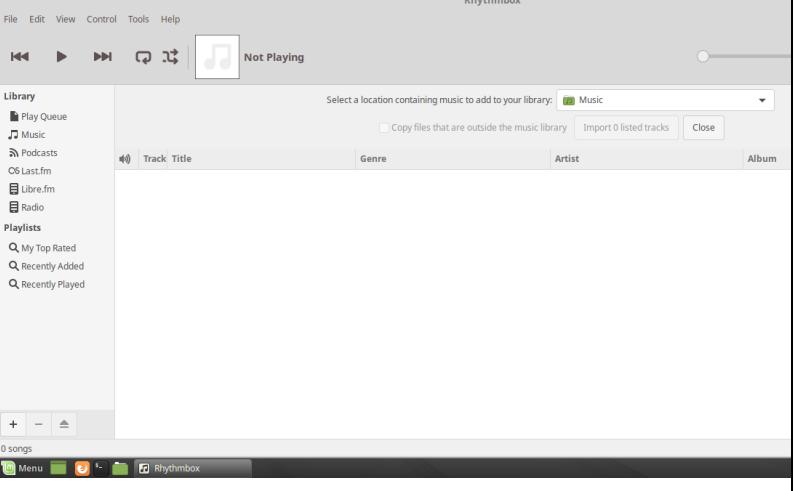
Nama : M. Khoiruddin

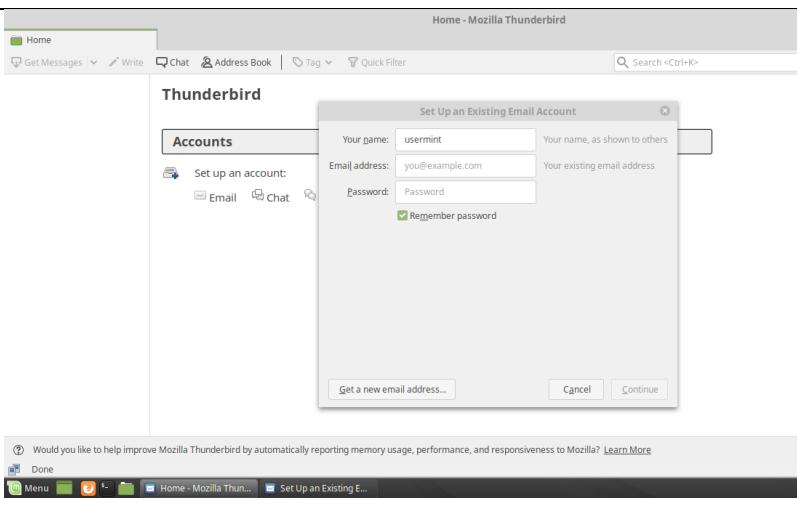
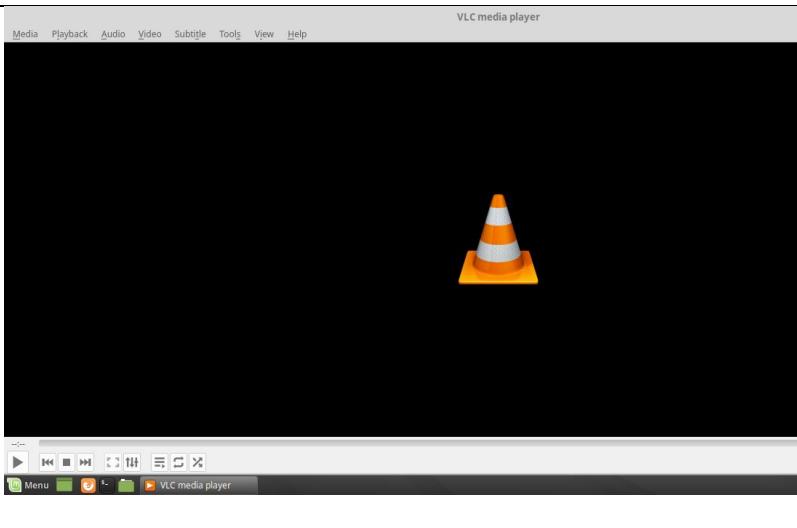
NIM : L200170104

Kelas : E

No	Aplikasi	Tampilan	Fungsi
1	Atom		Berfungsi sebagai teks editor.
2	Firefox Web Browser		Sebagai web-browser atau penjelajah web.
3	Gimp		Berfungsi sebagai aplikasi pengolah gambar.

			
4	HexChat		<p>Berfungsi sebagai aplikasi chatting IRC.</p>
5	LibreOffice Draw		<p>Berfungsi untuk membuat dan memanipulasi data gambar digital 2 dimensi.</p>

6	LibreOffice Math		<p>Berfungsi sebagai penyunting rumus atau persamaan pada dokumen teks seperti LibreOffice Writer.</p>
7	LibreOffice Writer		<p>Berfungsi sebagai aplikasi pengolah kata.</p>
8	Rhythmbox		<p>Berfungsi sebagai aplikasi pemutar lagu.</p>
9	Thunderbird		<p>Berfungsi sebagai aplikasi klien surat elektronik.</p>

			
10	VLC Media Player		<p>Berfungsi sebagai aplikasi pemutar berkas multimedia.</p>

## Laporan 7

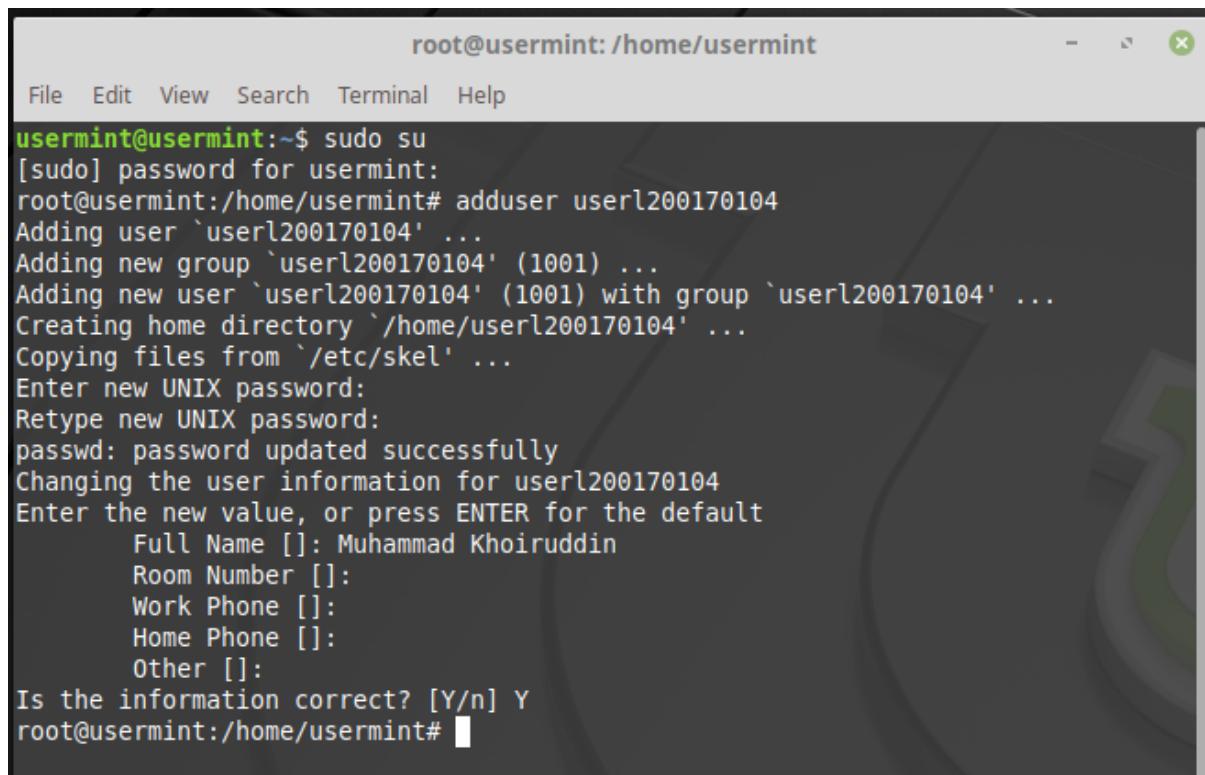
Nama : Muuhammad Khoiruddin

NIM : L200170104

Kelas : E

## Praktikum 1:

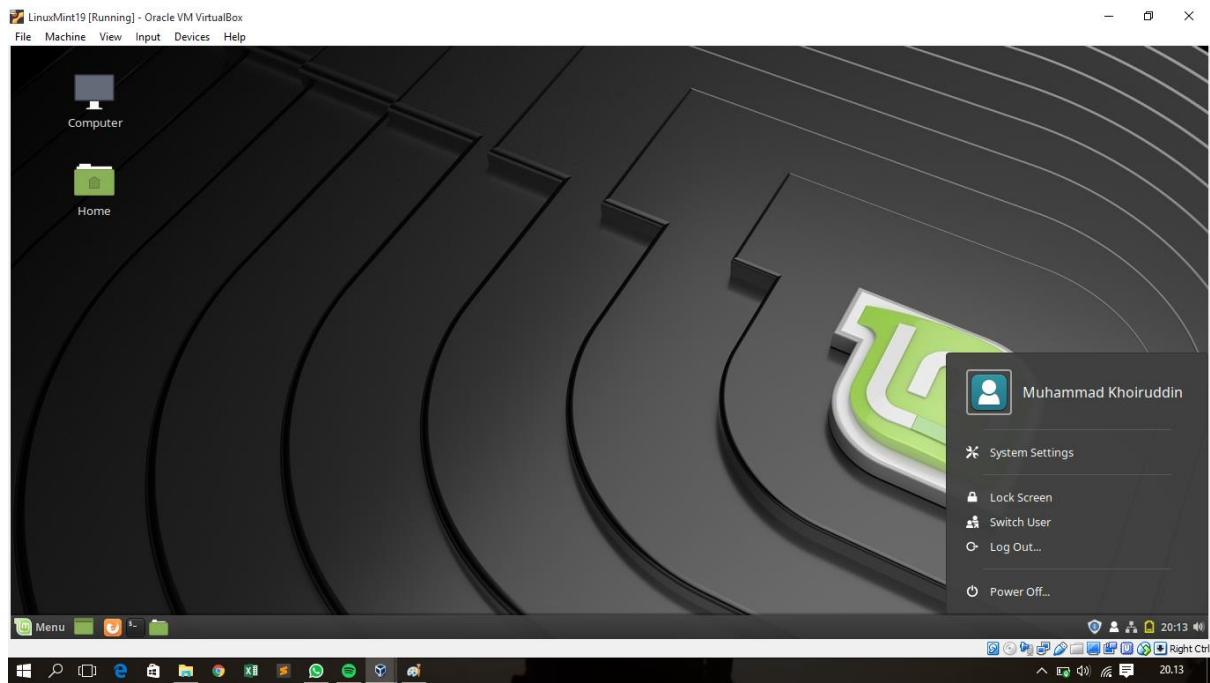
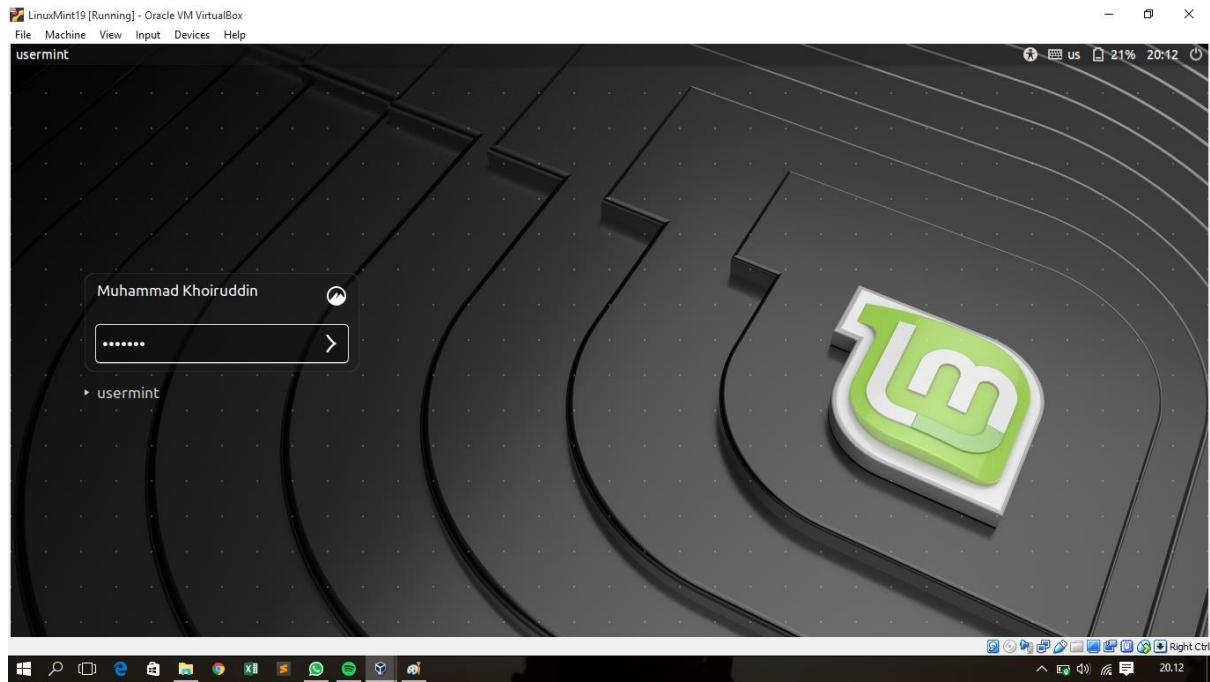
### 1. Membuat user baru



