

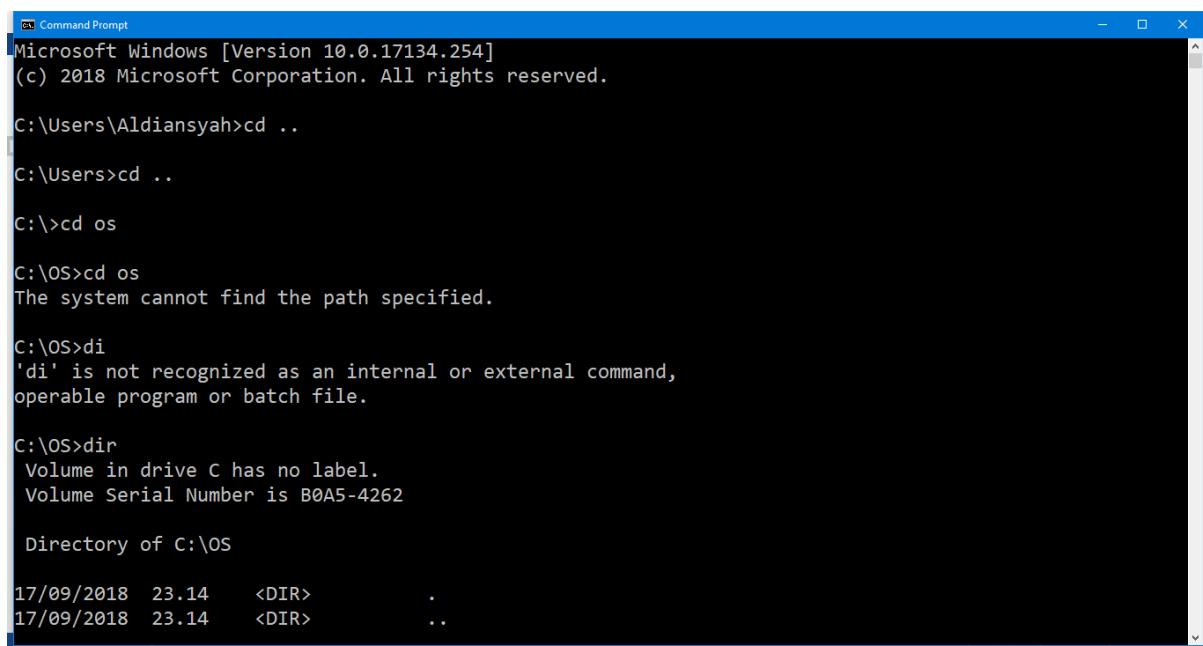
MODUL 1

Nama : Muhammad Izzuddin

NIM : L200170025

Kelas : B

1. Pindah direktori



```
Microsoft Windows [Version 10.0.17134.254]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Aldiansyah>cd ..
C:\Users>cd ..
C:\>cd os
C:\OS>cd os
The system cannot find the path specified.

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

C:\OS>dir
Volume in drive C has no label.
Volume Serial Number is B0A5-4262

Directory of C:\OS

17/09/2018  23.14      <DIR>        .
17/09/2018  23.14      <DIR>        ..
```

2. Menampilkan isi dari direktori C:/OS

3. Untuk melanjutkan praktikum harus menjalankan program setpath

```
C:\OS>dir
Volume in drive C has no label.
Volume Serial Number is B0A5-4262

Directory of C:\OS

17/09/2018 23.14 <DIR> .
17/09/2018 23.14 <DIR> ..
20/09/2017 15.23 <DIR> Bochs-2.3.5
12/09/2016 05.33 0 bximage
20/09/2017 15.23 <DIR> Dev-Cpp
17/12/2008 07.08 1.096.291 i386.pdf
20/09/2017 15.24 <DIR> LAB
17/12/2008 07.07 846.920 pcasm-book.pdf
17/12/2008 08.44 86 Setpath.bat
13/12/2008 21.12 716.512 winima81.exe
      5 File(s)   2.659.809 bytes
      5 Dir(s)  25.497.645.056 bytes free

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/lab1
```

4. Melihat isi sebuah file

```
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 0x0B40
```

```
C:\OS\LAB\LAB1>notepad boot.asm
C:\OS\LAB\LAB1>
```

5. Menampilkan suatu direktori dalam bentuk file

C:\OS\LAB\LAB1>notepad boot.asm
C:\OS\LAB\LAB1>notepad boot.asm
C:\OS\LAB\LAB1>notepad Makefile

C:\OS\LAB\LAB1>

Makefile - Notepad

```
# 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
```

6. Menjalankan program “make fp.disk” untuk melakukan kompilasi terhadap source code program “boot.asm”.

C:\OS\LAB\LAB1>notepad boot.asm
C:\OS\LAB\LAB1>notepad boot.asm
C:\OS\LAB\LAB1>notepad Makefile

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

7. Menghapus File floppya.img

```
OS Command Prompt

Press any key to continue

C:\OS\LAB\LAB1>del floppya.img

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
```

```
OS Command Prompt

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.

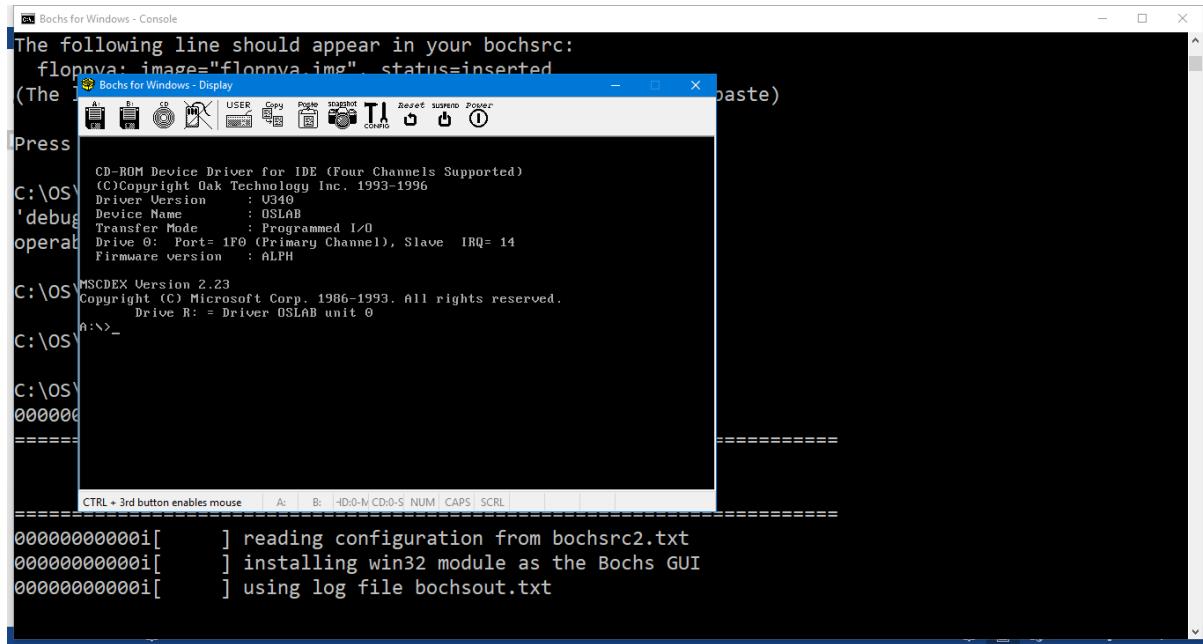
I wrote 1474560 bytes to floppya.img.

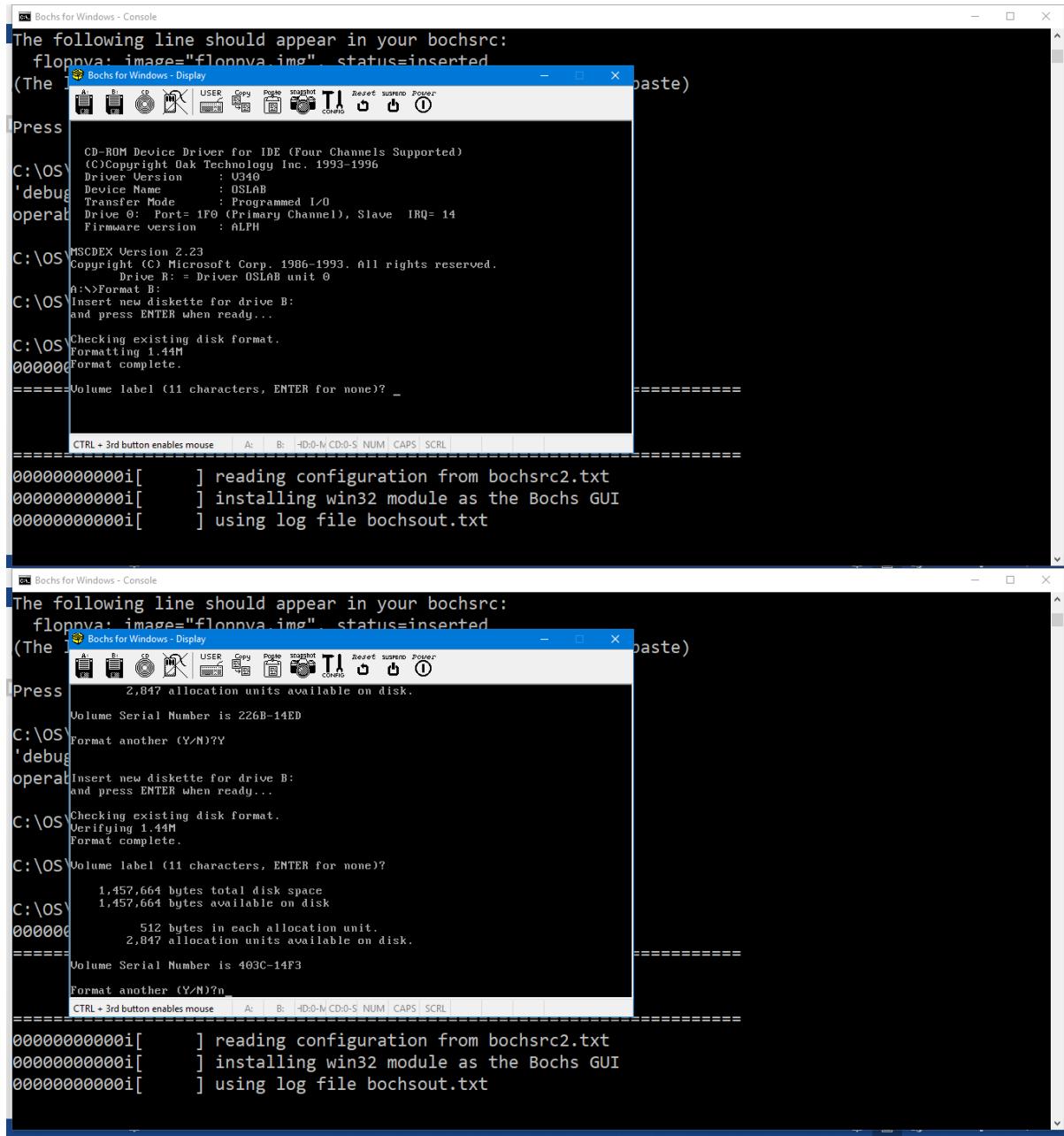
The following line should appear in your bochsrc:
floppya: image="floppya.img", status=inserted
(The line is stored in your windows clipboard, use CTRL-V to paste)

Press any key to continue

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

8. Menjalankan PC-Simulator





9. Menjalankan program “dd” dan kemudian menjalankan program debug namun gagal

```
Command Prompt
00000000000i[      ] reading configuration from bochssrc.bxrc
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] 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>dd if=floppya.img of=boots.bin count=1
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\LAB1>debug boots.bin
'debug' is not recognized as an internal or external command,
operable program or batch file.

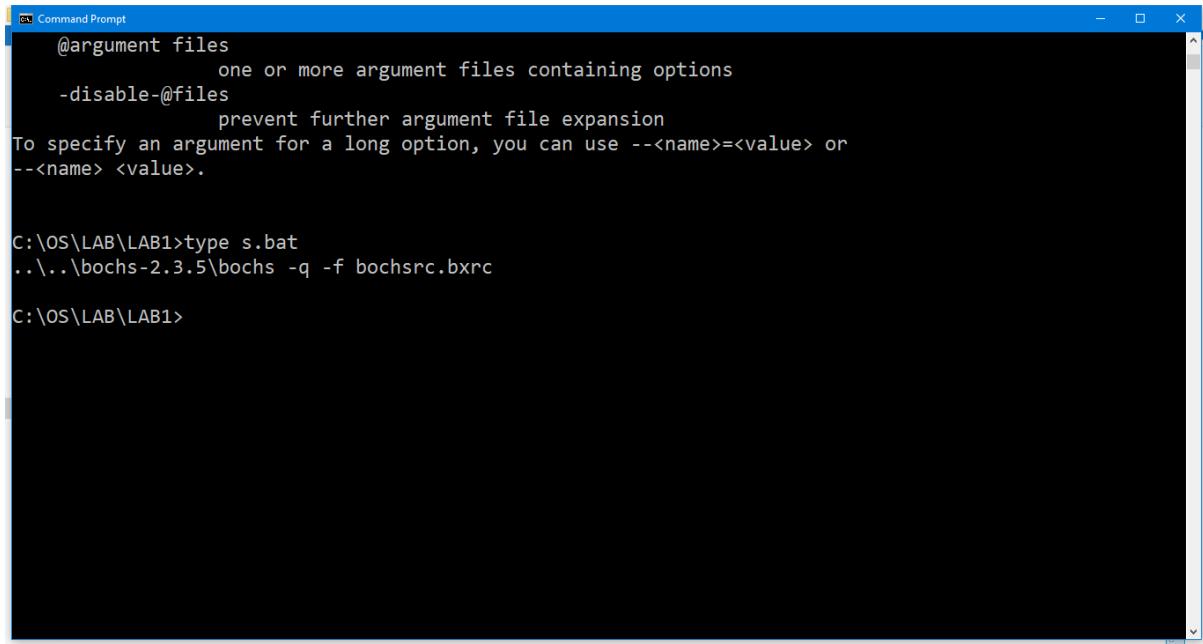
C:\OS\LAB\LAB1>
```

10. Menjalankan program “tdump” pada filr “boots.bin”

```
Command Prompt
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 29 F3 14 3C 40 4E 4F 20 4E 41 .....).<@NO NA
000030: 4D 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 0B FC F3 A4 06 U."~..N.....
000060: 1F BD 00 7C C6 45 FE 0F 38 4E 24 7D 20 8B C1 99 ...|.E..8N$} ...
000070: E8 7E 01 83 EB 3A 66 A1 1C 7C 66 3B 07 8A 57 FC .~...:f..|f;..W.
000080: 75 06 80 CA 02 88 56 02 80 C3 10 73 ED 33 C9 FE u.....V....s.3..
000090: 06 D8 7D 8A 46 10 98 F7 66 16 03 46 1C 13 56 1E ..}.F...F..V.
0000A0: 03 46 0E 13 D1 8B 76 11 60 89 46 FC 89 56 FE B8 .F....v.^..F..V..
0000B0: 20 00 F7 E6 8B 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 0B 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 D8 7D 7B A7 BE 7F 7D AC ;.r.....}{{...}.
0000F0: 98 03 F0 AC 98 40 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 .....}....}.....
000110: 5E 1F 66 8F 04 CD 19 BE 81 7D 8B 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 02 70 00 52 50 06 53 6A 01 6A 10 91 r....p.RP.Sj.j..
```

11. Melihat isi file “s.bat”

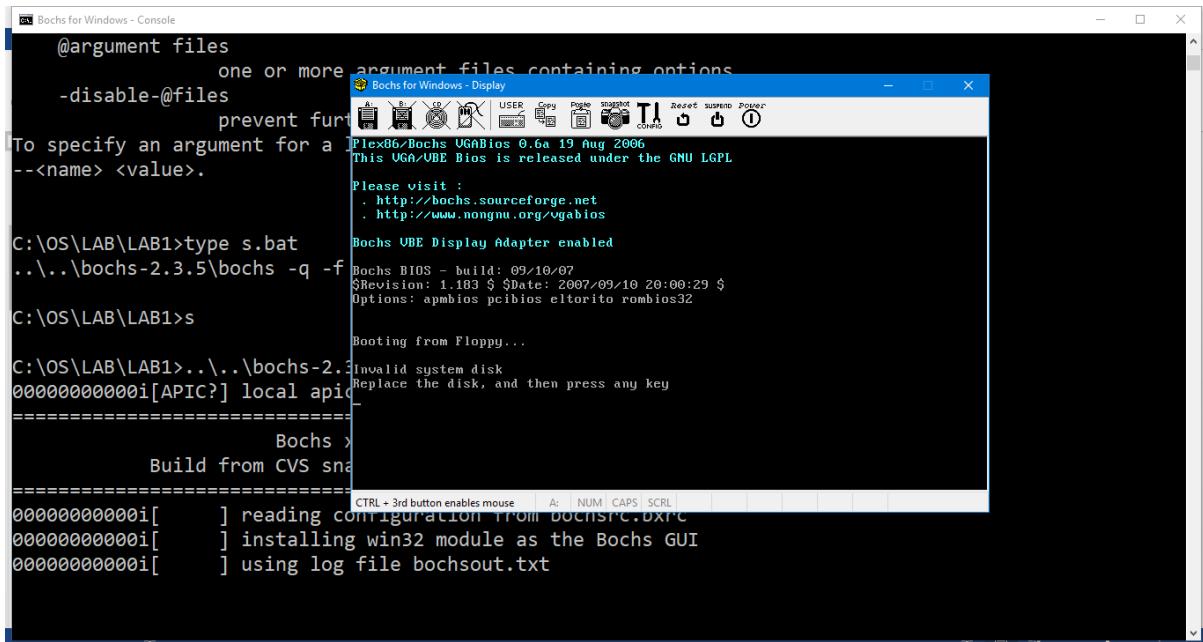


```
Command Prompt
@argument files
    one or more argument files containing options
-disable-@files
    prevent further argument file expansion
To specify an argument for a long option, you can use --<name>=<value> or
--<name> <value>.