The screenshot shows a terminal window titled "root@usermint: /home/usermint". The window has a standard Linux desktop interface with a title bar, menu bar, and scroll bars. The terminal content is as follows:

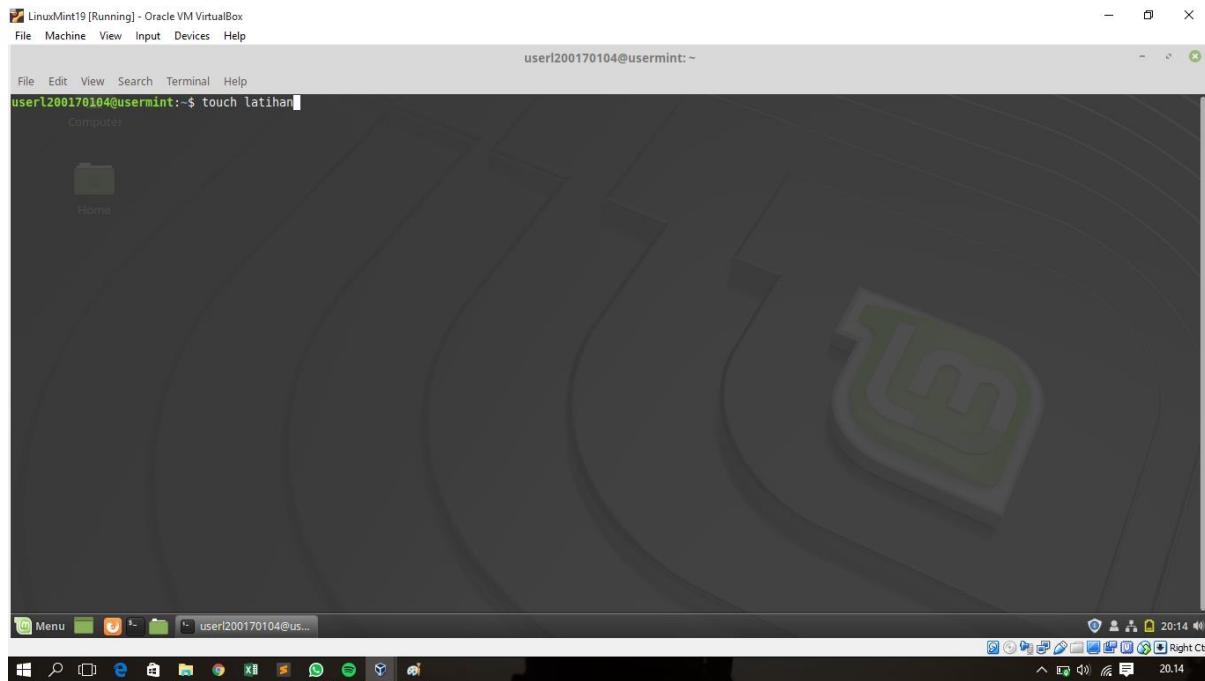
```
root@usermint: /home/usermint
File Edit View Search Terminal Help
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# adduser userl200170104
Adding user `userl200170104' ...
Adding new group `userl200170104' (1001) ...
Adding new user `userl200170104' (1001) with group `userl200170104' ...
Creating home directory `/home/userl200170104' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for userl200170104
Enter the new value, or press ENTER for the default
    Full Name []: Muhammad Khoiruddin
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] Y
root@usermint:/home/usermint#
```

## 2. Login ke user baru

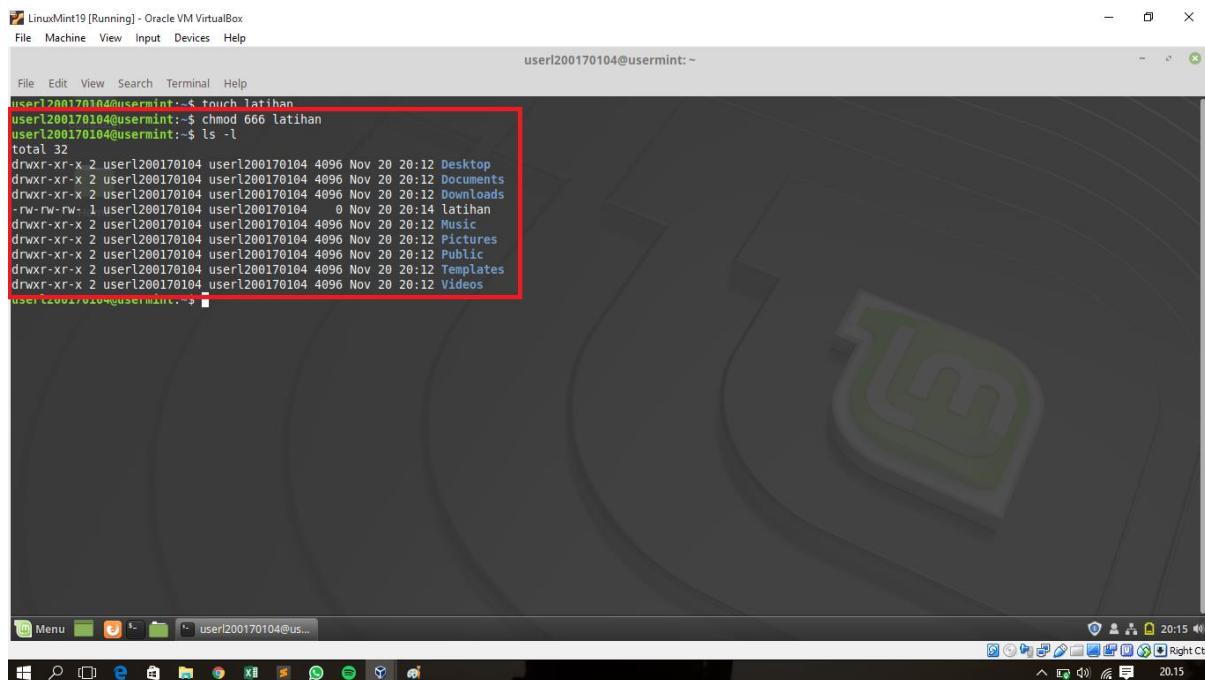


## Praktikum 2:

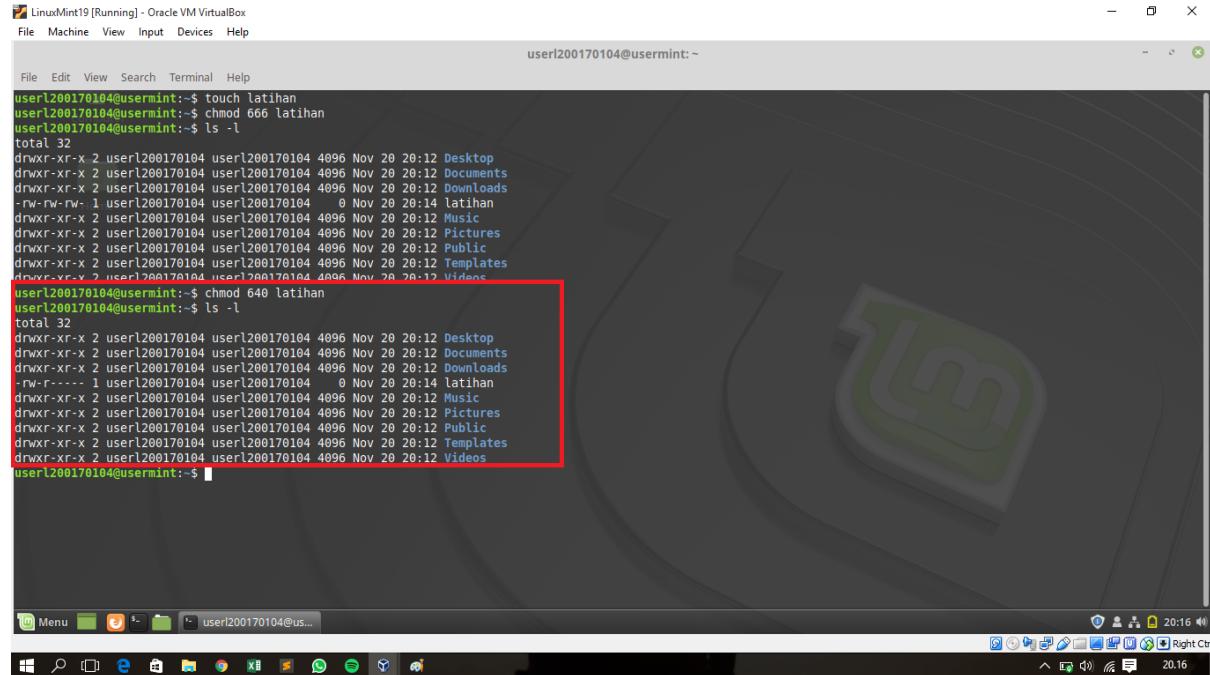
### 1. Membuat file baru



### 2. Membuat izin akses menjadi read dan write untuk semua pengguna



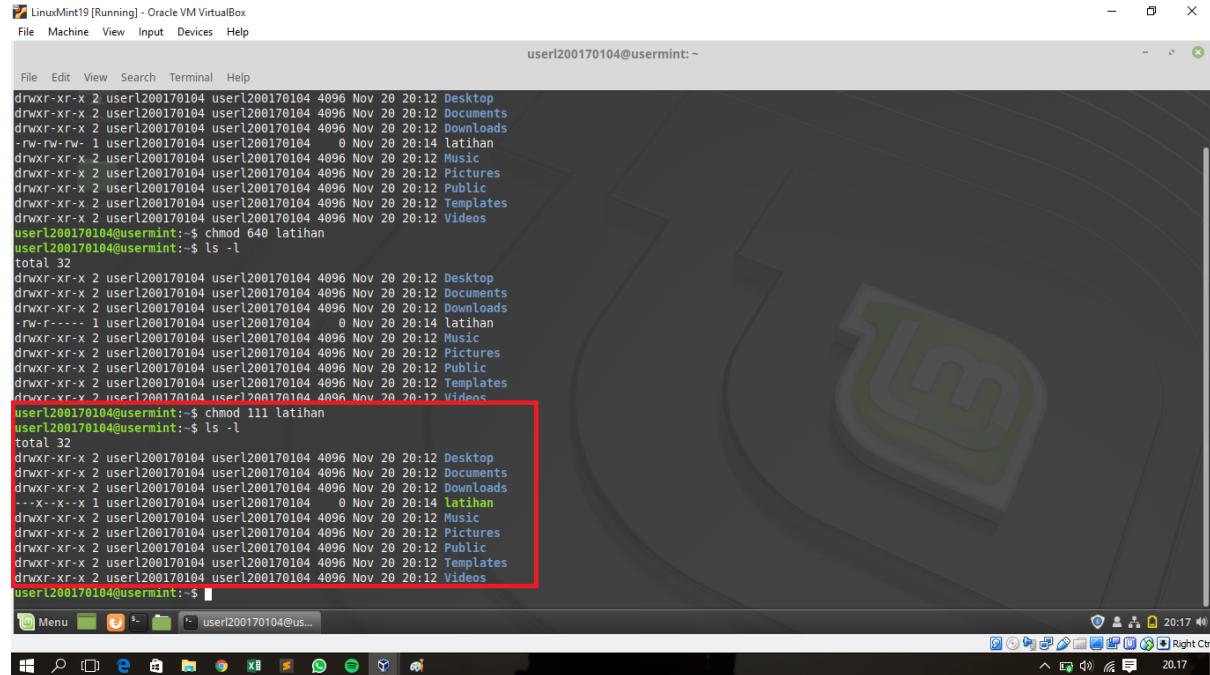
### 3. Membuat izin akses menjadi read, write untuk user dan read untuk group



```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

```
user1200170104@usermint:~$ touch latihan
user1200170104@usermint:~$ chmod 666 latihan
user1200170104@usermint:~$ ls -l
total 32
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
-rw-rw-r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$ chmod 646 latihan
user1200170104@usermint:~$ ls -l
total 32
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
-rw-r----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$
```

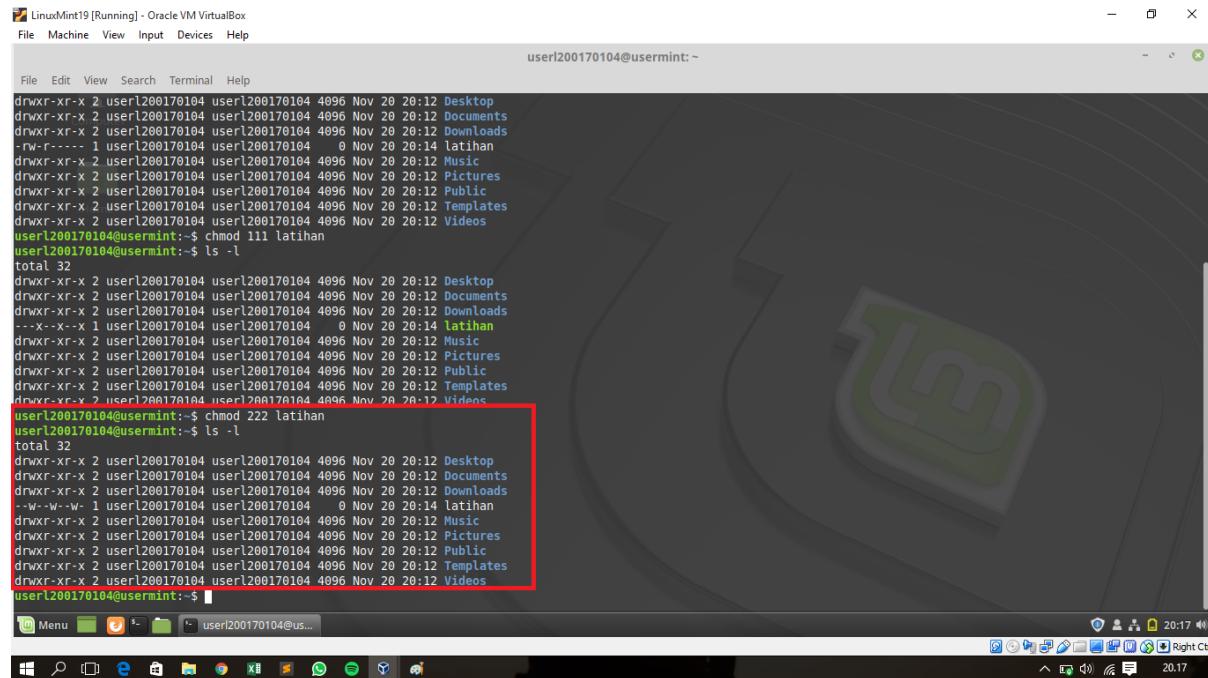
### 4. Membuat izin akses menjadi execute untuk semua pengguna



```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

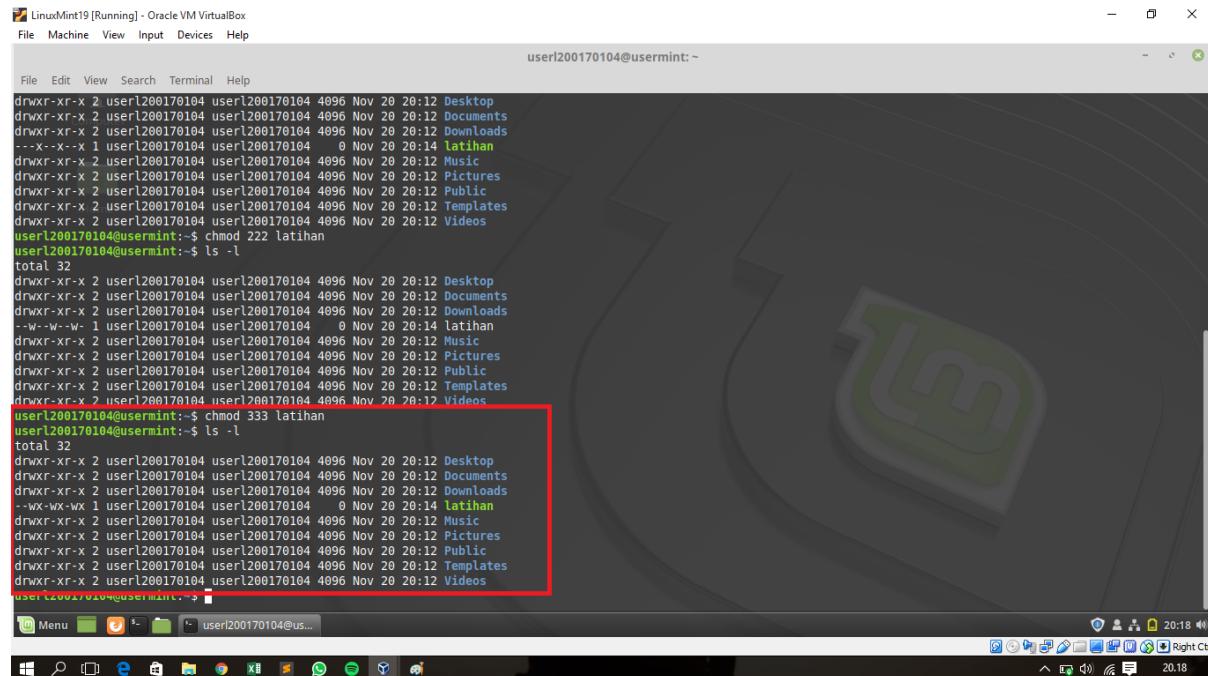
```
user1200170104@usermint:~$ touch latihan
user1200170104@usermint:~$ chmod 646 latihan
user1200170104@usermint:~$ ls -l
total 32
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
-rw-r----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$ chmod 111 latihan
user1200170104@usermint:~$ ls -l
total 32
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
-rwxr-xr-x 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$
```

## 5. Membuat izin akses menjadi write untuk semua pengguna



```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
File Edit View Search Terminal Help
user1200170104@usermint:~ user1200170104@usermint:~ ls -l
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
-rw-r----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$ chmod 111 latihan
user1200170104@usermint:~$ ls -l
total 32
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
--x--x--x 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$ chmod 222 latihan
user1200170104@usermint:~$ ls -l
total 32
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
--w--w--w 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$
```

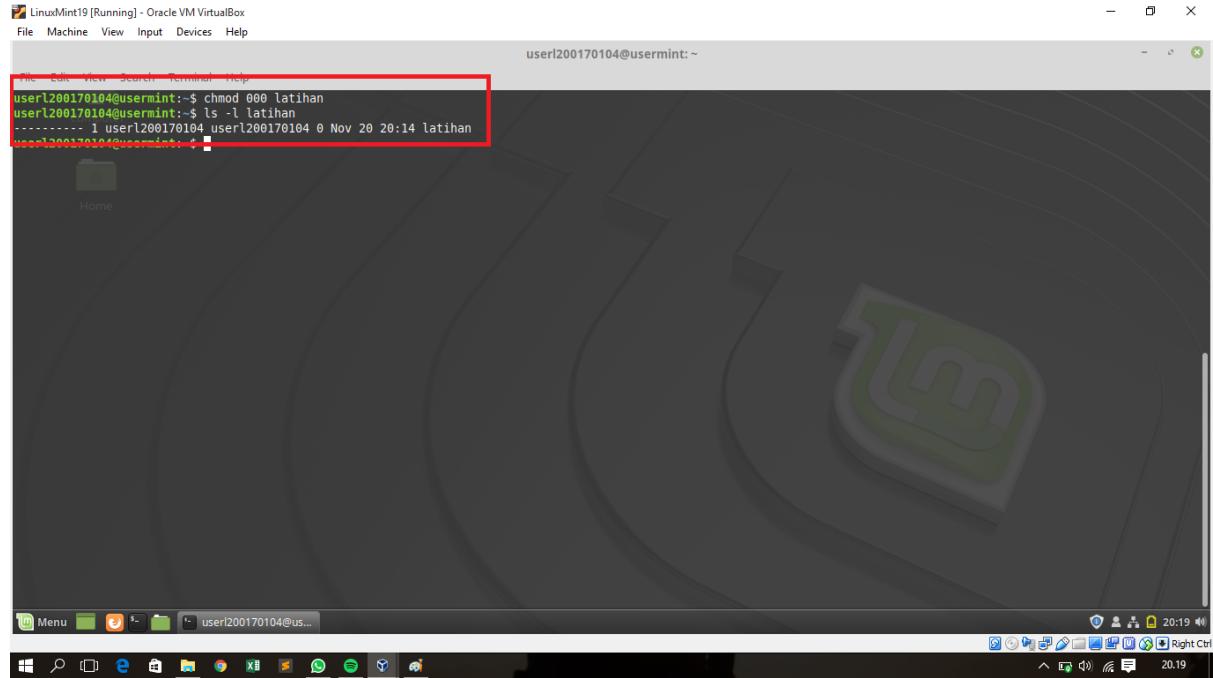
## 6. Membuat izin akses menjadi write dan execute untuk semua pengguna



```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
File Edit View Search Terminal Help
user1200170104@usermint:~ user1200170104@usermint:~ ls -l
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
--w--w--w 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$ chmod 222 latihan
user1200170104@usermint:~$ ls -l
total 32
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Desktop
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Documents
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Downloads
--wx--wx 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Music
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Pictures
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Public
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Templates
drwxr-xr-x 2 user1200170104 user1200170104 4096 Nov 20 20:12 Videos
user1200170104@usermint:~$
```