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

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

12. Dengan menjalankan perintah “s” , sehingga menampilkan windows “Bochs for windows-display” seperti gambar dibawah ini



```
Bochs for Windows - Console
@argument files
    one or more argument files containing options
-disable-@files
    prevent further argument file expansion
To specify an argument for a long option, you can use --<name>=<value> or
--<name> <value>.

C:\OS\LAB\LAB1>type s.bat
...\\bochs-2.3.5\bochs -q -f
Bochs VBE Display Adapter enabled
Bochs BIOS - build: 09/10/07
$Revision: 1.183 $ $Date: 2007/09/10 20:00:29 $
Options: apmbios pcbios eltorito rombios32
C:\OS\LAB\LAB1>s
Booting from Floppy...
C:\OS\LAB\LAB1>...\\bochs-2.3.5\bochs -q -f
0000000000i[APIC?] local apic
=====
Bochs >
Build from CVS snapshot
=====
000000000000i[      ] reading configuration from bochsrc.bxrc
000000000000i[      ] installing win32 module as the Bochs GUI
000000000000i[      ] using log file bochsout.txt
```

13. Melakukan format pada direktori B:/s

```
Bochs for Windows - Console
Bochs for Windows - Display
CD-ROM Device Driver for IDE (Four Channels Supported)
(C)Copyright Oak Technology Inc. 1993-1996
Driver Version : U340
Device Name : OSLAB
Transfer Mode : Programmed I/O
Bochs Drive 0: Ports=1F0 (Primary Channel), Slave IRQ=14
[F] Firmware version : ALPH
[MS] MSCDEX Version 2.23
Copyright (C) Microsoft Corp. 1986-1993. All rights reserved.
Drive R: = Driver OSLAB unit 0
C:>Format B:/S
Insert new diskette for drive B:
and press ENTER when ready...
C:Checking existing disk format.
Verifying 1.44M
Format complete.
System transferred
C:Volume label (11 characters, ENTER for none)? _
```

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

Build from CVS snapshot, on September 16, 2007

```
00000000000i[      ] reading configuration from bochsrc2.txt
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] using log file bochsout.txt
```

14. Memeriksa apakah floppy pada drive “B:” terisi dengan “system file”. Sehingga tampilannya seperti dibawah ini.

```
Bochs for Windows - Console
Bochs for Windows - Display
Volume label (11 characters, ENTER for none)?
001,457,664 bytes total disk space
# 221,696 bytes used by system
1,235,968 bytes available on disk
== 512 bytes in each allocation unit.
Bochs 2,414 allocation units available on disk.
[V]olume Serial Number is 445B-1501
[=]Format another (Y/N)?n
```

C:>dir B:

Volume in drive B has no label
C: Volume Serial Number is 445B-1501
Directory of B:\

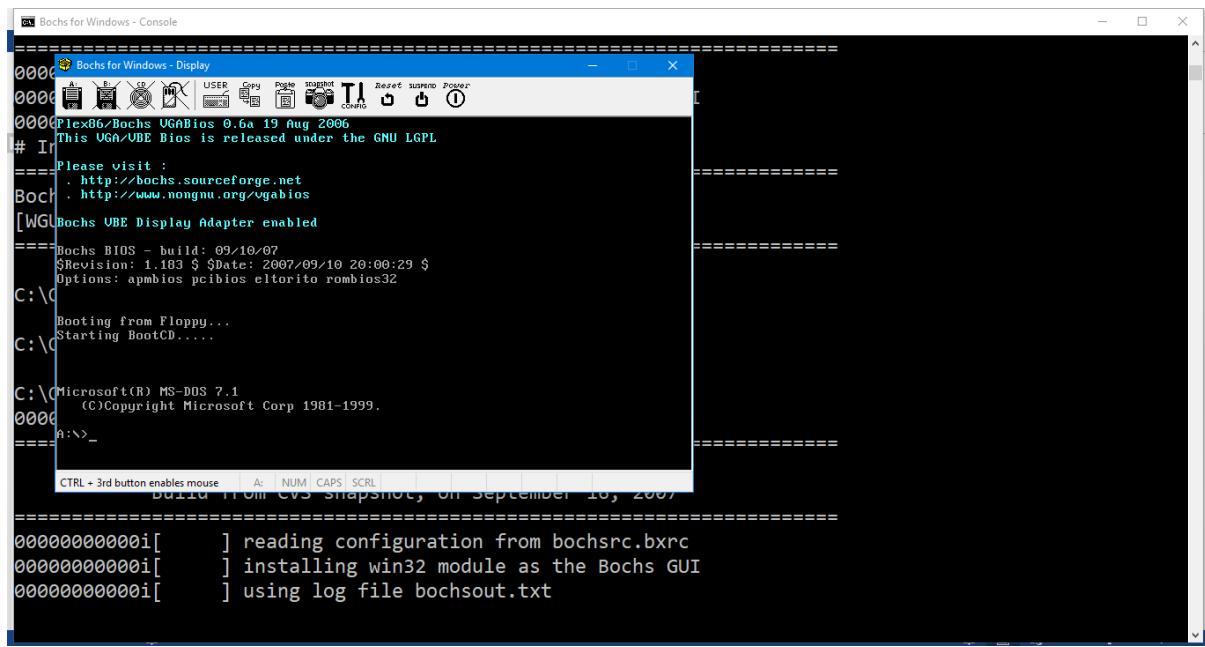
COMMAND	COM	94,292	05-05-03 21:22
	1 file(s)	94,292 bytes	
	0 dir(s)	1,235,968 bytes free	

```
C:>
B:HD:0-N CD:0-S NUM CAPS SCRL
```

Build from CVS snapshot, on September 16, 2007

```
00000000000i[      ] reading configuration from bochsrc2.txt
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] using log file bochsout.txt
```

15. Kemudian menjalankan perintah “S” lagi. Sehingga tampilanya seperti berikut.



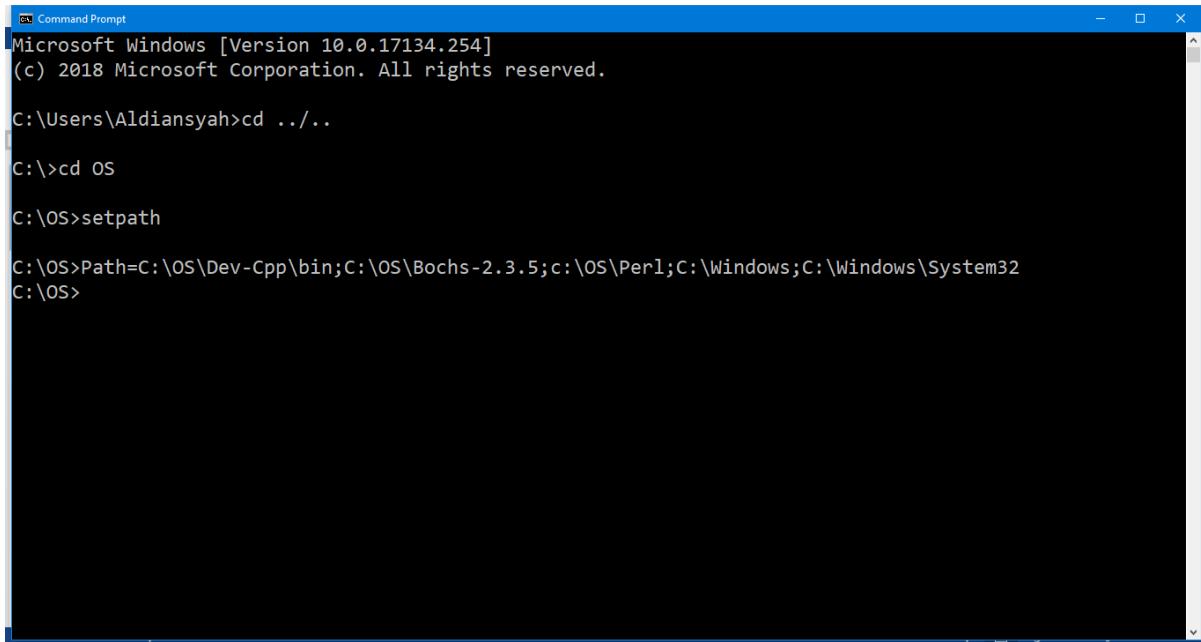
MODUL 2

Nama : Muhammad Izzuddin

NIM : L200170025

Kelas : BS

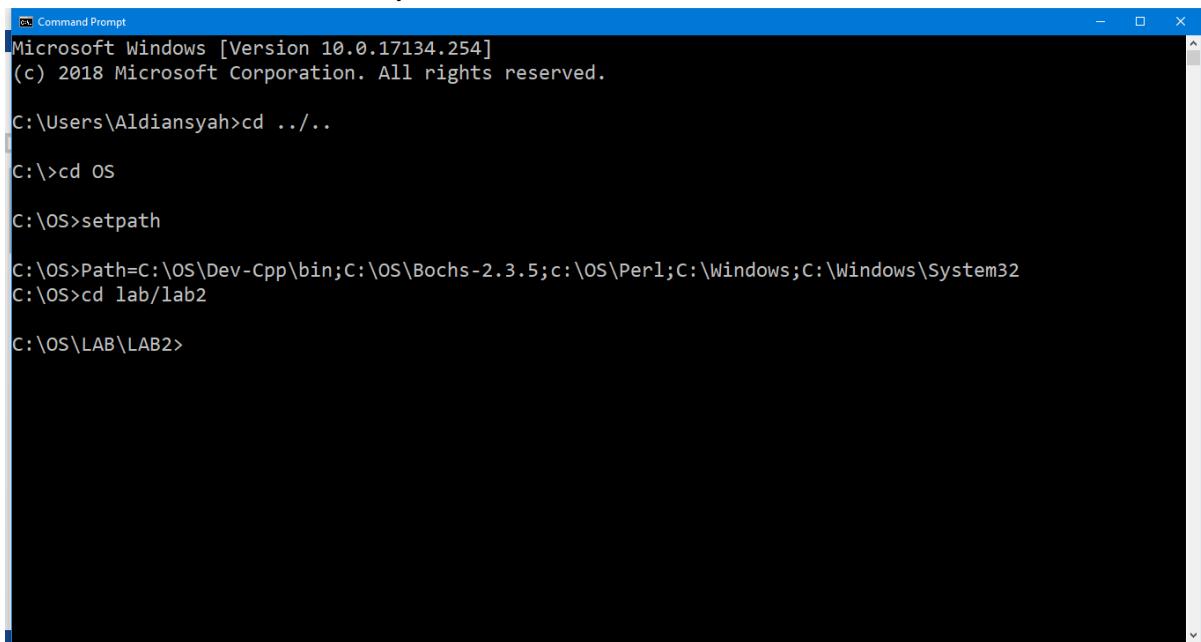
16. Pindah direktori ke direktori OS,kemudian menjalankan perintah setpath



```
Microsoft Windows [Version 10.0.17134.254]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Aldiansyah>cd ../..
C:\>cd 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>
```

2. Pindah direktori ke folfer lab/lab2



```
Microsoft Windows [Version 10.0.17134.254]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Aldiansyah>cd ../..
C:\>cd 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>
```

3. Menjalankan perintah “dir” untuk melihat isi dari folder “LAB2””

```

C:\OS>cd lab/lab2
C:\OS\LAB\LAB2>dir
Volume in drive C has no label.
Volume Serial Number is B0A5-4262

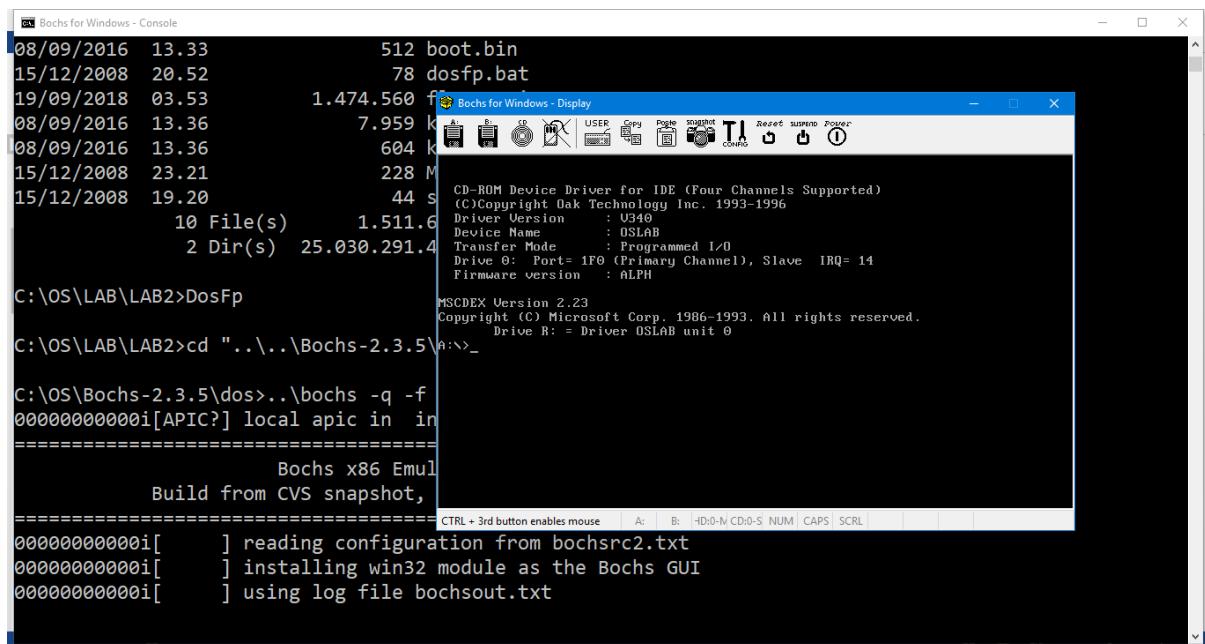
Directory of C:\OS\LAB\LAB2

20/09/2017  15.24    <DIR>      .
20/09/2017  15.24    <DIR>      ..
08/09/2016  13.37          10.130 bochs.log
15/12/2008  23.18          1.625 bochsrc.bxrc
08/09/2016  13.33          15.926 boot.asm
08/09/2016  13.33          512 boot.bin
15/12/2008  20.52          78 dosfp.bat
19/09/2018  03.49          1.474.560 floppya.img
08/09/2016  13.36          7.959 kernel.asm
08/09/2016  13.36          604 kernel.bin
15/12/2008  23.21          228 Makefile
15/12/2008  19.20          44 s.bat
                           10 File(s)   1.511.666 bytes
                           2 Dir(s)   25.031.491.584 bytes free

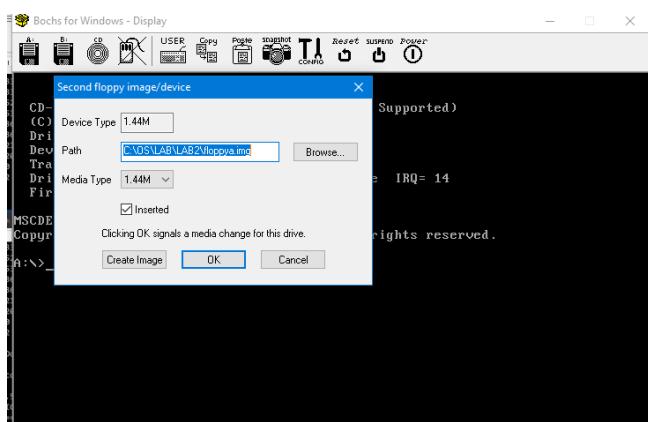
C:\OS\LAB\LAB2>

```

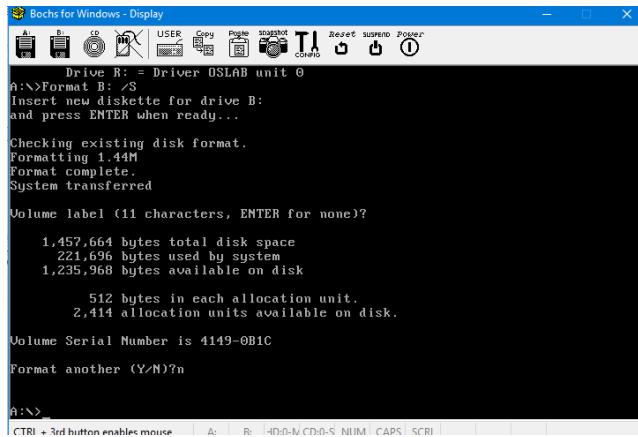
4. Menjalankan perintah “DosFp” kemudian klik menu gambar floppya disk nomer 2.