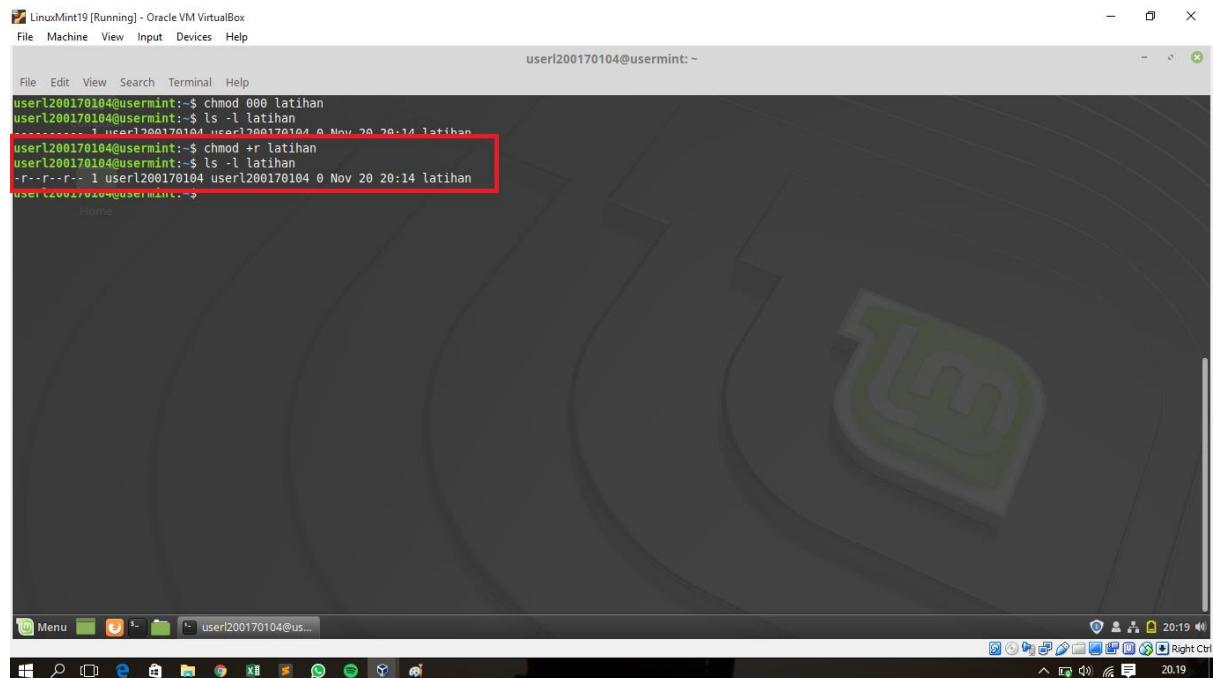
## Praktikum 3

### 1. Tidak memberikan hak akses



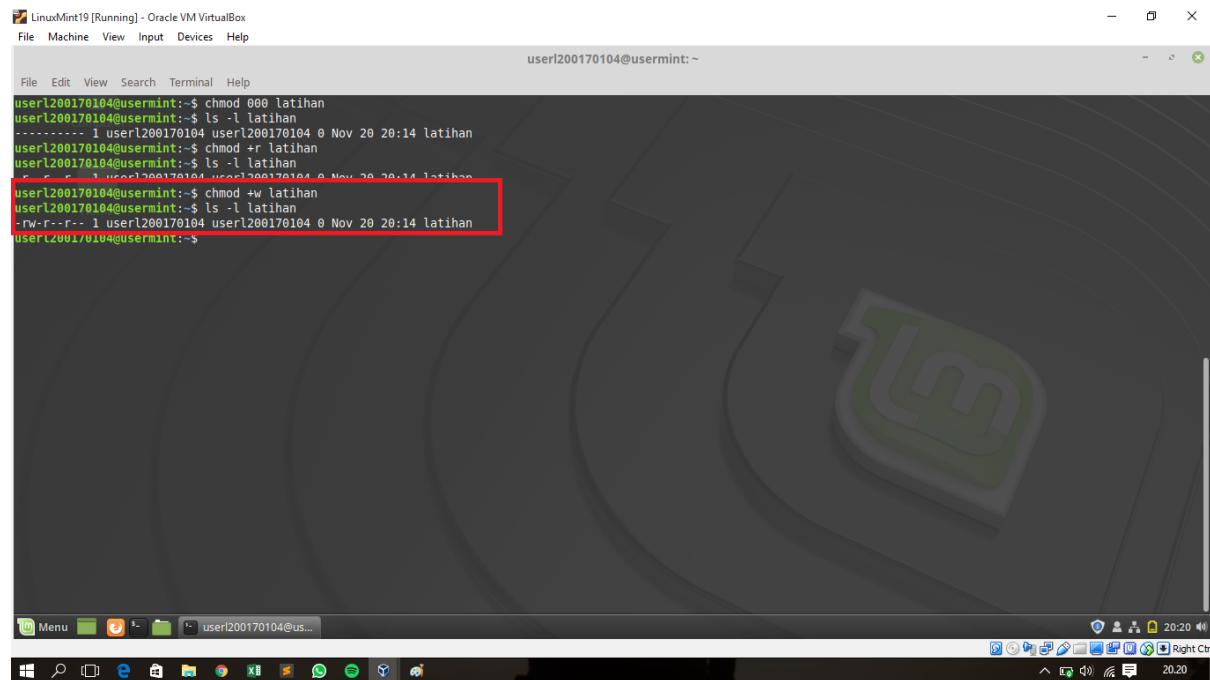
LinuxMint19 [Running] - Oracle VM VirtualBox  
File Machine View Input Devices Help  
user200170104@usermint: ~  
File Edit View Search Terminal Help  
user200170104@usermint:~\$ chmod 000 latihan  
user200170104@usermint:~\$ ls -l latihan  
----- 1 user200170104 user200170104 0 Nov 20 20:14 latihan  
user200170104@usermint:~\$

### 2. Menambah hak akses read



LinuxMint19 [Running] - Oracle VM VirtualBox  
File Machine View Input Devices Help  
user200170104@usermint: ~  
File Edit View Search Terminal Help  
user200170104@usermint:~\$ chmod 000 latihan  
user200170104@usermint:~\$ ls -l latihan  
----- 1 user200170104 user200170104 0 Nov 20 20:14 latihan  
user200170104@usermint:~\$ chmod +r latihan  
user200170104@usermint:~\$ ls -l latihan  
r--r--r-- 1 user200170104 user200170104 0 Nov 20 20:14 latihan  
user200170104@usermint:~\$

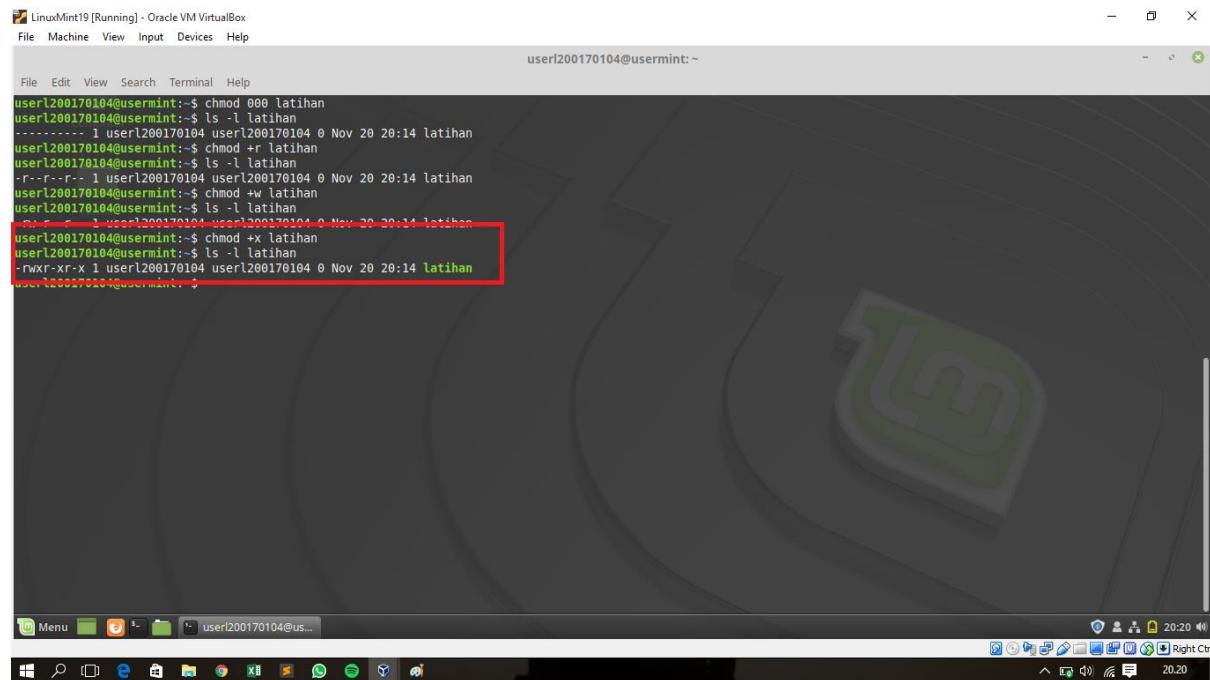
### 3. Menambahkan hak akses write



```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

```
File Edit View Search Terminal Help
user1200170104@usermint:~$ chmod 000 latihan
user1200170104@usermint:~$ ls -l latihan
----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +r latihan
user1200170104@usermint:~$ ls -l latihan
-r--r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +w latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$
```

### 4. Menambahkan hak akses execute



```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

```
File Edit View Search Terminal Help
user1200170104@usermint:~$ chmod 000 latihan
user1200170104@usermint:~$ ls -l latihan
----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +r latihan
user1200170104@usermint:~$ ls -l latihan
-r--r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +w latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +x latihan
user1200170104@usermint:~$ ls -l latihan
-rwxr-xr-x 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$
```

## 5. Menghilangkan hak akses execute

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

```
user1200170104@usermint:~$ chmod 000 latihan
user1200170104@usermint:~$ ls -l latihan
----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +r latihan
user1200170104@usermint:~$ ls -l latihan
-r--r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +w latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +x latihan
user1200170104@usermint:~$ ls -l latihan
-rwxr--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod -x latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$
```

The terminal window shows the user running several commands to change the file permissions of 'latihan'. First, they run 'chmod 000 latihan', which sets all permissions (execute, write, and read) to off. Then, they run 'chmod +r latihan', which adds read permission. Next, they run 'chmod +w latihan', which adds write permission. Finally, they run 'chmod +x latihan', which adds execute permission. After each command, they use 'ls -l latihan' to list the file's permissions again. The last command, 'chmod -x latihan', removes the execute permission, resulting in the final output where only read and write permissions remain.

## 6. Menghilangkan hak akses write

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

```
user1200170104@usermint:~$ chmod 000 latihan
user1200170104@usermint:~$ ls -l latihan
----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +r latihan
user1200170104@usermint:~$ ls -l latihan
-r--r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +w latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +x latihan
user1200170104@usermint:~$ ls -l latihan
-rwxr--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod -x latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod -w latihan
user1200170104@usermint:~$ ls -l latihan
-r--r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$
```

The terminal window shows the user running several commands to change the file permissions of 'latihan'. First, they run 'chmod 000 latihan', which sets all permissions (execute, write, and read) to off. Then, they run 'chmod +r latihan', which adds read permission. Next, they run 'chmod +w latihan', which adds write permission. Finally, they run 'chmod +x latihan', which adds execute permission. After each command, they use 'ls -l latihan' to list the file's permissions again. The last command, 'chmod -w latihan', removes the write permission, resulting in the final output where only read and execute permissions remain.

## 7. Menghilangkan hak akses read

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

```
File Edit View Search Terminal Help
user1200170104@usermint:~$ chmod 000 latihan
user1200170104@usermint:~$ ls -l latihan
----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +r latihan
user1200170104@usermint:~$ ls -l latihan
-r--r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +w latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod +x latihan
user1200170104@usermint:~$ ls -l latihan
-rwxr-xr-x 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod -x latihan
user1200170104@usermint:~$ ls -l latihan
-rw-r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod -w latihan
user1200170104@usermint:~$ ls -l latihan
-r--r--r-- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$ chmod -r latihan
user1200170104@usermint:~$ ls -l latihan
----- 1 user1200170104 user1200170104 0 Nov 20 20:14 latihan
user1200170104@usermint:~$
```

The terminal window shows the user navigating through directory permissions for a file named 'latihan'. The user first changes the permissions to 000, then adds read, write, and execute permissions. After that, they remove the read permission, leaving only the execute permission. Finally, they remove all permissions, leaving the file as a regular file with no permissions.