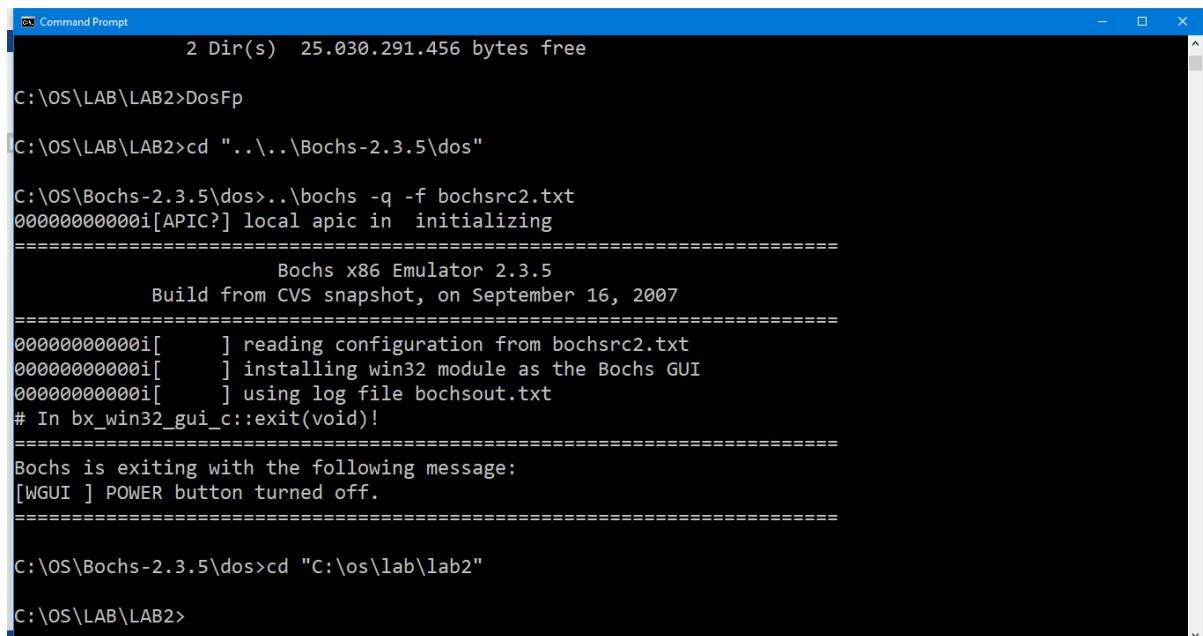
5. Pastikan pathnya itu floppya.img pada direktori lab2, kalau tidak silahkan diganti.



6. Menjalankan perintah “Format B: /S”



7. keluar dari Boschs-2.3.5



8. menjalankan perintah “S” pada command prompt

The screenshot shows a Windows Command Prompt window titled "Bochs for Windows - Console". The command "C:\OS\LAB\LAB2>S" is being typed. The output shows the Bochs BIOS boot process, including configuration reading, module installation, and log file creation. A separate window titled "Bochs for Windows - Display" shows the graphical user interface with a message about the UGA-UBE BIOS release.

```
0000000000i[      ] reading configuration from bochssrc2.txt
0000000000i[      ] installing win32 module as the Bochs GUI
0000000000i[      ] 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\lab"
Bochs UBE Display Adapter enabled

C:\OS\LAB\LAB2>S
Bochs BIOS - build: 09/10/07
$Revision: 1.183 $ $Date: 2007/09/10 20:00:29 $
Options: apmbios pcibios eltorito rombios32

Bochs x86 Emulator
Build from CVS snapshot, or
Microsoft(R) MS-DOS 7.1
(C)Copyright Microsoft Corp 1981-1999.

A:>_
```

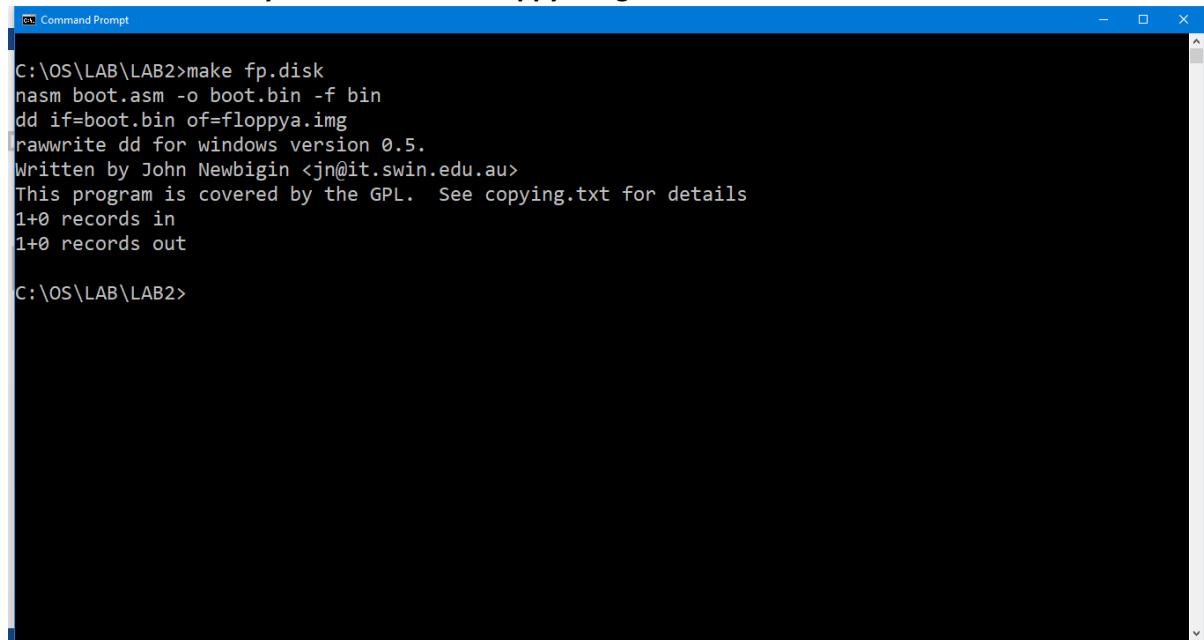
0000000000i[] reading configuration
0000000000i[] installing win32 module
0000000000i[] using log file bochs.log

9. ketikan perintah “cls”

The screenshot shows a Windows Command Prompt window titled "Command Prompt". The command "C:\OS\LAB\LAB2>cls" is being typed. The screen is currently blank, indicating that the command has cleared the previous output.

```
C:\OS\LAB\LAB2>
```

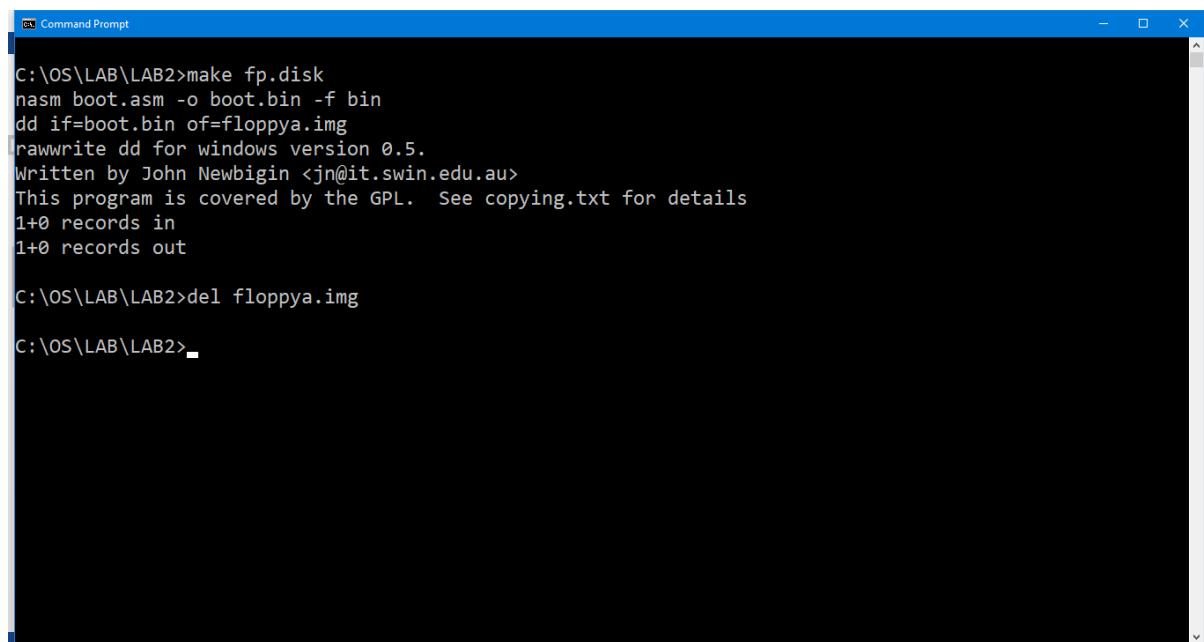
10. Menjalankan perintah “Make fp.disk” untuk kompilasi source code “boot.asm” dan memindahkan hasilnya ke bootsector “floppya.img”



```
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>
```

11. Menghapus file floppya.img



```
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>del floppya.img
C:\OS\LAB\LAB2>
```

12. Membuat ulang file floppya.img

```
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>del floppya.img

C:\OS\LAB\LAB2>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] -
```

13. mengedit isi boot.asm

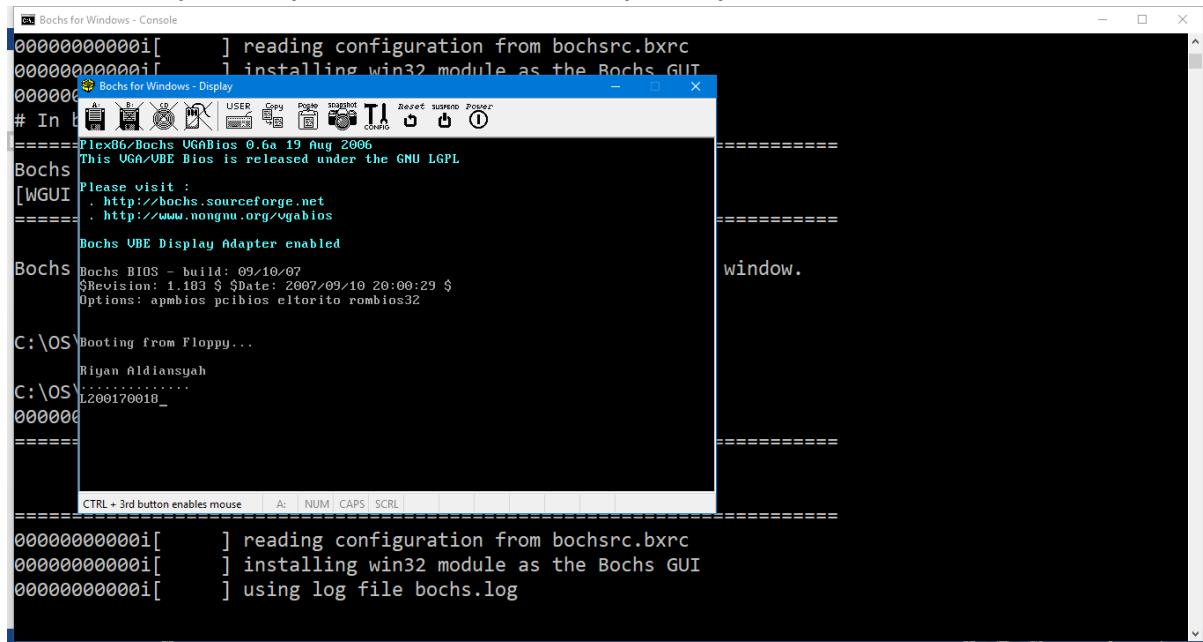
```
boot.asm - Notepad
File Edit Format View Help
      inc    dl           ; adjust for sector 0
      mov    BYTE [absoluteSector], dl
      xor    dx, dx         ; prepare dx:ax for operation
      div    WORD [NumHeads]
      mov    BYTE [absoluteHead], dl
      mov    BYTE [absoluteTrack], al
      ret

absoluteSector db 0x00
absoluteHead   db 0x00
absoluteTrack  db 0x00

datasector dw 0x0000
cluster dw 0x0000
ImageName db "KERNEL BIN"
msgLoading db 0x0D, 0x0A, "Rryan Aldiansyah ", 0x0D, 0x0A, 0x00
msgCRLF  db 0x0D, 0x0A, 0x00
msgProgress db ".", 0x00
msgFailure db 0x0D, 0x0A, "L200170018", 0x00

TIMES 510-($-$) DB 0
DW 0xA55
;*****
```

14. kemudian jalankan perintah “S” kemudian tampilan seperti dibawah.

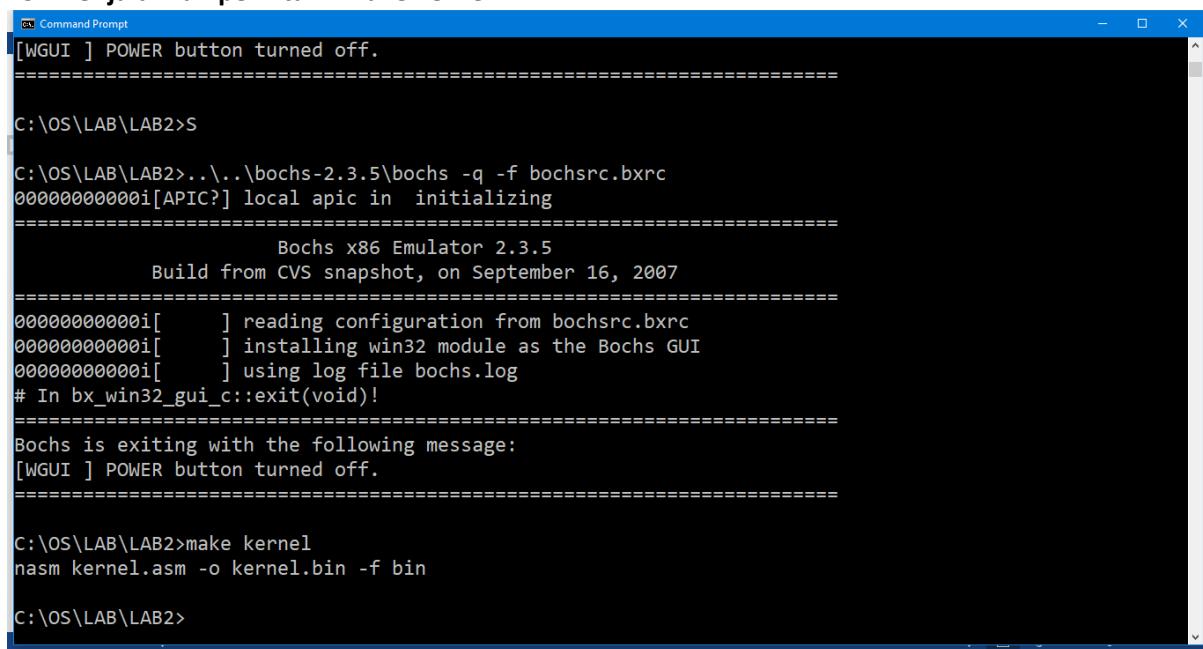


The screenshot shows a Bochs for Windows console window. The log output indicates the system is reading configuration from 'bochssrc.bxrc', installing the win32 module as the Bochs GUI, and booting from a floppy disk. The display adapter is set to VBE. The user logs in as 'Riyant Aldiansyah' and runs the command 'ls'. The log concludes by using the log file 'bochs.log'.

```
00000000000i[      ] reading configuration from bochssrc.bxrc
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] using log file bochs.log
=====
# In bx_win32_gui_c::exit(void)
=====
Bochs UBE Display Adapter enabled
Bochs BIOS - build: 09/10/07
$Revision: 1.103 $ $Date: 2007/09/10 20:00:29 $
Options: apmbios eltorito rombios32

C:\OS>Booting from Floppy...
Riyant Aldiansyah
C:\OS>.....
L200170018_
00000000000i[      ] reading configuration from bochssrc.bxrc
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] using log file bochs.log
=====
```

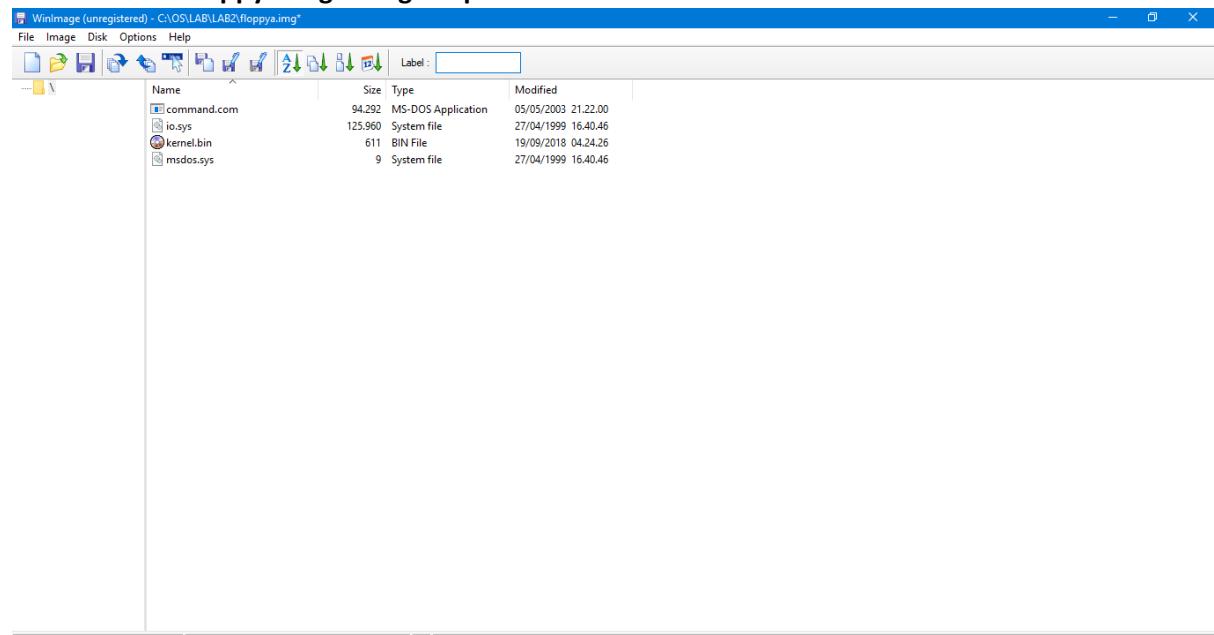
15. Menjalankan perintah “make kernel”



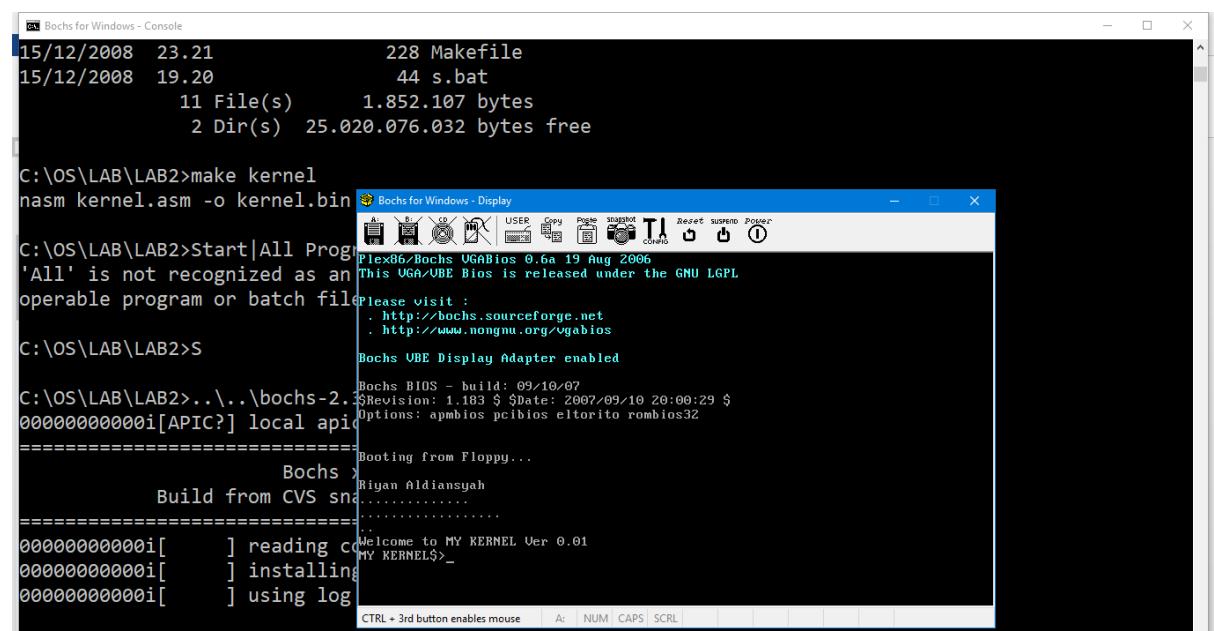
The screenshot shows a Windows Command Prompt window. The user runs 'make kernel' in the directory 'C:\OS\LAB\LAB2'. The process involves using NASM to assemble 'kernel.asm' into 'kernel.bin'. The output shows the configuration of the Bochs x86 Emulator 2.3.5, including the local APIC initialization and the use of the bochssrc.bxrc configuration file.

```
[WGUI ] POWER button turned off.
=====
C:\OS\LAB\LAB2>S
C:\OS\LAB\LAB2>..\..\bochs-2.3.5\bochs -q -f bochssrc.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 bochssrc.bxrc
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] 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>
```

16. kemudian buka file “floppya.img” dengan aplikasi winimage kemudian masukkan “kernel.bin” ke dalam file “floppya.img” dengan aplikasi tersebut.



17. kemudian jalankan perintah “S”, sehingga tampilan seperti dibawah.



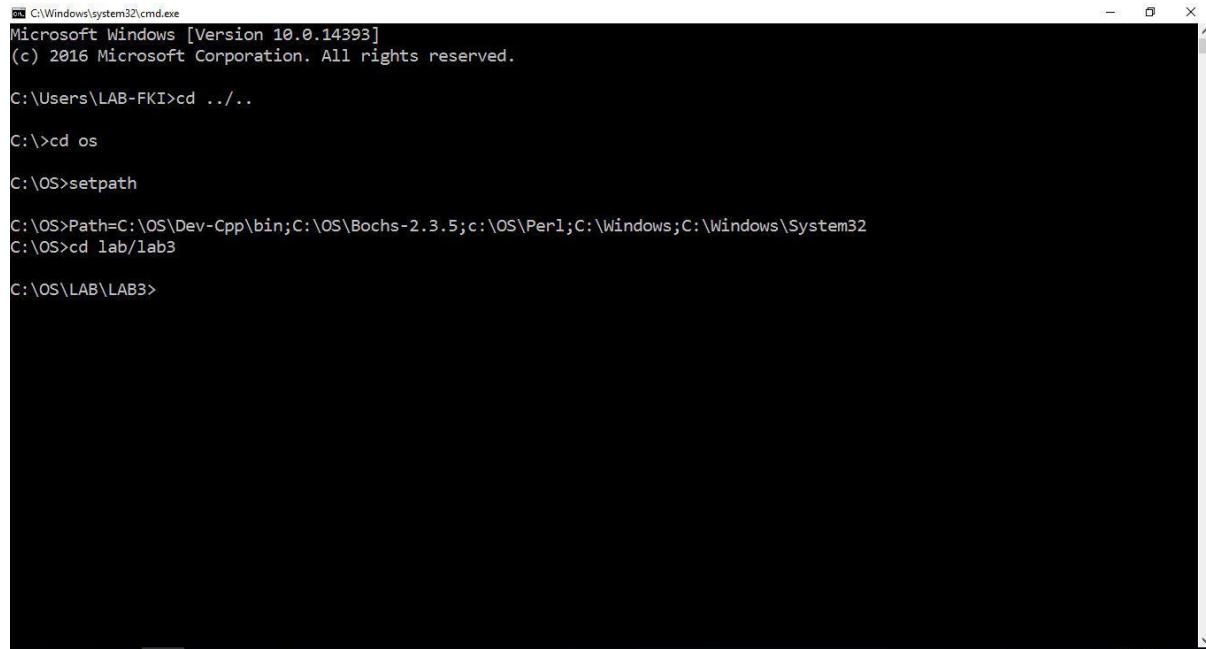
Modul 3

Nama : Muhammad Izzuddin

NIM : L200170025

Kelas : B

1. Masuk ke OS dengan perintah ‘CD OS’, lalu dilanjutkan dengan mamasukan perintah ‘setpath’



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

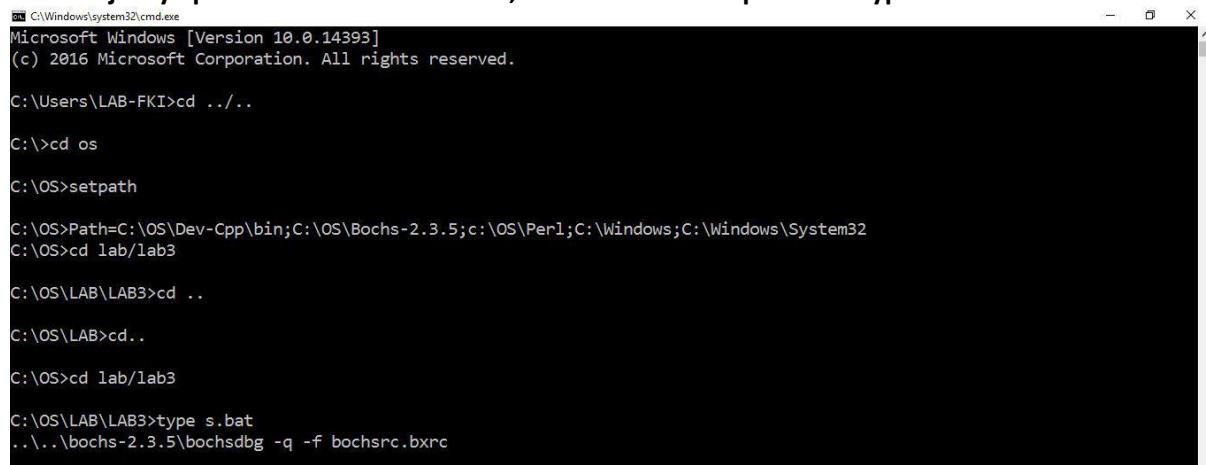
C:\Users\LAB-FKI>cd ../..
C:>cd os

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>
```

2. Selanjutnya pindah direktori ke “lab3”, kemudian ketikan perintah ‘type s.bat’



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\LAB-FKI>cd ../..
C:>cd 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

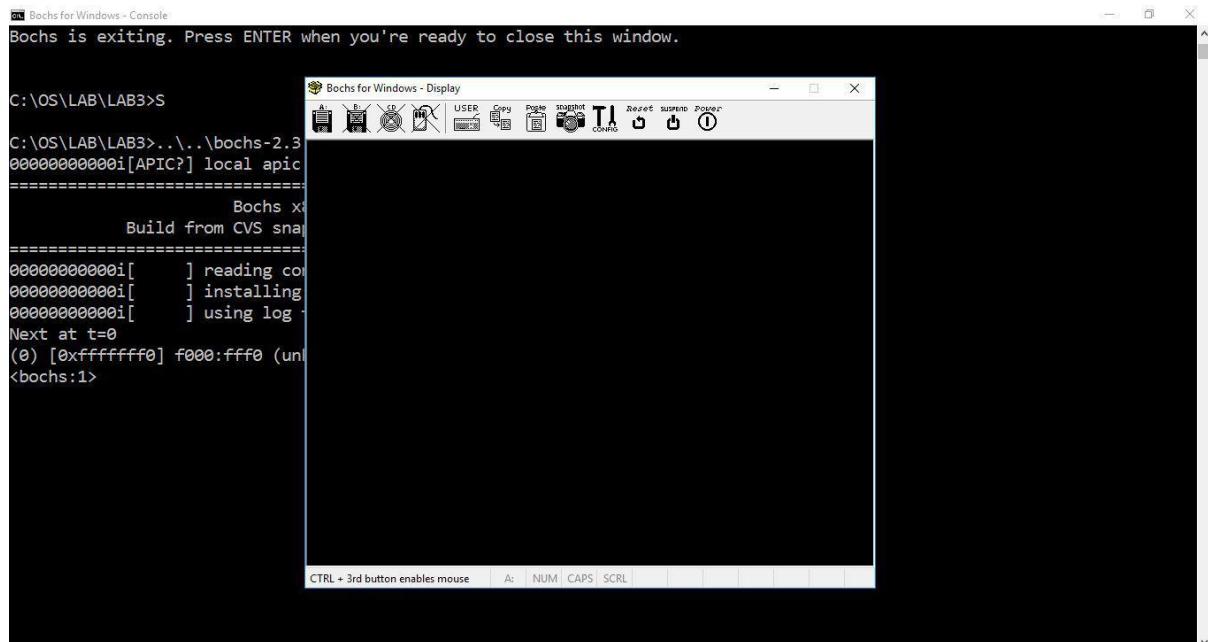
C:\OS\LAB\LAB3>cd ..

C:\OS\LAB>cd..

C:\OS>cd lab/lab3

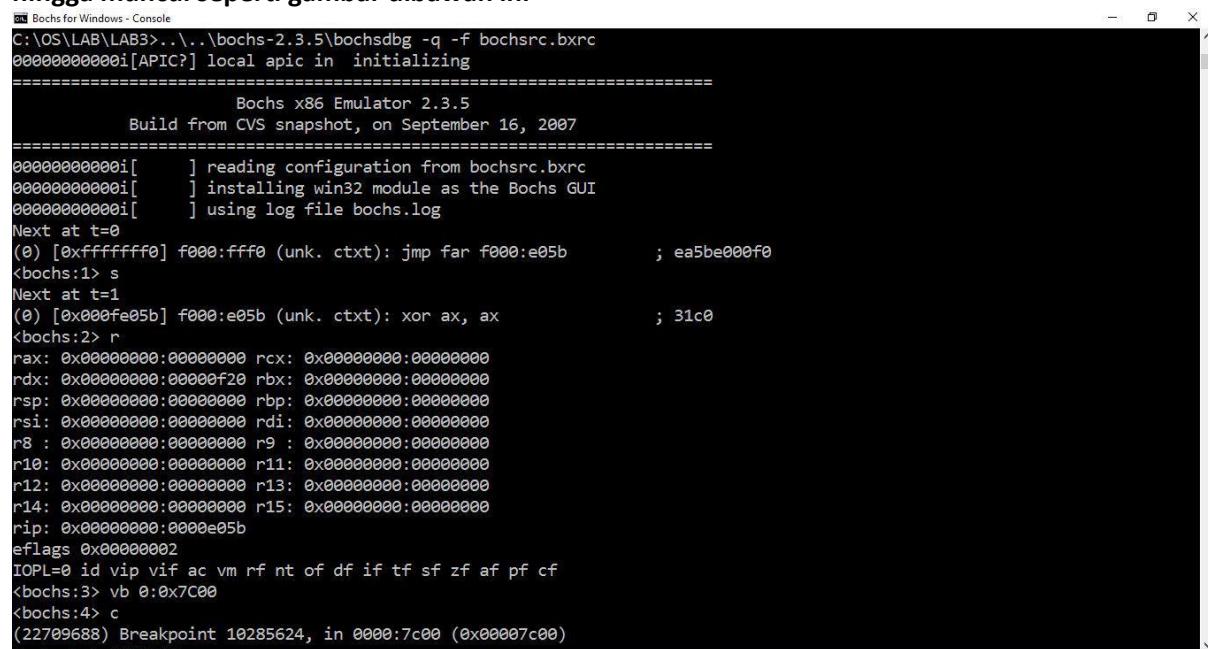
C:\OS\LAB\LAB3>type s.bat
..\\bochs-2.3.5\bochsdbg -q -f bochssrc.bxrc
```