## Praktikum 4

### 1. Masuk ke bin

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
user1200170104@usermint:~
```

```
File Edit View Search Terminal Help
user1200170104@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# usermod -aG sudo user1200170104
root@usermint:/home/usermint# su user1200170104
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
root@usermint:/home/usermint$ cd /bin
```

The terminal window shows the user switching to root using 'sudo su'. They then run 'usermod -aG sudo user1200170104' to add the user to the sudo group. Finally, they change their working directory to '/bin' using 'cd /bin'.

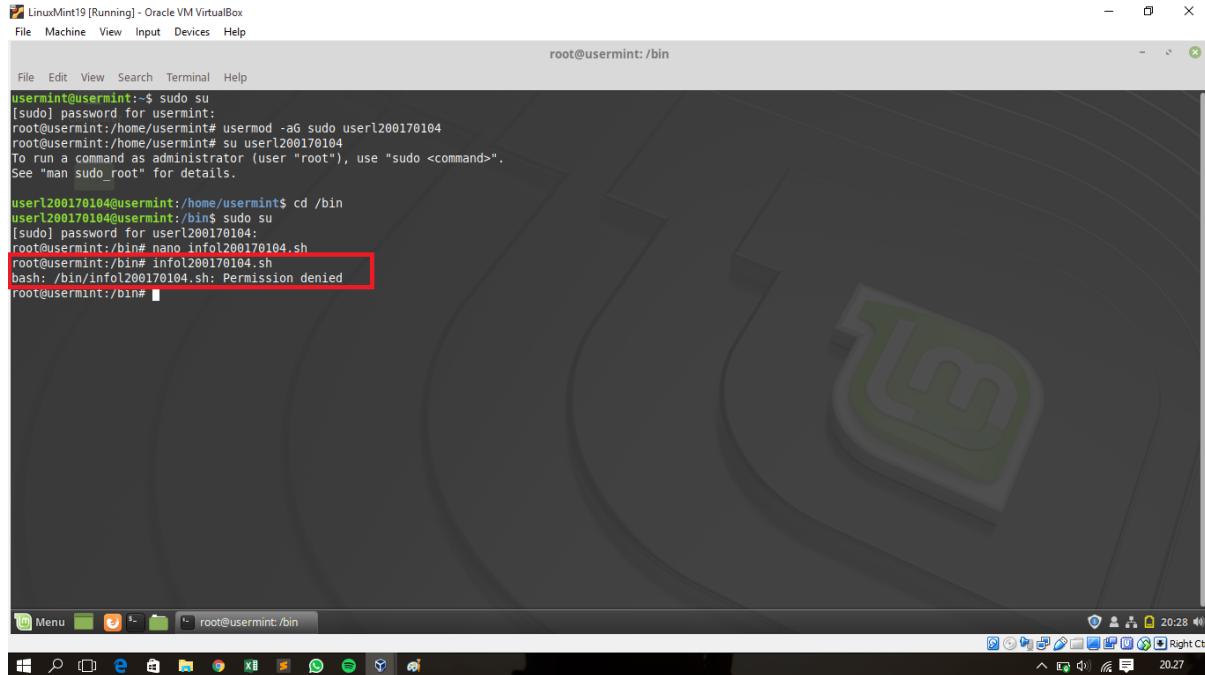
## 2. Membuat file dan sekaligus ketik isi

```
username@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# usermod -aG sudo userl200170104
root@usermint:/home/usermint# su userl200170104
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

userl200170104@usermint:/home/usermint$ cd /bin
userl200170104@usermint:/bin$ sudo su
[sudo] password for userl200170104:
root@usermint:/bin# nano infol200170104.sh
root@usermint:/bin#
```

```
root@usermint:~/bin
File Edit View Search Terminal Help
GNU nano 2.9.3
infol200170104.sh
Modified
#!/bin/sh
WAKTU "Tanggal dan jam saat ini: `date`"
JMLUSER "Jumlah user: `wc -l`"
AKU "Status personal: `echo -e "\$SWAKTU" | wc -l`"
echo -e "$WAKTU"
echo -e "$JMLUSER"
echo -e "$AKU"
whoami
exit 0
```

### 3. Masukkan perintah logininfo.sh



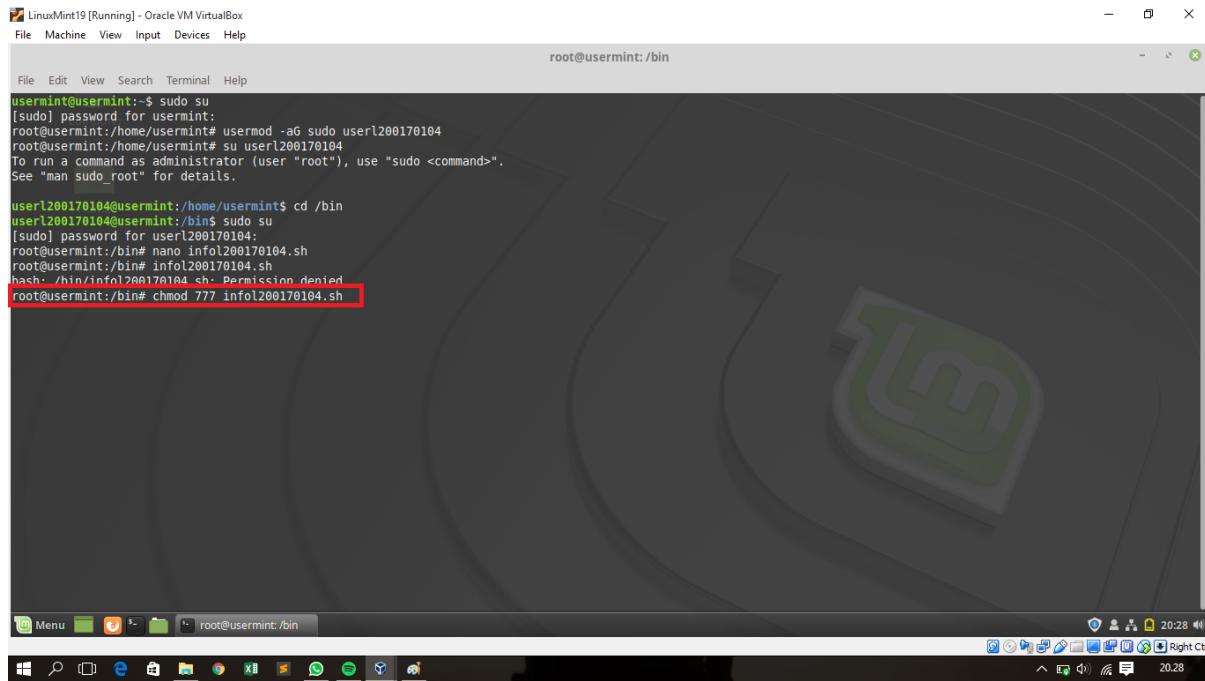
A screenshot of a Linux Mint terminal window titled "LinuxMint19 [Running] - Oracle VM VirtualBox". The terminal shows the following command sequence:

```
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# usermod -aG sudo userl200170104
root@usermint:/home/usermint# su userl200170104
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

userl200170104@usermint:/home/usermint$ cd /bin
userl200170104@usermint:/bin$ sudo su
[sudo] password for userl200170104:
root@usermint:/bin# nano info1200170104.sh
root@usermint:/bin# info1200170104.sh
bash: /bin/info1200170104.sh: Permission denied
root@usermint:/bin#
```

The line "bash: /bin/info1200170104.sh: Permission denied" is highlighted with a red box.

### 5. Ubah hak akses



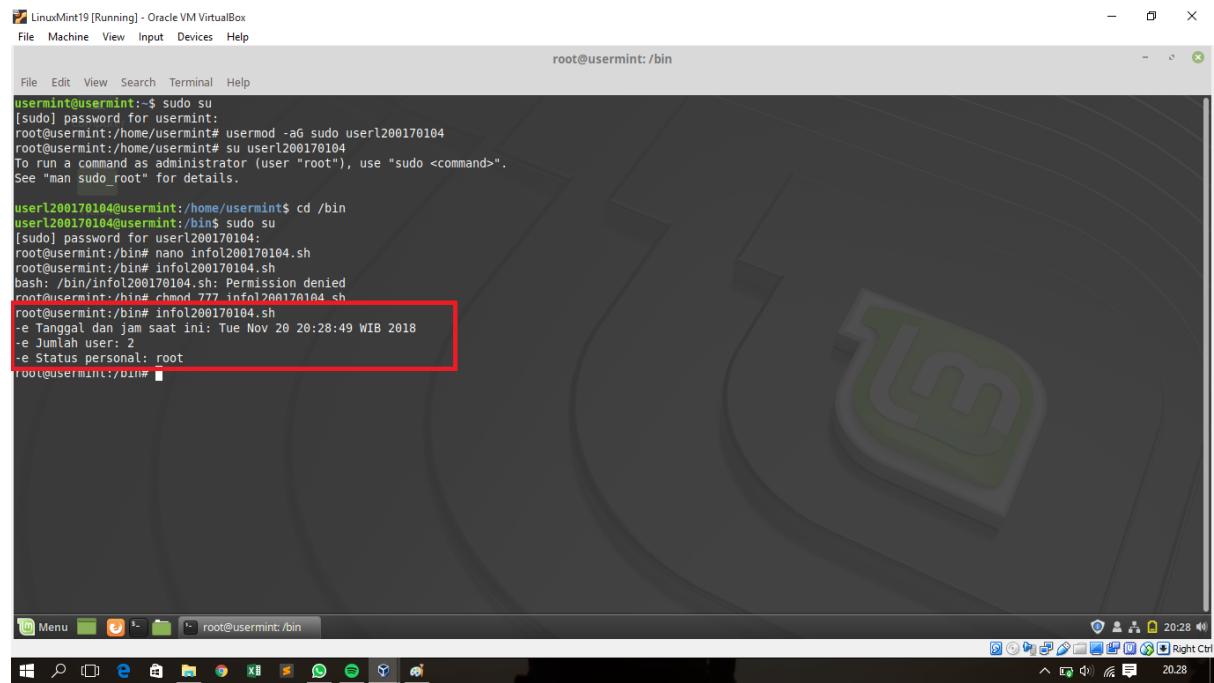
A screenshot of a Linux Mint terminal window titled "LinuxMint19 [Running] - Oracle VM VirtualBox". The terminal shows the following command sequence:

```
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# usermod -aG sudo userl200170104
root@usermint:/home/usermint# su userl200170104
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

userl200170104@usermint:/home/usermint$ cd /bin
userl200170104@usermint:/bin$ sudo su
[sudo] password for userl200170104:
root@usermint:/bin# nano info1200170104.sh
root@usermint:/bin# info1200170104.sh
bash: /bin/info1200170104.sh: Permission denied
root@usermint:/bin# chmod 777 info1200170104.sh
```

The line "bash: /bin/info1200170104.sh: Permission denied" is highlighted with a red box.

## 6. Hasilnya



The screenshot shows a terminal window titled "root@usermint: /bin" running on a Linux Mint 19 desktop environment. The terminal output is as follows:

```
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# usermod -aG sudo userl200170104
root@usermint:/home/usermint# su userl200170104
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

userl200170104@usermint:~/bin$ cd /bin
userl200170104@usermint:/bin$ sudo su
[sudo] password for userl200170104:
root@usermint:/bin# nano info1200170104.sh
root@usermint:/bin# info1200170104.sh
bash: /bin/info1200170104.sh: Permission denied
root@usermint:/bin# chmod 777 info1200170104.sh
root@usermint:/bin# info1200170104.sh
-e Tanggal dan jam saat ini: Tue Nov 20 20:28:49 WIB 2018
-e Jumlah user: 2
-e Status personal: root
root@usermint:/bin#
```

A red box highlights the command "chmod 777 info1200170104.sh" and its output, which shows the file has been successfully modified to be executable by all users.

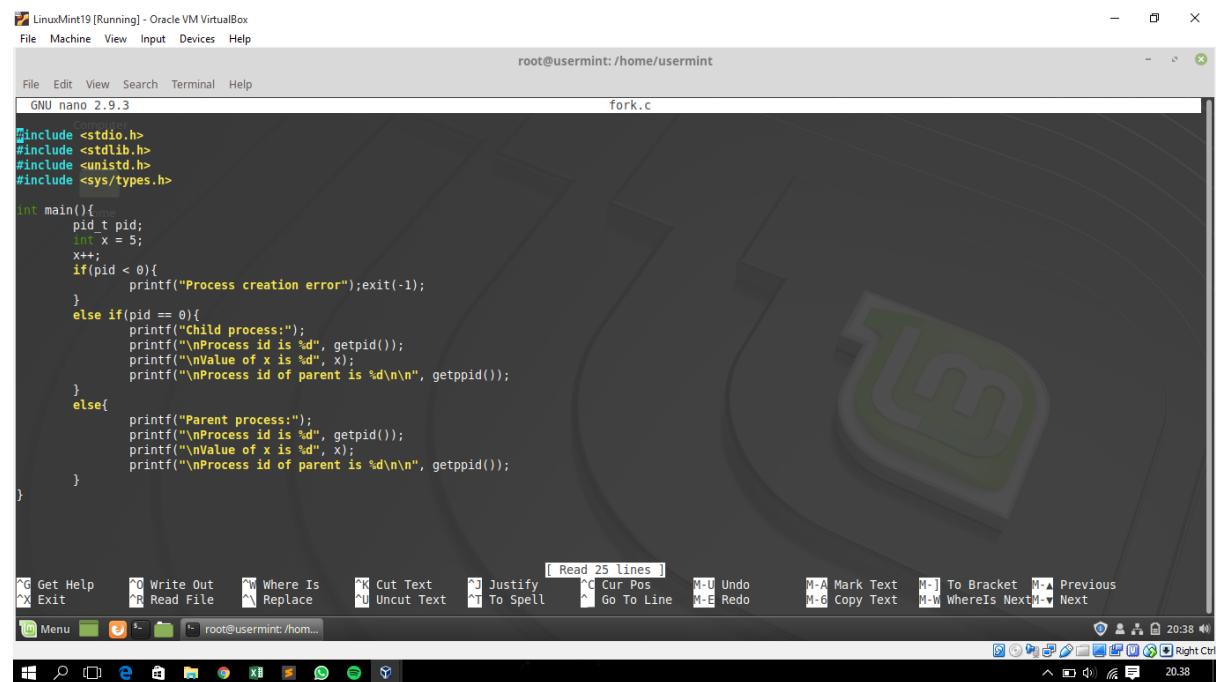
## Laporan 8

Nama : M. Khoiruddin

NIM : L200170104

Kelas : E

### Fork.c



The screenshot shows a terminal window titled "root@usermint: /home/usermint" running on a Linux Mint 19 desktop environment. The window contains the C code for a program named "fork.c". The code includes headers for stdio.h, stdlib.h, unistd.h, and sys/types.h. It defines a main function that initializes a pid\_t variable to 0, sets an integer x to 5, increments x, and then checks if pid is less than 0. If true, it prints a process creation error and exits. Otherwise, it prints the current process ID, the value of x, and the parent's process ID. The terminal window has a standard nano 2.9.3 interface with various keyboard shortcuts at the bottom.

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.h>

int main(){
    pid_t pid;
    int x = 5;
    x++;
    if(pid < 0){
        printf("Process creation error");exit(-1);
    }
    else if(pid == 0){
        printf("\nChild process:");
        printf("\nProcess id is %d", getpid());
        printf("\nValue of x is %d", x);
        printf("\nProcess id of parent is %d\n\n", getppid());
    }
    else{
        printf("Parent process:");
        printf("\nProcess id is %d", getpid());
        printf("\nValue of x is %d", x);
        printf("\nProcess id of parent is %d\n\n", getppid());
    }
}
```

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
root@usermint:/home/usermint#
root@usermint: /home/usermint#
File Edit View Search Terminal Help
root@usermint:/home/usermint# nano fork.c
Use "fg" to return to nano.
[1]+ Stopped nano fork.c
root@usermint:/home/usermint# nano fork.c
root@usermint:/home/usermint# gcc fork.c -o fork
root@usermint:/home/usermint# nano fork.c
root@usermint:/home/usermint# gcc fork.c -o fork
root@usermint:/home/usermint#
```

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
root@usermint:/home/usermint#
root@usermint: /home/usermint#
File Edit View Search Terminal Help
root@usermint:/home/usermint# nano fork.c
Use "fg" to return to nano.
[1]+ Stopped nano fork.c
root@usermint:/home/usermint# nano fork.c
root@usermint:/home/usermint# gcc fork.c -o fork
root@usermint:/home/usermint# nano fork.c
root@usermint:/home/usermint# gcc fork.c -o fork
root@usermint:/home/usermint# ./fork
Parent process:
Process id is 3026
Value of x is 6
Process id of parent is 1436
root@usermint:/home/usermint#
```

## Wait.c

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

GNU nano 2.9.3

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

int main(){
    int i, status;
    pid_t pid;
    pid = fork();

    if(pid < 0){
        printf("Pembuatan proses gagal");
        exit(-1);
    }
    else if(pid > 0){
        wait(NULL);
        printf("\nParent starts\nNomor Genap:");
        for(i=2;i<10;i+=2)
            printf("%d", i);
        printf("\nParent ends\n");
    }
    else if(pid == 0){
        printf("\nChild starts\nNomor Ganjil:");
        for(i=1;i<10;i+=2)
            printf("%d", i);
        printf("\nChild ends\n");
    }
}
```

^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^X Justify ^C Cur Pos M-U Undo M-A Mark Text M-J To Bracket M-A Previous  
^X Exit ^R Read File ^W Replace ^U Uncut Text ^T To Spell ^G Go To Line M-B Redo M-C Copy Text M-W WhereIs Next M-V Next

Menu root@usermint: /hom...

20:48

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

File Edit View Search Terminal Help

```
root@usermint:/home/usermint# nano fork.c
Use "fg" to return to nano.

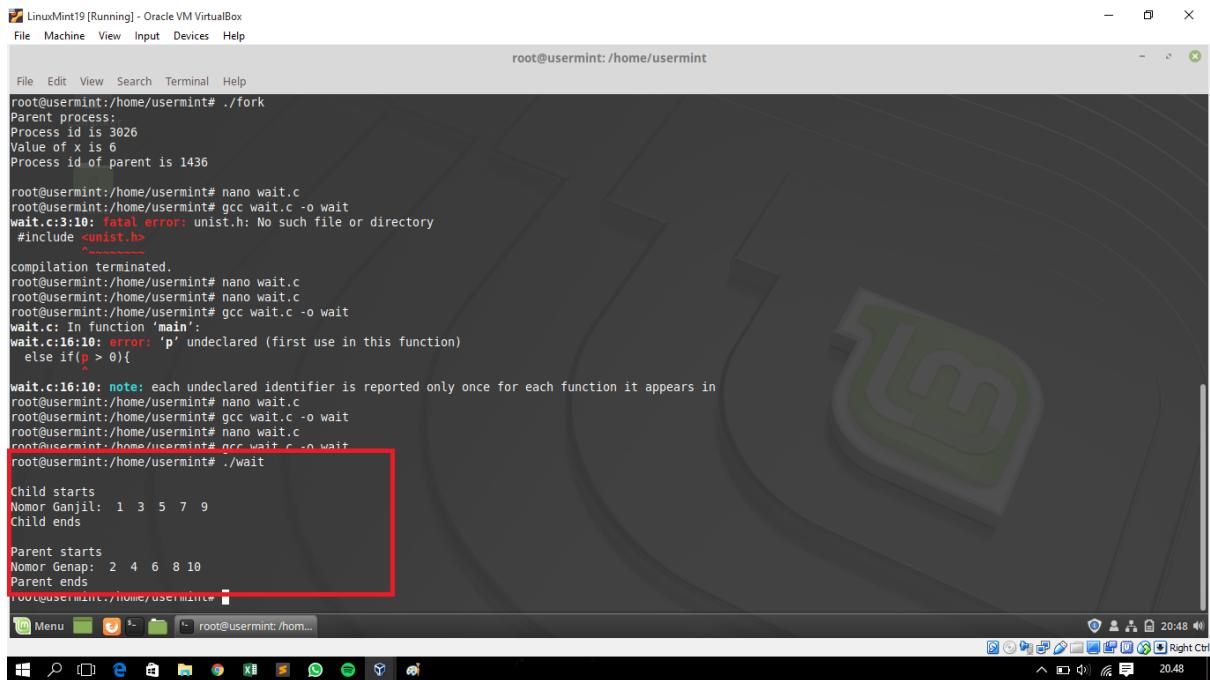
[1]+  Stopped                  nano fork.c
root@usermint:/home/usermint# nano fork.c
root@usermint:/home/usermint# gcc fork.c -o fork
root@usermint:/home/usermint# nano fork.c
root@usermint:/home/usermint# gcc fork.c -o fork
root@usermint:/home/usermint# ./fork
Parent process:
Process id is 3026
Value of x is 6
Process id of parent is 1436

root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
wait.c:3:10: fatal error: unistd.h: No such file or directory
 #include <unistd.h>
           ^
compilation terminated.
root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
wait.c: In function 'main':
wait.c:10: error: 'p' undeclared (first use in this function)
  else if(p > 0){

wait.c:10: note: each undeclared identifier is reported only once for each function it appears in
root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
root@usermint:/home/usermint#
```

root@usermint: /hom...

20:48



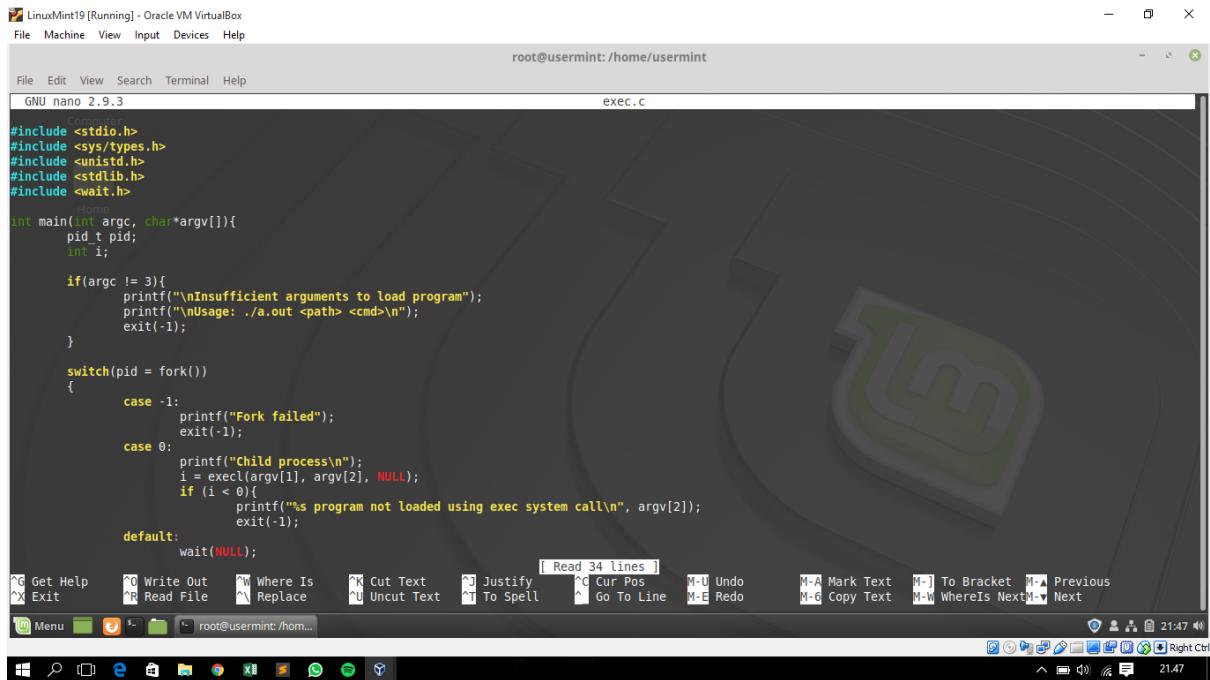
```
root@usermint:/home/usermint# ./fork
Parent process:
Process id is 3026
Value of x is 6
Process id of parent is 1436

root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
wait.c:3:10: fatal error: unistd.h: No such file or directory
 #include <unistd.h>
             ^
compilation terminated.
root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
wait.c: In function 'main':
wait.c:16:10: error: 'p' undeclared (first use in this function)
  else if(p > 0){
               ^
wait.c:16:10: note: each undeclared identifier is reported only once for each function it appears in
root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
root@usermint:/home/usermint# nano wait.c
root@usermint:/home/usermint# gcc wait.c -o wait
root@usermint:/home/usermint# ./wait

Child starts
Nomor Ganjil: 1 3 5 7 9
Child ends

Parent starts
Nomor Genap: 2 4 6 8 10
Parent ends
```

## Exec.c



```
root@usermint:/home/usermint# nano exec.c
exec.c
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>
#include <stdlib.h>
#include <wait.h>

Home
int main(int argc, char*argv[]){
    pid_t pid;
    int i;

    if(argc != 3){
        printf("\nInsufficient arguments to load program");
        printf("\nUsage: ./a.out <path> <cmd>\n");
        exit(-1);
    }

    switch(pid = fork())
    {
        case -1:
            printf("Fork failed");
            exit(-1);
        case 0:
            printf("Child process\n");
            i = exec(argv[1], argv[2], NULL);
            if (i < 0){
                printf("%s program not loaded using exec system call\n", argv[2]);
                exit(-1);
            }
        default:
            wait(NULL);
    }
}

[ Read 34 lines ]
^G Get Help ^C Write Out ^W Where Is ^X Cut Text ^J Justify ^C Cur Pos ^U Undo
^X Exit ^R Read File ^R Replace ^U Uncut Text ^I To Spell ^G Go To Line ^R Redo
^M-A Mark Text ^M-T To Bracket ^M-P Previous ^M-C Copy Text ^M-W Whereis Next ^M-N Next
```

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

GNU nano 2.9.3 exec.c

```
Computer
switch(pid = fork())
{
    case -1:
        printf("Fork failed");
        exit(-1);
    case 0:
        printf("Child process\n");
        i = exec(argv[1], argv[2], NULL);
        if (i < 0){
            printf("%s program not loaded using exec system call\n", argv[2]);
            exit(-1);
        }
    default:
        wait(NULL);
        printf("Child Terminated\n");
        exit(0);
}
}
```

Get Help Write Out Where Is Cut Text Justify Cur Pos Undo Mark Text To Bracket Previous
Exit Read File Replace Uncut Text To Spell Go To Line Redo Copy Text WhereIs Next Next

Menu 21:50

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

```
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# gcc exec.c -o exec
root@usermint:/home/usermint#
```

Home

Menu 21:50

The screenshot shows a terminal window titled "LinuxMint19 [Running] - Oracle VM VirtualBox". The terminal session is as follows:

```
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# gcc exec.c -o exec
root@usermint:/home/usermint# ./a.out /bin/ls
Child process
a.out Desktop dirlist.c Downloads exec.c fork.c Music Public stat.c Videos wait.c
cba.c dirlist Documents exec fork fork.c.save Pictures stat Templates wait
Child Terminated
root@usermint:/home/usermint#
```

The command `./a.out /bin/ls` was run, and its output was captured by a red box. The output shows a child process listing files in the current directory, including `a.out`, `Desktop`, `dirlist.c`, `Downloads`, `exec.c`, `fork.c`, `Music`, `Public`, `stat.c`, `Videos`, and `wait.c`. It also lists `coba.c`, `dirlist`, `Documents`, `exec`, `fork`, `fork.c.save`, `Pictures`, `stat`, `Templates`, and `wait`.

Stat.c

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

File Edit View Search Terminal Help

GNU nano 2.9.3 stat.c

```
Computer exit(-1);
}
printf("User id: %d\n", file.st_uid);
printf("Group id: %d\n", file.st_gid);
printf("Block size: %ld\n", file.st_blksize);
printf("Blocks Allocated: %ld\n", file.st_blocks);
printf("Inode no.: %ld\n", file.st_ino);
printf("Last Access: %s", ctime(&(file.st_atime)));
printf("Last Modified: %s", ctime(&(file.st_mtime)));
printf("File Size: %ld bytes\n", file.st_size);
printf("No. of links: %d\n", file.st_nlink);
printf("Permission");
printf( (S_ISDIR(file.st_mode)) ? "d" : "-");
printf( (file.st_mode & S_IRUSR) ? "+" : "-");
printf( (file.st_mode & S_IWUSR) ? "+" : "-");
printf( (file.st_mode & S_IXUSR) ? "x" : "-");
printf( (file.st_mode & S_IRGRP) ? "+" : "-");
printf( (file.st_mode & S_IWGRP) ? "w" : "-");
printf( (file.st_mode & S_IXGRP) ? "x" : "-");
printf( (file.st_mode & S_IROTH) ? "r" : "-");
printf( (file.st_mode & S_IWOTH) ? "w" : "-");
printf( (file.st_mode & S_IROTH) ? "x" : "-");
printf("\n");
if(file.st_mode & S_IFREG)
    printf("File type: Regular\n");
if(file.st_mode & S_IFDIR)
    printf("File type: Directory\n");
}
```

File Get Help Write Out Where Is Cut Text Justify Cur Pos Undo Mark Text To Bracket Previous Exit Read File Replace Uncut Text To Spell Go To Line Redo Copy Text WhereIs Next Next

root@usermint:/hom...

21:52

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

File Edit View Search Terminal Help

usermint@usermint:~\$ sudo su

[sudo] password for usermint:

root@usermint:/home/usermint# nano exec.c

root@usermint:/home/usermint# nano exec.c

root@usermint:/home/usermint# gcc exec.c -o exec

root@usermint:/home/usermint# ./a.out /bin/ls ls

Child process

a.out Desktop dirlist.c Downloads exec.c fork.c Music Public stat.c Videos wait.c

coba.c dirlist Documents exec fork fork.c.save Pictures stat Templates wait

Child Terminated

root@usermint:/home/usermint# nano stat.c

root@usermint:/home/usermint# gcc stat.c -o stat

root@usermint:~\$

File Get Help Write Out Where Is Cut Text Justify Cur Pos Undo Mark Text To Bracket Previous Exit Read File Replace Uncut Text To Spell Go To Line Redo Copy Text WhereIs Next Next

root@usermint:/hom...

21:53

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

```
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# gcc exec.c -o exec
root@usermint:/home/usermint# ./a.out /bin/ls ls
Child process
a.out Desktop dirlist.c Downloads exec.c fork.c      Music    Public stat.c  Videos wait.c
coba.c  dirlist Documents exec      fork fork.c.save Pictures stat    Templates wait
Child Terminated
root@usermint:/home/usermint# nano stat.c
root@usermint:/home/usermint# gcc stat.c -o stat
root@usermint:/home/usermint# ./stat
Usage: ./a.out <filename>
root@usermint:/home/usermint# ./a.out fork.c
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./a.out fork
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./a.out wait
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./stat
Usage: ./a.out <filename>
root@usermint:/home/usermint#
```

root@usermint: /home/usermint#

21:56

## Dirlist.c

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

```
File Edit View Search Terminal Help
GNU nano 2.9.3          dirlist.c
```

```
#include <stdio.h>
#include <dirent.h>
#include <stdlib.h>

int main(int argc, char *argv[]){
    struct dirent *dptr;
    DIR *dname;

    if(argc != 2){
        printf("Usage: ./a.out <dirname>\n");
        exit(-1);
    }
    if((dname = opendir(argv[1])) == NULL)
    {
        perror(argv[1]);
        exit(-1);
    }
    while(dptr=readdir(dname))
        printf("%s\n", dptr->d_name);

    closedir(dname);
}
```

[ Read 22 lines ]

Get Help Write Out Where Is Cut Text Justify Cur Pos Undo Mark Text To Bracket Previous  
Exit Read File Replace Uncut Text To Spell Go To Line Redo Copy Text Whereis Next Next

root@usermint: /home/usermint#

21:43

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
root@usermint:/home/usermint
File Edit View Search Terminal Help
exec.c:23:3: warning: missing sentinel in function call [-Wformat]
    i = execl(argv[1], argv[2], 0);
^
root@usermint:/home/usermint# g++ exec.c -std=c++11 -Wformat
root@usermint:/home/usermint# gcc exec.c -o exec
exec.c: In function 'main':
exec.c:23:3: warning: missing sentinel in function call [-Wformat]
    i = execl(argv[1], argv[2], 0);
^
root@usermint:/home/usermint# g++ exec.c -std=c++98 -Wformat
root@usermint:/home/usermint# gcc exec.c -o exec
exec.c: In function 'main':
exec.c:23:3: warning: missing sentinel in function call [-Wformat]
    i = execl(argv[1], argv[2], 0);
^
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# gcc exec.c -o exec
exec.c: In function 'main':
exec.c:23:3: warning: missing sentinel in function call [-Wformat]
    i = execl(argv[1], argv[2], 0);
^
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano dirlist.c
root@usermint:/home/usermint# gcc dirlist.c -o dirlist
dirlist.c:5:16: error: expected ')' before 'char'
int main(argc, char *argv[]){
      ^
root@usermint:/home/usermint# nano dirlist.c
root@usermint:/home/usermint# gcc dirlist.c -o dirlist
root@usermint:/home/usermint# gcc dirlist.c -o dirlist
root@usermint:/home/usermint#
```

```
LinuxMint19 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
root@usermint:/home/usermint
File Edit View Search Terminal Help
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint#
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# gcc exec.c -o exec
root@usermint:/home/usermint# ./a.out /bin/ls ls
Child process
a.out Desktop dirlist.c Downloads exec.c fork.c Music Public stat.c Videos wait.c
coba.c dirlist Documents exec fork fork.c.save Pictures stat Templates wait
Child Terminated
root@usermint:/home/usermint# nano stat.c
root@usermint:/home/usermint# gcc stat.c -o stat
root@usermint:/home/usermint# ./stat
Usage: ./a.out <filename>
root@usermint:/home/usermint# ./a.out fork.c
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./a.out fork
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./a.out wait
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./stat
Usage: ./a.out <filename>
root@usermint:/home/usermint# gcc dirlist.c -o dirlist
root@usermint:/home/usermint#
```

LinuxMint19 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@usermint: /home/usermint

```
usermint@usermint:~$ sudo su
[sudo] password for usermint:
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# nano exec.c
root@usermint:/home/usermint# gcc exec.c -o exec
root@usermint:/home/usermint# ./a.out /bin/ls ls
Child process
a.out Desktop dirlist.c Downloads exec.c fork.c      Music    Public stat.c  Videos wait.c
coba.c  dirlist Documents exec      fork   fork.c.save Pictures stat    Templates wait
Child Terminated
root@usermint:/home/usermint# nano stat.c
root@usermint:/home/usermint# gcc stat.c -o stat
root@usermint:/home/usermint# ./stat
Usage: ./a.out <filename>
root@usermint:/home/usermint# ./a.out fork.c
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./a.out fork
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./a.out wait
Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
root@usermint:/home/usermint# ./stat
Usage: ./a.out <filename>
root@usermint:/home/usermint# gcc dirlist.c -o dirlist
root@usermint:/home/usermint# ./dirlist
Usage: ./a.out <dirname>
root@usermint:/home/usermint#
```

root@usermint:/home/usermint#

21:57

Menu

Windows Taskbar icons

21:57

## Laporan 9

Nama : Muhammad Khoiruddin

NIM : L200170104

Kelas : E

### 1. Fcreate.c

```
#include <unistd.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <fcntl.h>

int main (int argc, char *argv[]){
    int fd, n, len;
    char buf[100];
if (argc != 2)
{
    printf("Usage: ./a.out <filename>\n");
    exit(-1);
}
fd = open(argv[1], O_WRONLY|O_CREAT|O_TRUNC, 0644);
if (fd < 0)
{
    printf("File creation problem\n");
    exit(-1);
}
printf("Tekan Ctrl+D di akhir baris\n");

while((n= read(0, buf, sizeof(buf)))>0)
{
    len = strlen(buf);
    write(fd, buf, len);
}

close(fd);
[ Read 30 lines ]
^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify  ^C Cur Pos
^X Exit  ^R Read File  ^P Replace  ^U Uncut Text  ^T To Spell  ^L Go To Line
```