3. Dilanjutkan dengan memasukan perintah ‘s’ untuk masuk ke PC simulator dan akan muncul seperti gambar dibawah ini



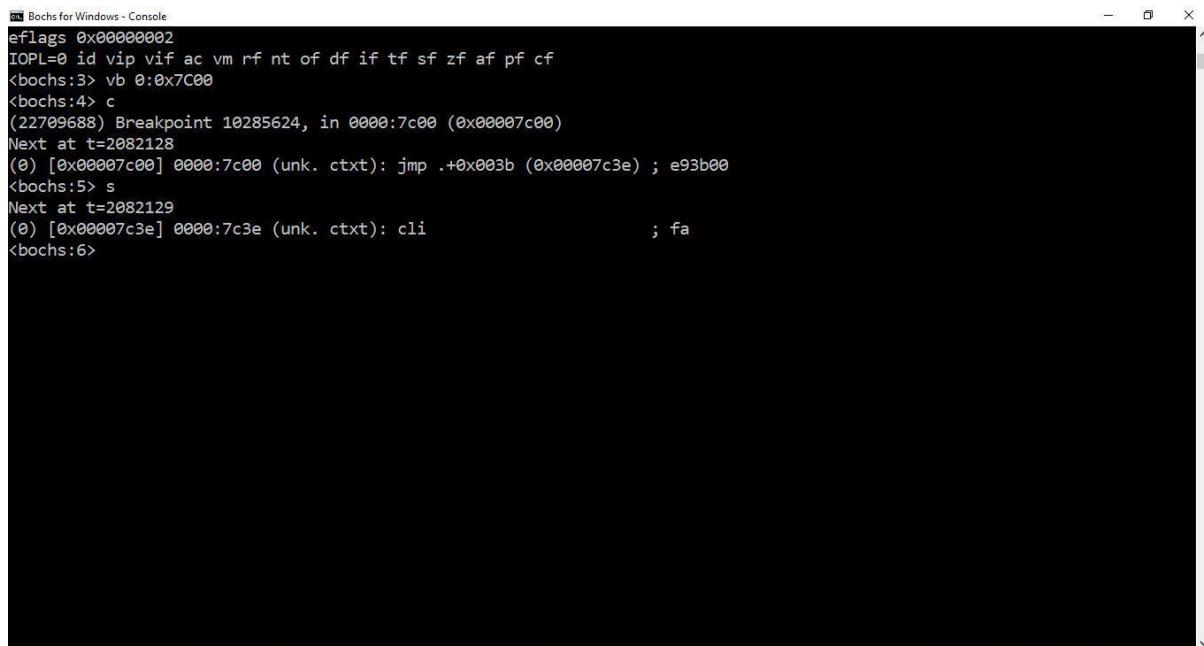
```
C:\OS\LAB\LAB3>S
C:\OS\LAB\LAB3>..\bochs-2.3
000000000i[APIC?] local apic
=====
Bochs x86
Build from CVS snapshot
=====
000000000i[      ] reading config
000000000i[      ] installing
000000000i[      ] using log
Next at t=0
(0) [0xffffffff] f000:ffff0 (unk)
<bochs:1>
```

4. Ketikan perintah ‘s’ dan kemudian ketikan perintah “r” dan juga perintah “vb 0:0x7C00” hingga muncul seperti gambar dibawah ini



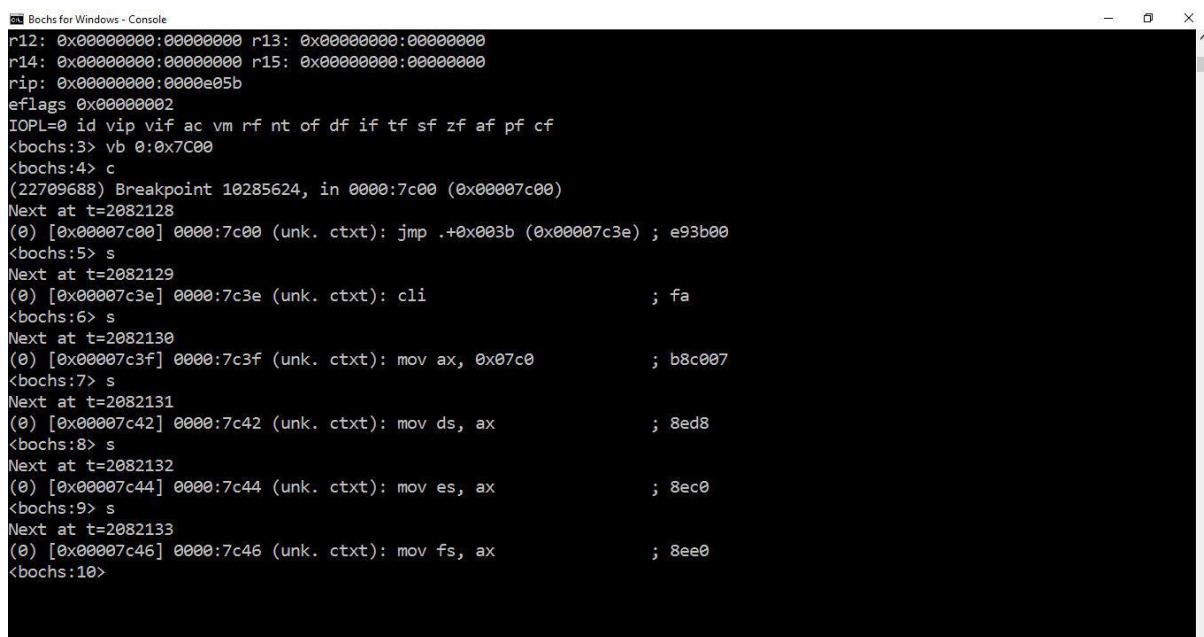
```
C:\OS\LAB\LAB3>..\bochs-2.3.5\bochsrc -q -f bochsrc.bxrc
000000000i[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000i[      ] reading configuration from bochsrc.bxrc
000000000i[      ] installing win32 module as the Bochs GUI
000000000i[      ] using log file bochs.log
Next at t=0
(0) [0xffffffff] f000:ffff0 (unk. ctxt): jmp far f000:e05b      ; ea5be000f0
<bochs:1> s
Next at t=1
(0) [0x0000fe05b] f000:e05b (unk. ctxt): xor ax, ax      ; 31c0
<bochs:2> 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:3> vb 0:0x7C00
<bochs:4> c
(22709688) Breakpoint 10285624, in 0000:7c00 (0x00007c00)
```

5. ketikan perintah “c” kemudian ketikan perintah “s’



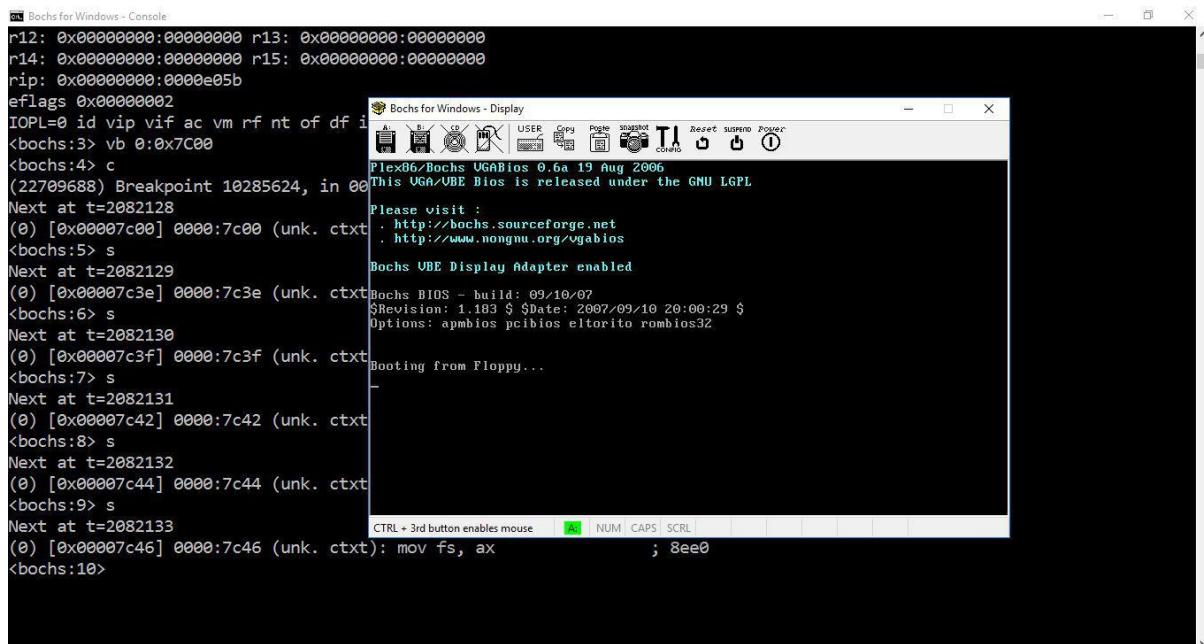
```
Bochs for Windows - Console
eflags 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:3> vb 0:0x7C00
<bochs:4> c
(22709688) Breakpoint 10285624, in 0000:7c00 (0x00007c00)
Next at t=2082128
(0) [0x00007c00] 0000:7c00 (unk. ctxt): jmp .+0x003b (0x00007c3e) ; e93b00
<bochs:5> s
Next at t=2082129
(0) [0x00007c3e] 0000:7c3e (unk. ctxt): cli ; fa
<bochs:6>
```

6. ketikan perintah “s” secara berulang-ulang



```
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:3> vb 0:0x7C00
<bochs:4> c
(22709688) Breakpoint 10285624, in 0000:7c00 (0x00007c00)
Next at t=2082128
(0) [0x00007c00] 0000:7c00 (unk. ctxt): jmp .+0x003b (0x00007c3e) ; e93b00
<bochs:5> s
Next at t=2082129
(0) [0x00007c3e] 0000:7c3e (unk. ctxt): cli ; fa
<bochs:6> s
Next at t=2082130
(0) [0x00007c3f] 0000:7c3f (unk. ctxt): mov ax, 0x07c0 ; b8c007
<bochs:7> s
Next at t=2082131
(0) [0x00007c42] 0000:7c42 (unk. ctxt): mov ds, ax ; 8ed8
<bochs:8> s
Next at t=2082132
(0) [0x00007c44] 0000:7c44 (unk. ctxt): mov es, ax ; 8ec0
<bochs:9> s
Next at t=2082133
(0) [0x00007c46] 0000:7c46 (unk. ctxt): mov fs, ax ; 8ee0
<bochs:10>
```

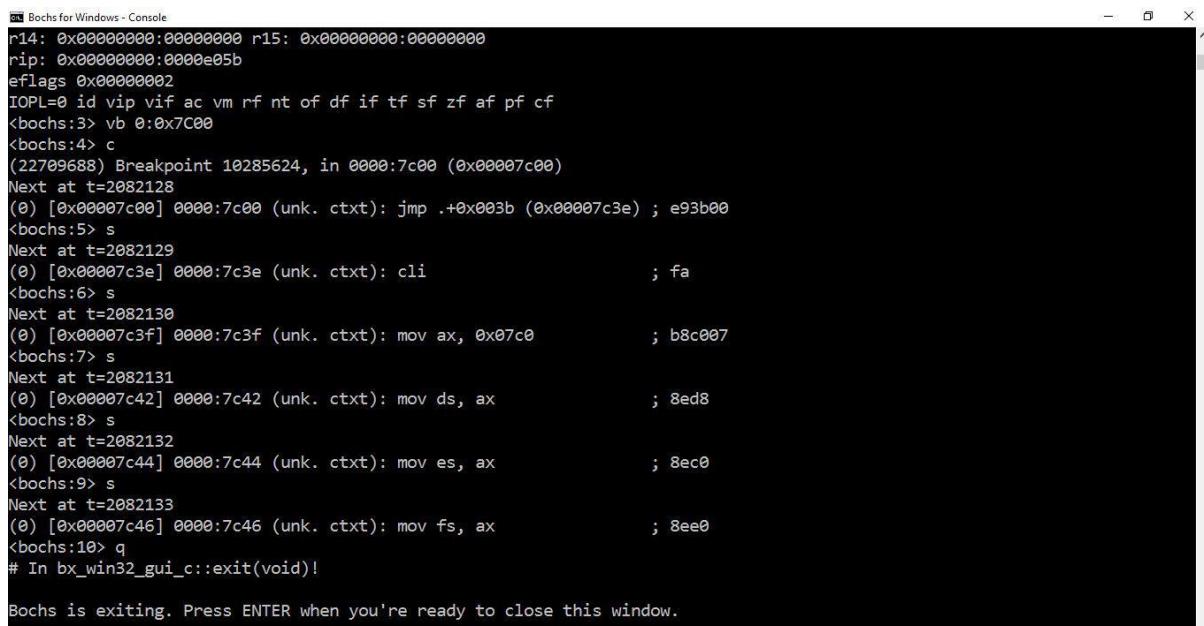
7. dan ini adalah tampilan Pc-simulator setelah menjalankan prosedur diatas tadi.



The screenshot shows the Bochs for Windows console window. The assembly code displayed is:

```
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 i
<bochs:3> vb 0:0x7C00
<bochs:4> c
(22709688) Breakpoint 10285624, in 0000:7c00
Next at t=2082128
Please visit :
(0) [0x00007c00] 0000:7c00 (unk. ctxt)
<bochs:5> s
Bochs VBE Display Adapter enabled
Bochs BIOS - build: 09/10/07
$Revision: 1.193 $ $Date: 2007/09/10 20:00:29 $ Options: apmbios pcibios eltorito rombios32
Next at t=2082129
Booting from Floppy...
<bochs:7> s
Next at t=2082130
<bochs:6> s
Next at t=2082130
(0) [0x00007c3f] 0000:7c3f (unk. ctxt)
<bochs:8> s
Next at t=2082130
(0) [0x00007c44] 0000:7c44 (unk. ctxt)
<bochs:9> s
Next at t=2082133
(0) [0x00007c46] 0000:7c46 (unk. ctxt): mov fs, ax ; 8ee0
<bochs:10>
```

8. ketikan perintah 'q' untuk menghentikan proses debugging



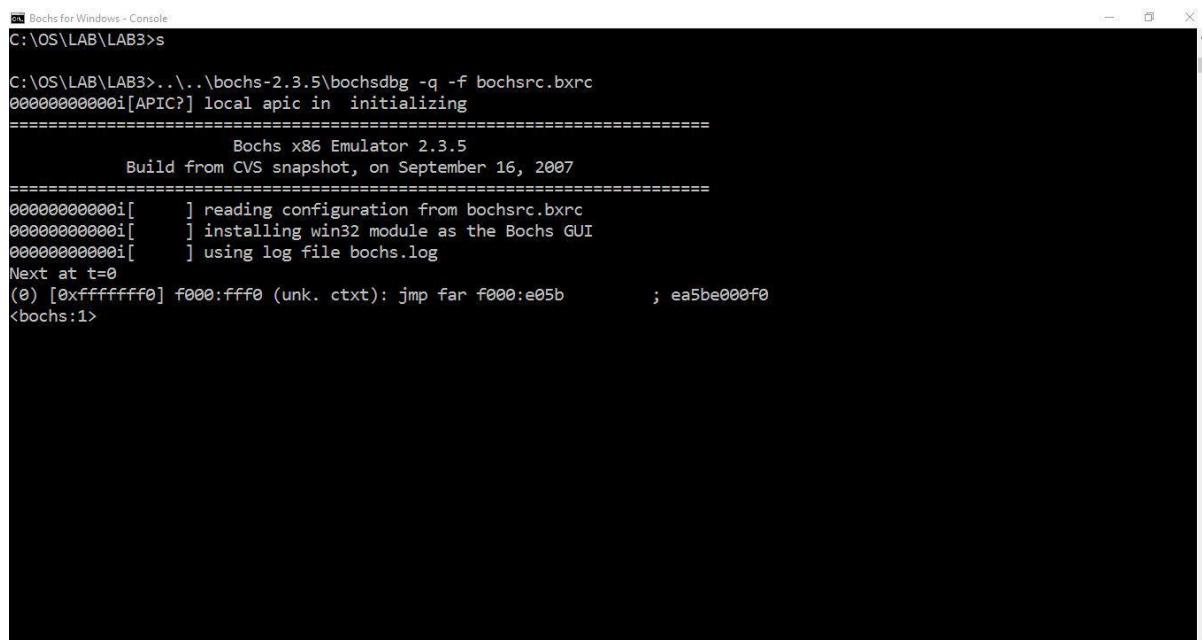
The screenshot shows the Bochs for Windows console window. The assembly code displayed is identical to the previous screenshot, but the command entered is:

```
<bochs:10> q
# In bx_win32_gui_c::exit(void)!
```

At the bottom of the window, it says:

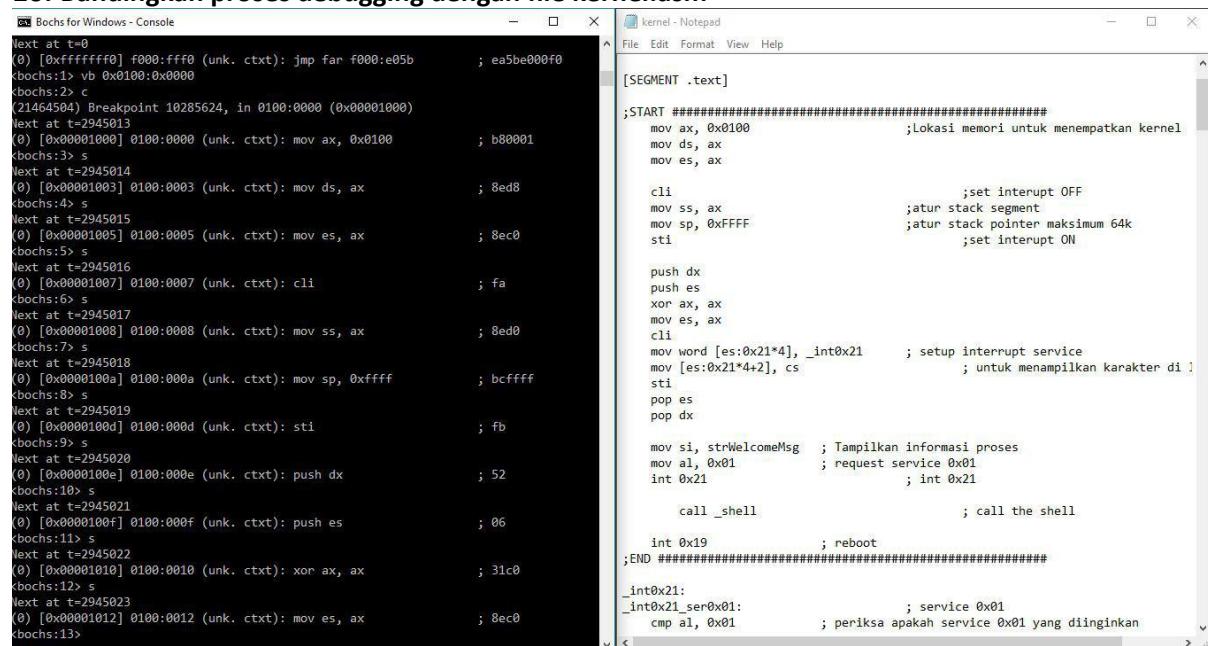
Bochs is exiting. Press ENTER when you're ready to close this window.