### 2. Compile fcreate dengan gcc

```
usermint@usermint:~$ nano fcreate.c
usermint@usermint:~$ gcc -o fcreate fcreate.c
usermint@usermint:~$
```

3. Menamai fcreate.c test.txt

```
usermint@usermint:~$ nano fcreate.c
usermint@usermint:~$ gcc -o fcreate fcreate.c
usermint@usermint:~$ ./fcreate test.txt
Tekan Ctrl+D di akhir baris
Udin
usermint@usermint:~$
```

4. Fread.c

```
#include <unistd.h>
#include <stdio.h>
#include <stdlib.h>
#include <fcntl.h>

int main (int argc, char *argv[]){
    int fd,i;
    char buf[100];
    if (argc < 2)
    {
        printf("Usage: ./a.out <filename>\n");
        exit(-1);
    }
    fd = open (argv[1], O_RDONLY);
    if (fd == -1)
    {
        printf("%s file does not exist\n", argv[1]);
        exit(-1);
    }
    printf("isi dari file %s adalah : \n", argv[1]);
    while (read (fd, buf, sizeof(buf))>0)
        printf ("%s", buf);

    close(fd);
}
```

5. Mengompile fread.c dengan gcc

```
usermint@usermint:~$ nano fcreate.c
usermint@usermint:~$ gcc -o fcreate fcreate.c
usermint@usermint:~$ ./fcreate test.txt
Tekan Ctrl+D di akhir baris
Udin
usermint@usermint:~$ nano fread.c
usermint@usermint:~$ gcc -o fread fread.c
usermint@usermint:~$
```

6. Membaca isi fread.c

```
usermint@usermint:~$ nano fcreate.c
usermint@usermint:~$ gcc -o fcreate fcreate.c
usermint@usermint:~$ ./fcreate test.txt
Tekan Ctrl+D di akhir baris
Udin
usermint@usermint:~$ nano fread.c
usermint@usermint:~$ gcc -o fread fread.c
usermint@usermint:~$ ./fread test.txt
isi dari file test.txt adalah :
Udin
din@usermint@usermint:~$
```

7. Fapped.c

```
#include <unistd.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <fcntl.h>

int main (int argc, char *argv[]){
    int fd, n, len;
    char buf[100];
    if (argc != 2)
    {
        printf("Usage: ./a.out <filename>\n");
        exit(-1);
    }
    fd = open (argv[1], O_APPEND|O_WRONLY|O_CREAT, 0644);
    if (fd < 0)
    {
        perror(argv[1]);
        exit(-1);
    }
    while ((n=read(0, buf, sizeof(buf)))>0)
    {
        len=strlen(buf);
        write(fd, buf, len);
    }
    close(fd);
}
```

8. Mengompil fappend.c

```
usermint@usermint:~$ nano fcreate.c
usermint@usermint:~$ gcc -o fcreate fcreate.c
usermint@usermint:~$ ./fcreate test.txt
Tekan Ctrl+D di akhir baris
Udin
usermint@usermint:~$ nano fread.c
usermint@usermint:~$ gcc -o fread fread.c
usermint@usermint:~$ ./fread test.txt
isi dari file test.txt adalah :
Udin
din@usermint@usermint:~$ nano fappend.c
usermint@usermint:~$ gcc -o fappend fappend.c
usermint@usermint:~$
```

9. Menambah isi

```
usermint@usermint:~$ nano fcreate.c
usermint@usermint:~$ gcc -o fcreate fcreate.c
usermint@usermint:~$ ./fcreate test.txt
Tekan Ctrl+D di akhir baris
Udin
usermint@usermint:~$ nano fread.c
usermint@usermint:~$ gcc -o fread fread.c
usermint@usermint:~$ ./fread test.txt
isi dari file test.txt adalah :
Udin
usermint@usermint:~$ nano fappend.c
usermint@usermint:~$ gcc -o fappend fappend.c
usermint@usermint:~$ ./fappend test.txt
L200170104
usermint@usermint:~$
```

10. Hasil

```
usermint@usermint:~$ nano fcreate.c
usermint@usermint:~$ gcc -o fcreate fcreate.c
usermint@usermint:~$ ./fcreate test.txt
Tekan Ctrl+D di akhir baris
Udin
usermint@usermint:~$ nano fread.c
usermint@usermint:~$ gcc -o fread fread.c
usermint@usermint:~$ ./fread test.txt
isi dari file test.txt adalah :
Udin
usermint@usermint:~$ nano fappend.c
usermint@usermint:~$ gcc -o fappend fappend.c
usermint@usermint:~$ ./fappend test.txt
L200170104
usermint@usermint:~$ ./fread test.txt
isi dari file test.txt adalah :
Udin
usermint@usermint:~$ L200170104
$& usermint@usermint:~$
```

## Laporan 10

Nama : Muhammad Khoiruddin

NIM : L200170104

Kelas : E

### 1. List.c

```
GNU nano 2.9.3                                         list.c

#include <stdio.h>
#include <dirent.h>
int main(){
    struct dirent
        **namelist; int n, i;
    char pathname[100];
    getcwd(pathname);

    n = scandir(pathname, &namelist, 0, alphasort);
    if (n<0)
        printf("Error\n");
    else
        for (i=0;i<n; i++)if (namelist[i]->d_name[0] != '.')
            printf("%-20s", namelist[i]->d_name);
}
```

Compile dengan gcc

```
usermint@usermint:~$ gcc list.c -o list
list.c: In function 'main':
list.c:7:2: warning: implicit declaration of function 'getcwd'; did you mean 'getw'? [-Wimplicit-function-declaration]
    getcwd(pathname);
    ^
    getw
usermint@usermint:~$
```

Output dari list.c

```
usermint@usermint:~$ ls
copy  del.c  Documents  fappend  fcreate  fread  list  Music  mygrep.c  Public  test.txt
copy.c Desktop  Downloads  fappend.c  fcreate.c  fread.c  list.c  mygrep  Pictures  Templates  Videos
usermint@usermint:~$ ./list
Desktop          Documents          Downloads          Music          Pictures          Public          Templates          Videos
copy             copy.c             del.c             fappend         fappend.c        fcreate        fcreate.c        fread
fread.c          list              list.c            mygrep          mygrep.c        test.txt
usermint@usermint:~$
```

### 2. Mygrep.c

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
int main(int argc, char *argv[]){
    FILE*fd;
    char str[100];
    char c;
    int i, flag, j, m, k;
    char temp[30];

    if(argc != 3)
    {
        printf("Usage: gcc mygrep.c -o mygrep\n");
        printf("Usage: ./mygrep <search_text><filename>\n");
        exit(-1);
    }

    fd=fopen(argv[2],"r");
    if(fd == NULL)
    {
        printf("%s is not exist\n",argv[2]);
        exit(-1);
    }

    while(!feof(fd))
    {
        i=0;
        while(1)
```

```

compilator
while(1)
{
    c=fgetc(fd);
    if(feof(fd))
    {
        str[i++]='\0'; break;
    }
    if(c=='\n')
    {
        str[i++]='\0'; break;
    }
    str[i++]=c;
}
if(strlen(str)>= strlen(argv[1]))
for(k=0; k<=strlen(str)-strlen(argv[1]); k++)
{
    for(m=0; m<strlen(argv[1]); m++)
        temp[m]=str[k+m];
    temp[m]='\0';
    if(strcmp(temp, argv[1])==0)
    {
        printf("%s\n",str);
        break;
    }
}
}
}

```

Compile dengan gcc

```

usermint@usermint:~$ gcc list.c -o list
list.c: In function 'main':
list.c:7:2: warning: implicit declaration of function 'getcwd'; did you mean 'getw'? [-Wimplicit-function-declaration]
    getcwd(pathname);
^
    getw
usermint@usermint:~$ gcc mygrep.c -o mygrep
usermint@usermint:~$
```

### 3. Copy.c

```

GNU nano 2.9.3                               copy.c
#include <stdio.h>
#include <stdlib.h>
#include <fcntl.h>
#include <sys/stat.h>
#define SIZE 1024
int main (int argc, char *argv[])
{
    int src, dst, nread;
    char buf[SIZE];
    if (argc != 3)
    {
        printf("Usage: gcc copy.c -o copy\n");
        printf("Usage: ./copy <filename> <newfile>\n");
        exit(-1);
    }
    if ((src = open(argv[1], O_RDONLY)) == -1)
    {
        perror(argv[1]);
        exit(-1);
    }
    if ((dst = creat(argv[2], 0644)) == -1)
    {
        perror(argv[1]);
        exit(-1);
    }
    while ((nread = read(src, buf, SIZE)) > 0)
    {
        if (write(dst, buf, nread) == -1)
        {
            if ((src = open(argv[1], O_RDONLY)) == -1)
            {
                perror(argv[1]);
                exit(-1);
            }
            if ((dst = creat(argv[2], 0644)) == -1)
            {
                perror(argv[1]);
                exit(-1);
            }
            while ((nread = read(src, buf, SIZE)) > 0)
            {
                if (write(dst, buf, nread) == -1)
                {
                    printf("can't write\n");
                    exit(-1);
                }
            }
            close(src);
            close(dst);
        }
    }
}

```

## Compile dengan gcc

```
usermint@usermint:~$ gcc list.c -o list
list.c: In function 'main':
list.c:7:2: warning: implicit declaration of function 'getcwd'; did you mean 'getw'? [-Wimplicit-function-declaration]
  getcwd(pathname);
  ^
  getw
usermint@usermint:~$ gcc mygrep.c -o mygrep
usermint@usermint:~$ gcc copy.c -o copy
copy.c: In function 'main':
copy.c:25:18: warning: implicit declaration of function 'read'; did you mean 'fread'? [-Wimplicit-function-declaration]
  while ((read = read(src, buf, SIZE))>0)
  ^
  fread
copy.c:27:7: warning: implicit declaration of function 'write'; did you mean 'fwrite'? [-Wimplicit-function-declaration]
  if (write(dst, buf, nread)== -1)
  ^
  fwrite
copy.c:33:2: warning: implicit declaration of function 'close'; did you mean 'pclose'? [-Wimplicit-function-declaration]
  close(src);
  ^
  pclose
usermint@usermint:~$
```

## 4. Del.c

```
GNU nano 2.9.3                                     del.c

#include <stdio.h>
#include <stdlib.h>
#include <fcntl.h>
int main (int argc, char *argv[]){
    int fd;
    if (argc != 2)
    {
        printf("Usage: gcc del.c -o del\n");
        printf("Usage: ./de;<filename>\n");
        exit(-1);
    }
    fd = open(argv[1], O_RDONLY);
    if(fd != -1)
    {
        close(fd);
        inlink(argv[1]);
    } else
        perror(argv[1]);
}
```

## Compile dengan gcc

```
usermint@usermint:~$ gcc del.c -o del
del.c: In function 'main':
del.c:15:3: warning: implicit declaration of function 'close'; did you mean 'pclose'? [-Wimplicit-function-declaration]
  close(fd);
  ^
  pclose
del.c:16:3: warning: implicit declaration of function 'inlink' [-Wimplicit-function-declaration]
  inlink(argv[1]);
  ^
/tmp/ccuyzgMP.o: In function `main':
del.c:(.text+0x8d): undefined reference to `inlink'
collect2: error: ld returned 1 exit status
usermint@usermint:~$
```