9. Ketikan perintah 's' untuk kembali masuk ke PC simulator



```
C:\OS\LAB\LAB3>..\\bochs-2.3.5\bochsdbg -q -f bochsrc.bxrc
0000000000i[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
0000000000i[      ] reading configuration from bochsrc.bxrc
0000000000i[      ] installing win32 module as the Bochs GUI
0000000000i[      ] using log file bochs.log
Next at t=0
(0) [0xffffffffff] f000:ffff0 (unk. ctxt): jmp far f000:e05b      ; ea5be000f0
<bochs:1>
```

10. Bandingkan proses debugging dengan file kernel.asm



```
lext at t=0
(0) [0xffffffffff] f000:ffff0 (unk. ctxt): jmp far f000:e05b      ; ea5be000f0
<bochs:1> v b 0x0100:0x0000
<bochs:2> c
(21464504) Breakpoint 10285624, in 0100:0000 (0x00001000)
Next at t=2945013
(0) [0x00001000] 0100:0000 (unk. ctxt): mov ax, 0x0100      ; b80001
<bochs:3> s
lext at t=2945014
(0) [0x00001003] 0100:0003 (unk. ctxt): mov ds, ax      ; 8ed8
<bochs:4> s
lext at t=2945015
(0) [0x00001005] 0100:0005 (unk. ctxt): mov es, ax      ; 8ec0
<bochs:5> s
lext at t=2945016
(0) [0x00001007] 0100:0007 (unk. ctxt): cli      ; fa
<bochs:6> s
lext at t=2945017
(0) [0x00001008] 0100:0008 (unk. ctxt): mov ss, ax      ; 8ed0
<bochs:7> s
lext at t=2945018
(0) [0x0000100a] 0100:000a (unk. ctxt): mov sp, 0xfffff      ; bcffff
<bochs:8> s
lext at t=2945019
(0) [0x0000100d] 0100:000d (unk. ctxt): sti      ; fb
<bochs:9> s
lext at t=2945020
(0) [0x0000100e] 0100:000e (unk. ctxt): push dx      ; 52
<bochs:10> s
lext at t=2945021
(0) [0x0000100f] 0100:000f (unk. ctxt): push es      ; 06
<bochs:11> s
lext at t=2945022
(0) [0x00001010] 0100:0010 (unk. ctxt): xor ax, ax      ; 31c0
<bochs:12> s
lext at t=2945023
(0) [0x00001012] 0100:0012 (unk. ctxt): mov es, ax      ; 8ec0
<bochs:13>
```

```
[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

    call _shell                ; call the shell

    int 0x19                  ; reboot
;END #####
_int0x21:
_int0x21_ser0x01:
    cmp al, 0x01                ; periksa apakah service 0x01 yang diinginkan
```

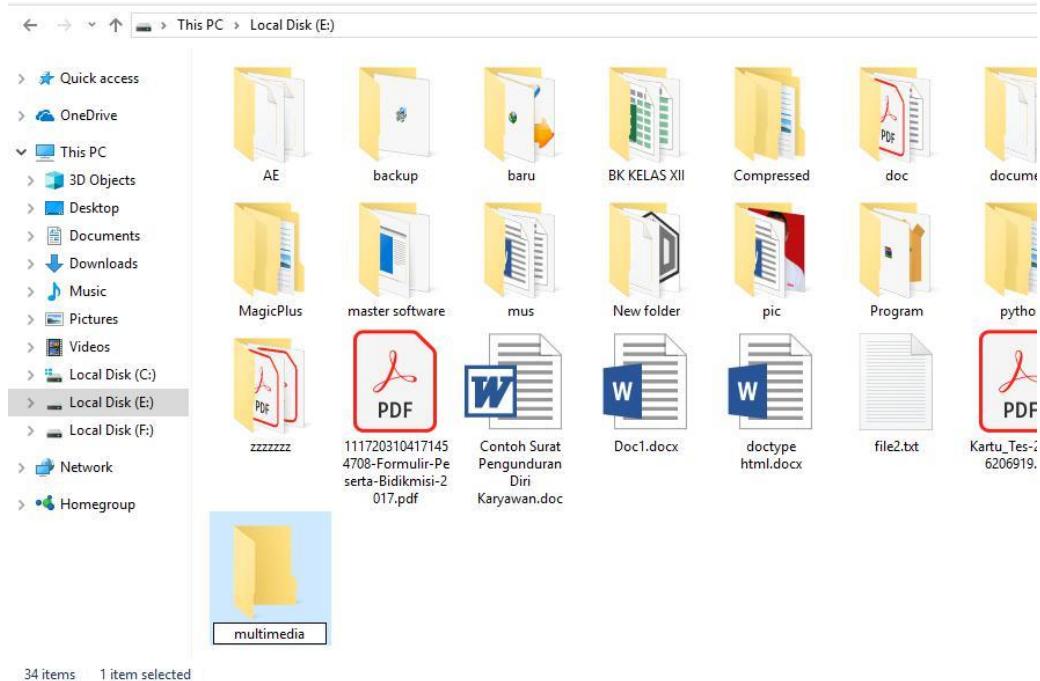
MODUL 4

Nama : Muhammad Izzuddin

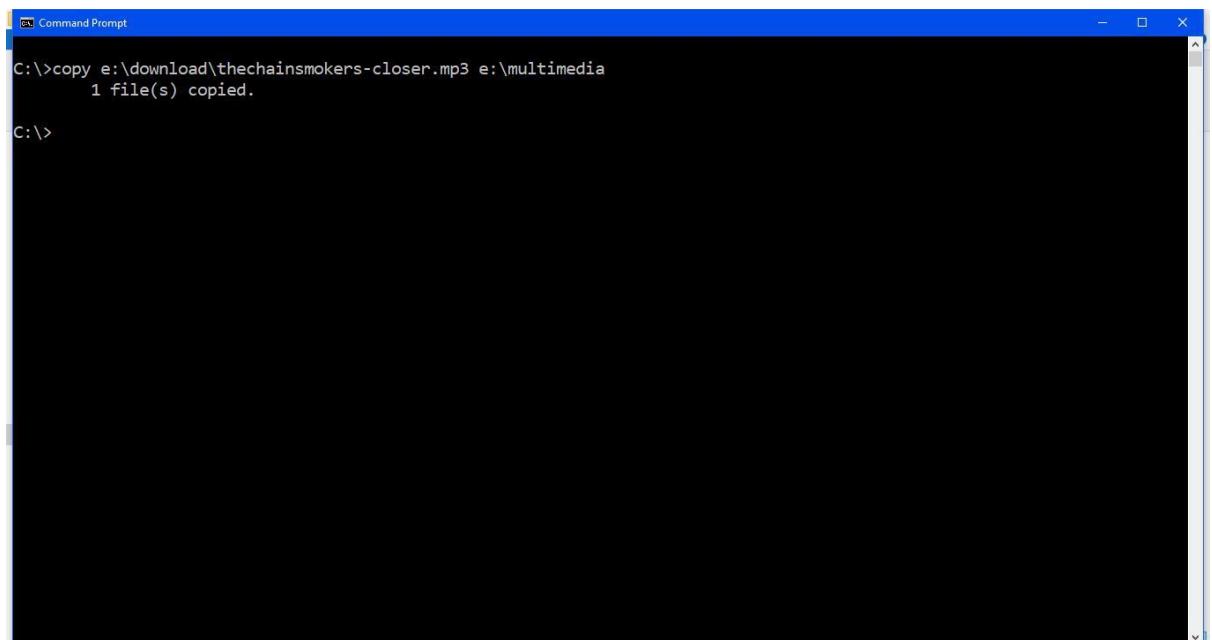
NIM : L200170025

Kelas : B

3. Membuat sebuah folder bernama multimedia di drive E, seperti gambar dibawah ini.



- 4. Menyalin file musik (thechainsmokers-closer.mp3) yang berada di drive E pada folder "download" disalin ke folder "multimedia"**



A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows the following command being run:

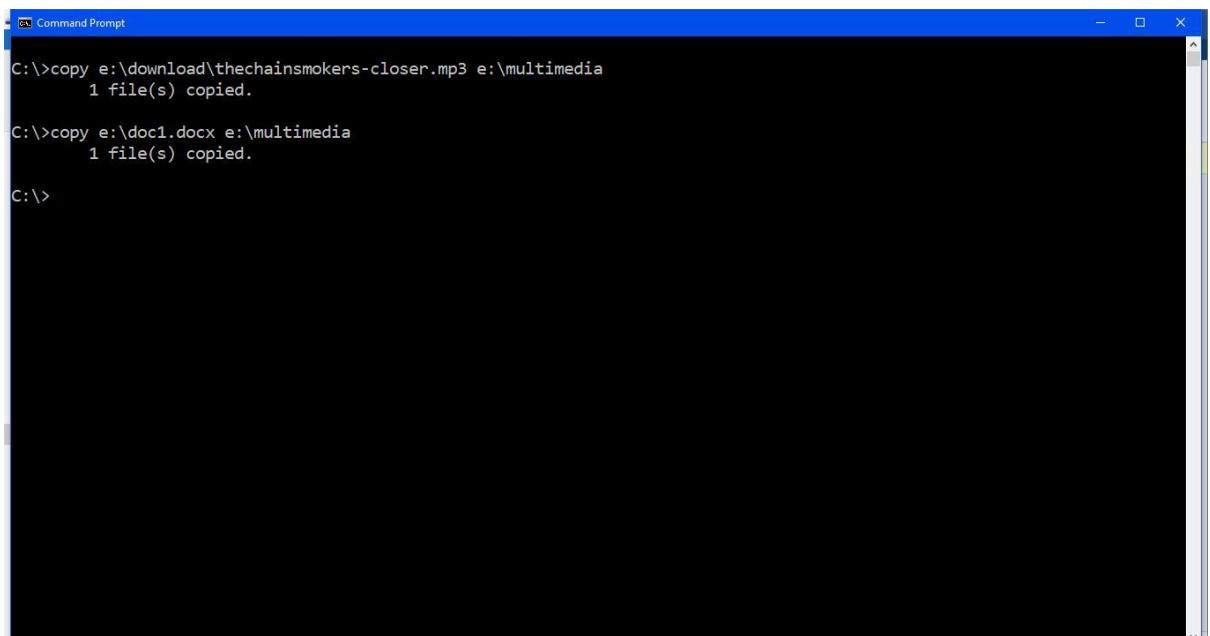
```
C:\>copy e:\download\thechainsmokers-closer.mp3 e:\multimedia
```

The output of the command is displayed below the command line:

```
1 file(s) copied.
```

The command prompt is located at the bottom left of the window, and the cursor is visible at the prompt.

5. Menyalin file musik (doc1.docx) yang berada di drive E disalin ke folder “multimedia”

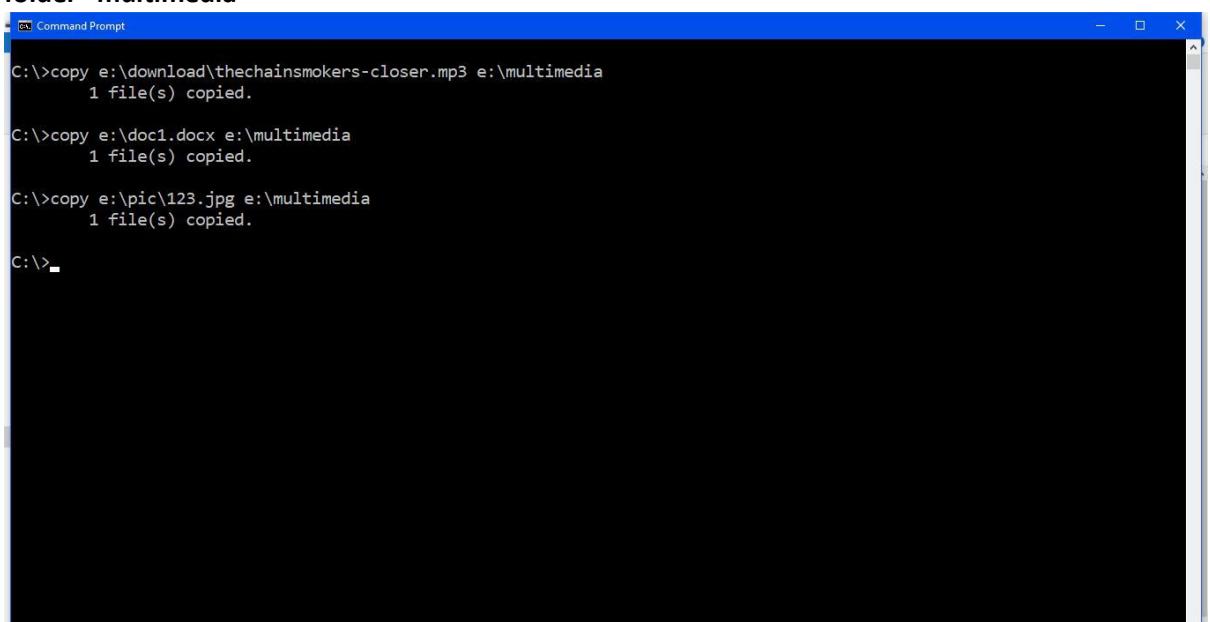


```
Command Prompt
C:\>copy e:\download\thechainsmokers-closer.mp3 e:\multimedia
1 file(s) copied.

C:\>copy e:\doc1.docx e:\multimedia
1 file(s) copied.

C:\>
```

9. Menyalin file musik (123.jpg) yang berada di drive E pada folder “pic” disalin ke folder “multimedia”



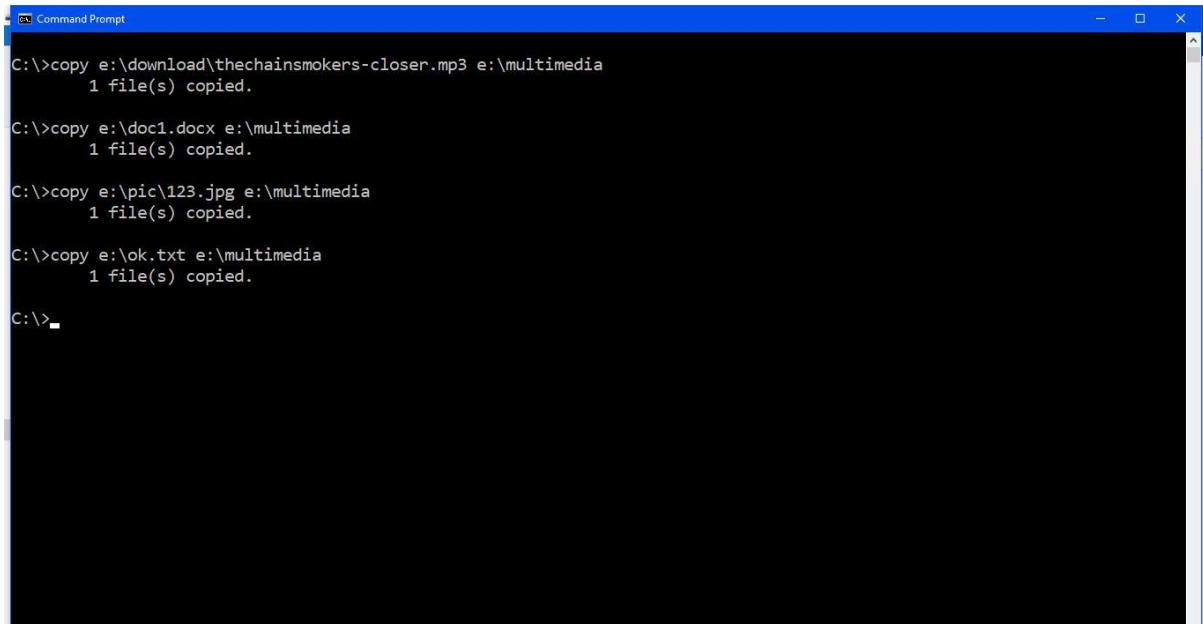
```
Command Prompt
C:\>copy e:\download\thechainsmokers-closer.mp3 e:\multimedia
1 file(s) copied.

C:\>copy e:\doc1.docx e:\multimedia
1 file(s) copied.

C:\>copy e:\pic\123.jpg e:\multimedia
1 file(s) copied.

C:\>
```

10. Menyalin file musik (ok.txt) yang berada di drive E disalin ke folder “multimedia”



```
Command Prompt
C:\>copy e:\download\thechainsmokers-closer.mp3 e:\multimedia
      1 file(s) copied.

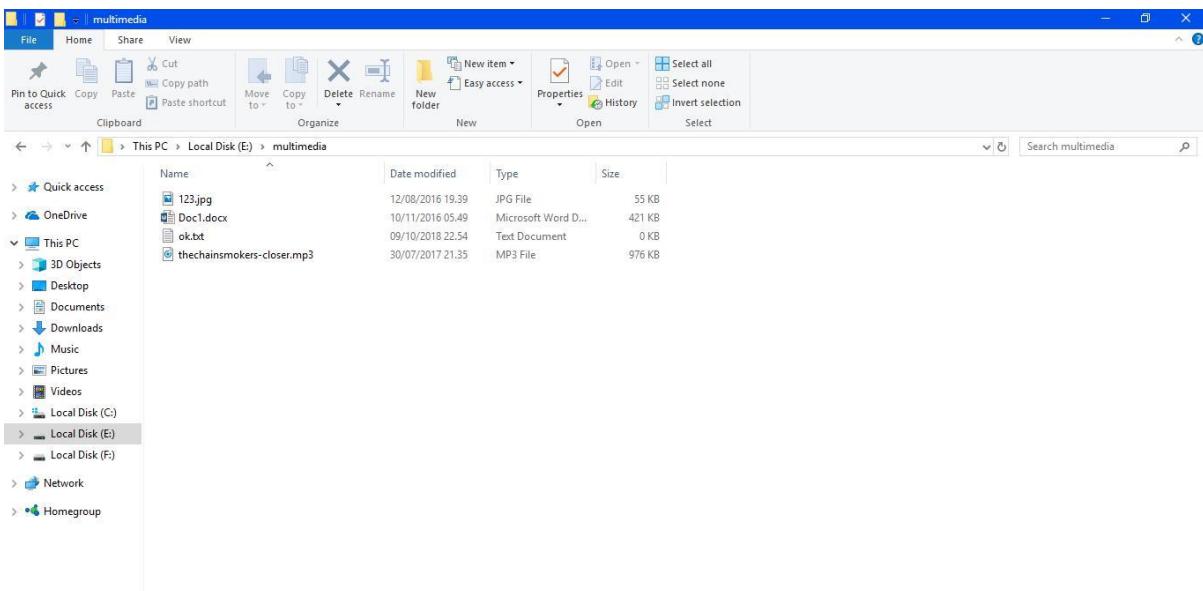
C:\>copy e:\doc1.docx e:\multimedia
      1 file(s) copied.

C:\>copy e:\pic\123.jpg e:\multimedia
      1 file(s) copied.

C:\>copy e:\ok.txt e:\multimedia
      1 file(s) copied.

C:\>
```

11. Membuka folder multimedia untuk memastikan bahwa semua file yang disalin tadi benar-benar tersalin

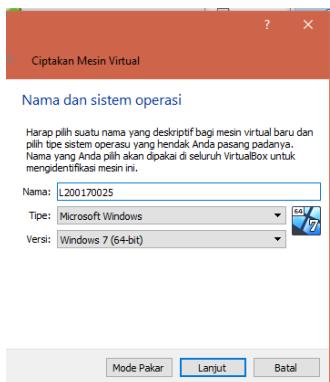


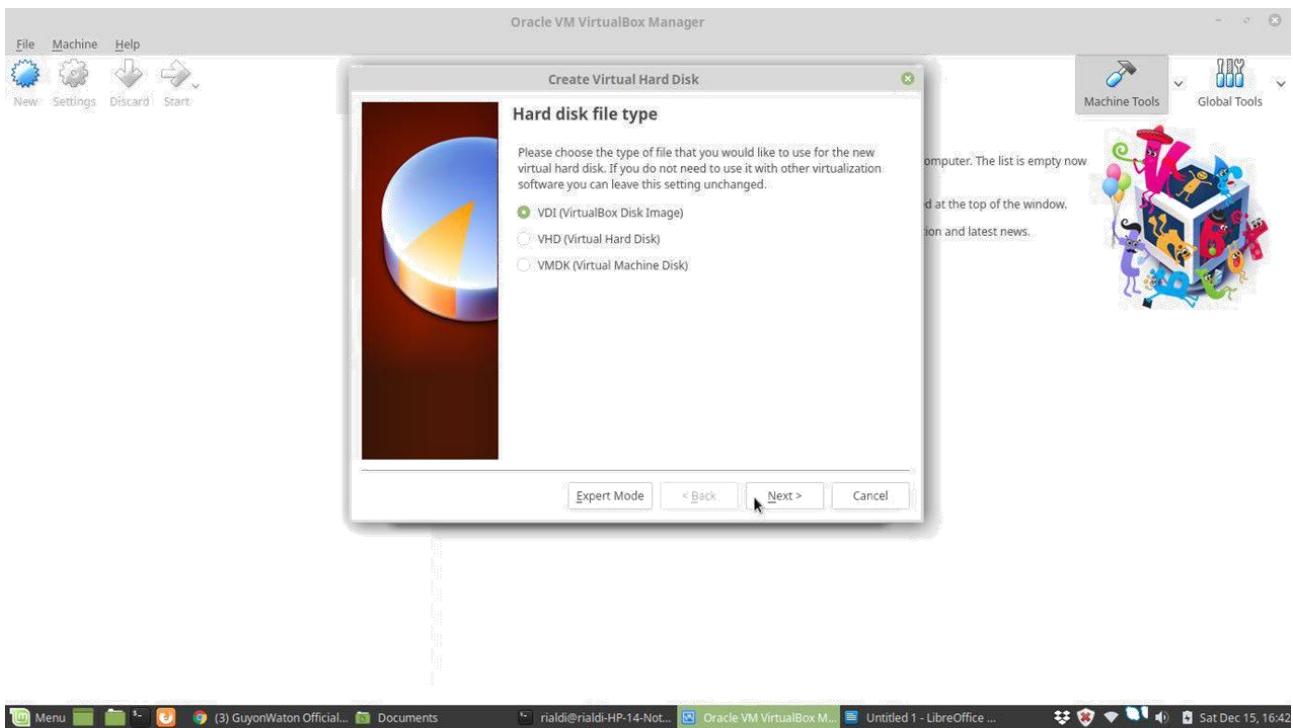
MODUL 5

Nama : Muhammad Izzuddin

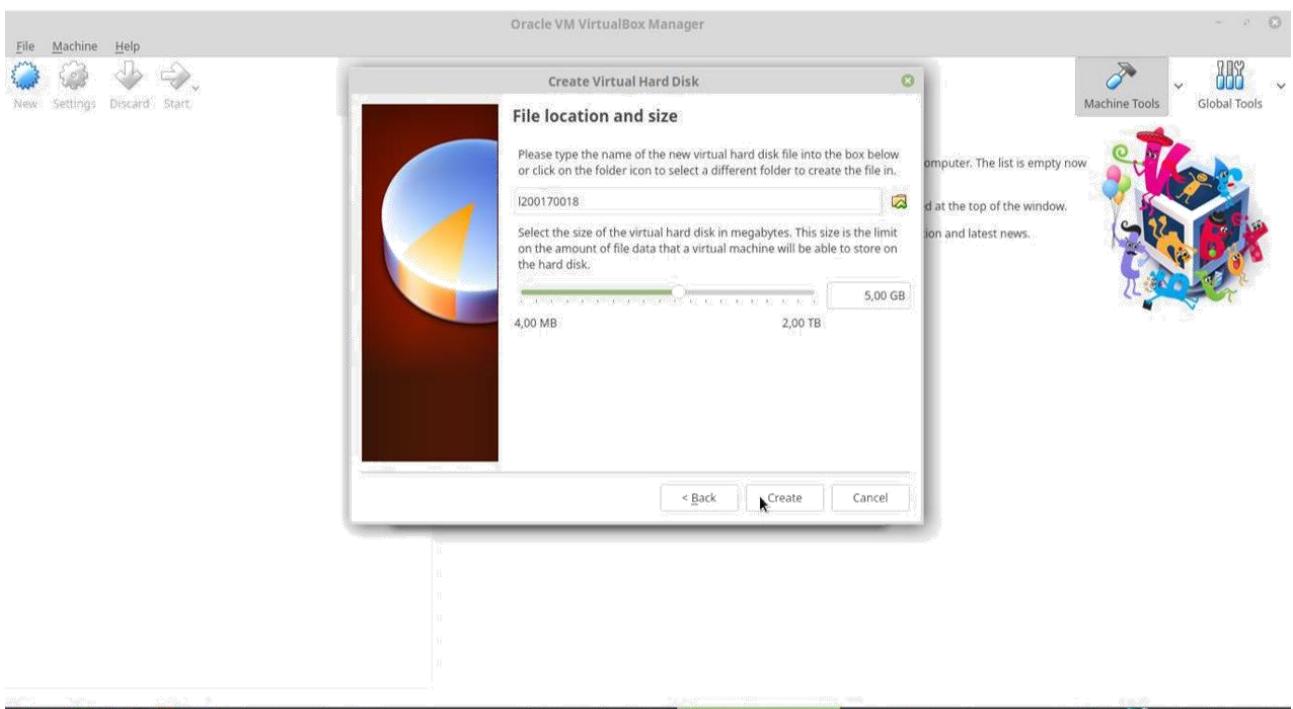
NIM : L200170025

Kelas : B

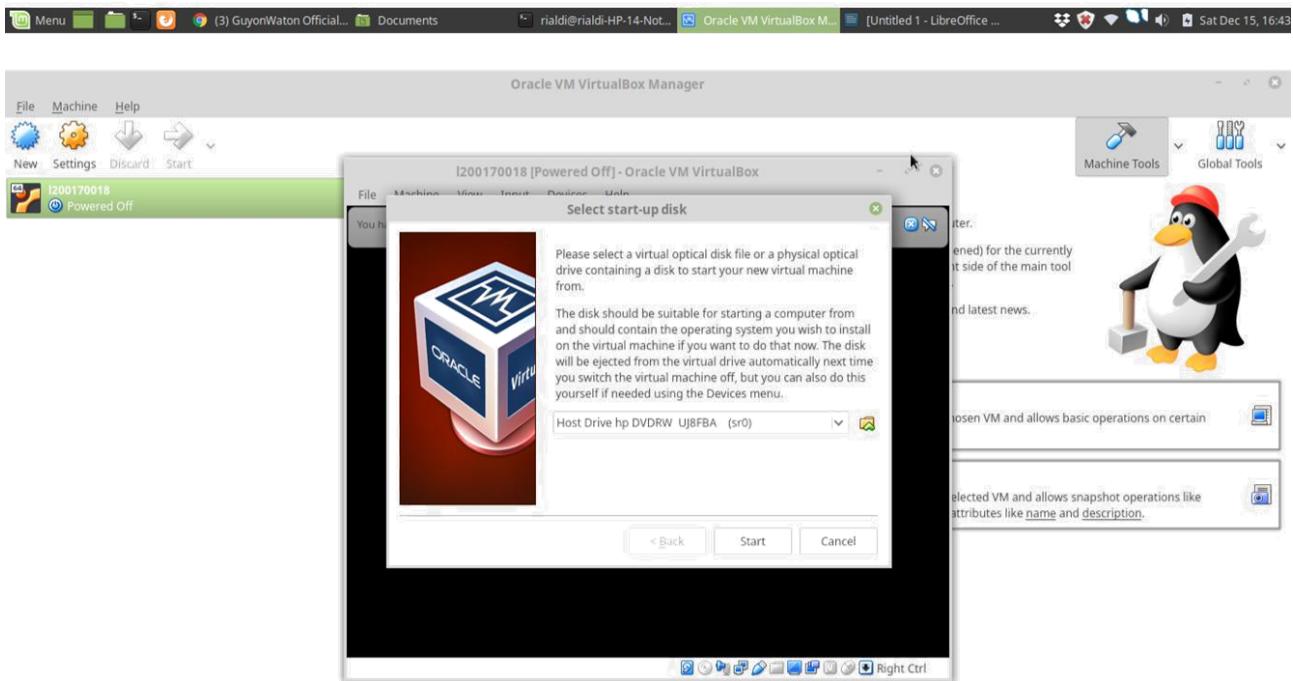
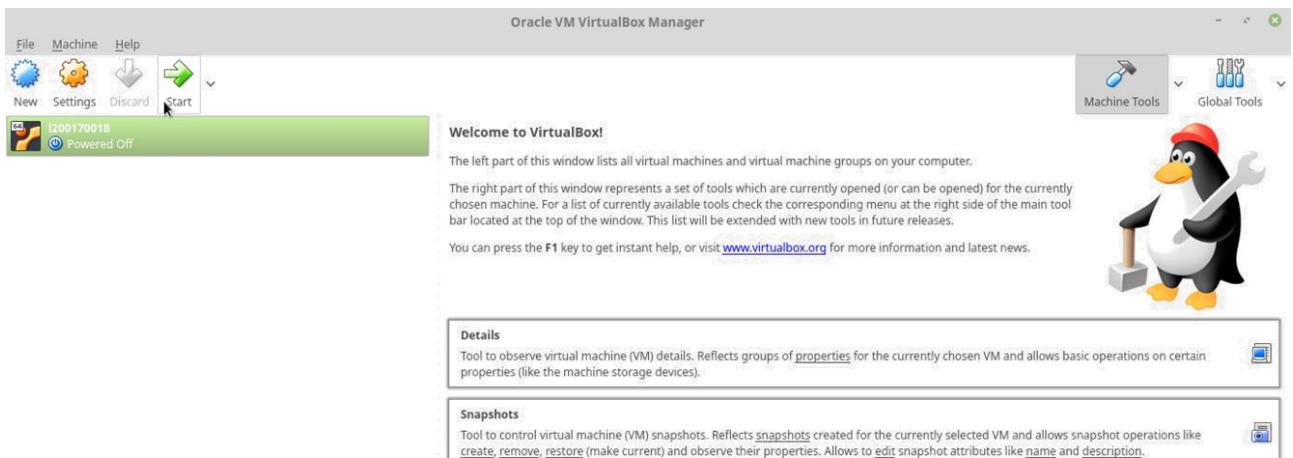


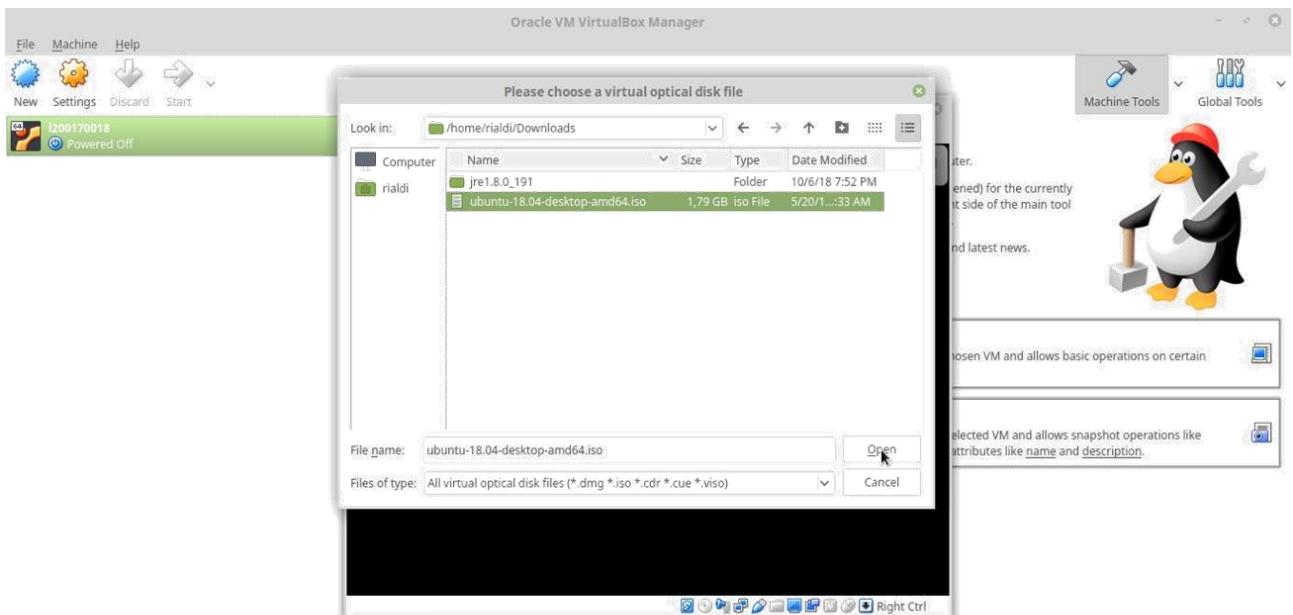


Menu (3) GuyonWatson Official... Documents rialdi@rialdi-HP-14-Notebook ~ Oracle VM VirtualBox Manager Untitled 1 - LibreOffice ... Sat Dec 15, 16:42

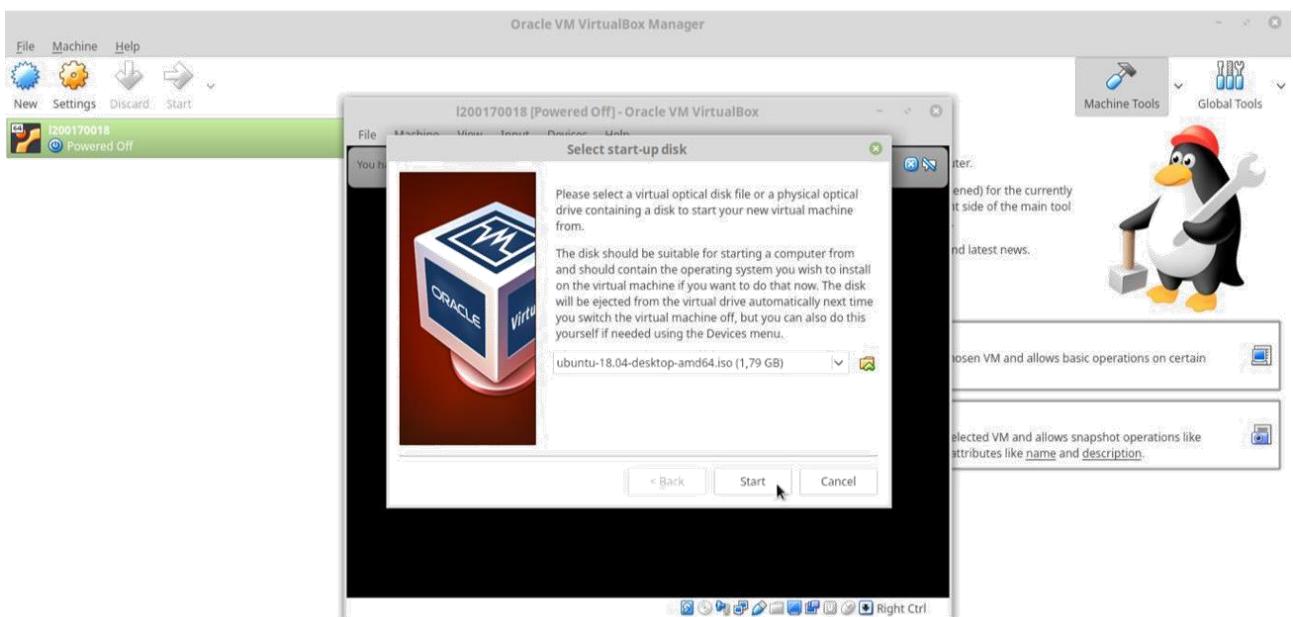


Menu (3) GuyonWatson Official... Documents rialdi@rialdi-HP-14-Notebook ~ Oracle VM VirtualBox Manager Untitled 1 - LibreOffice ... Sat Dec 15, 16:43

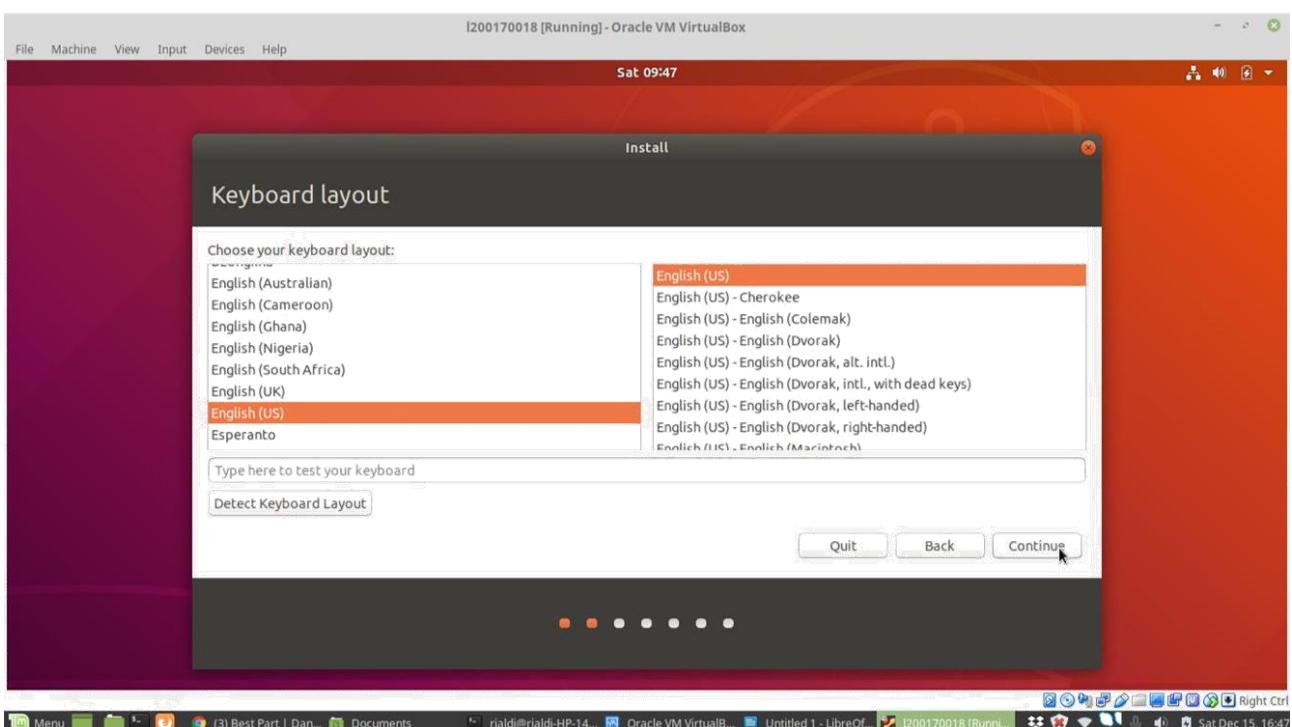
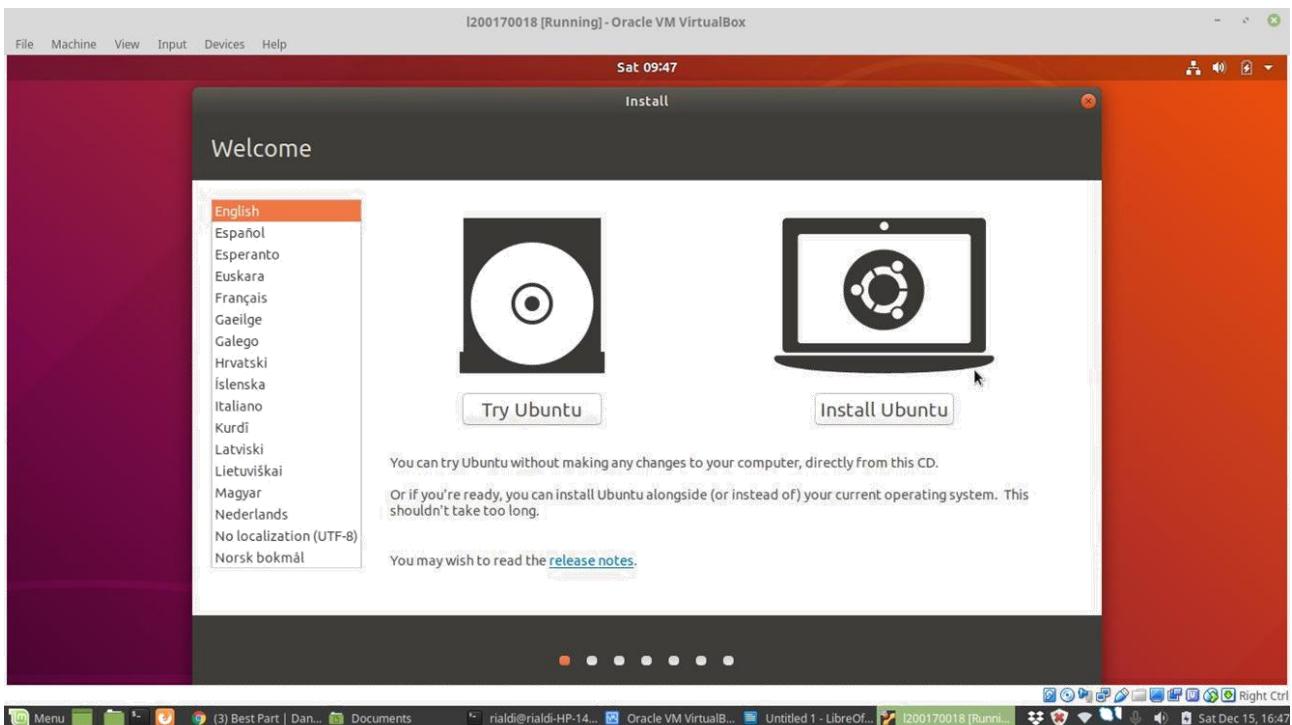


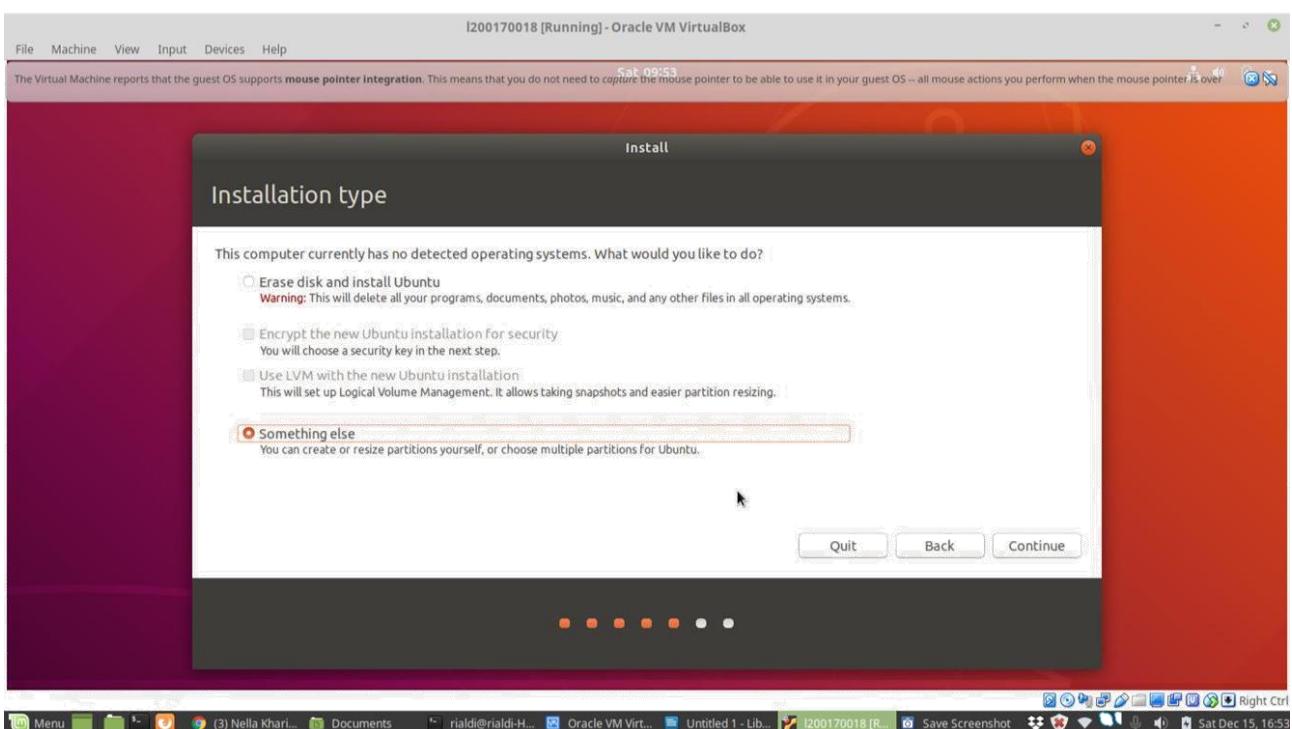
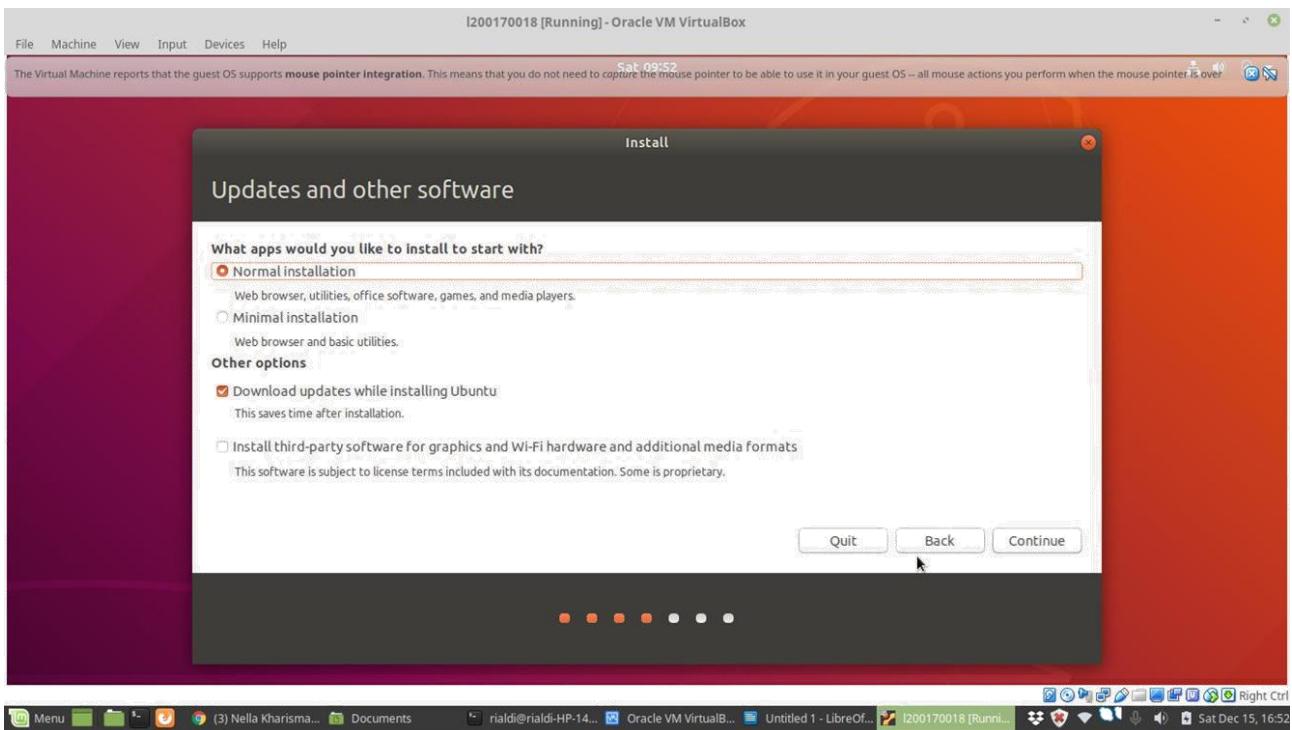


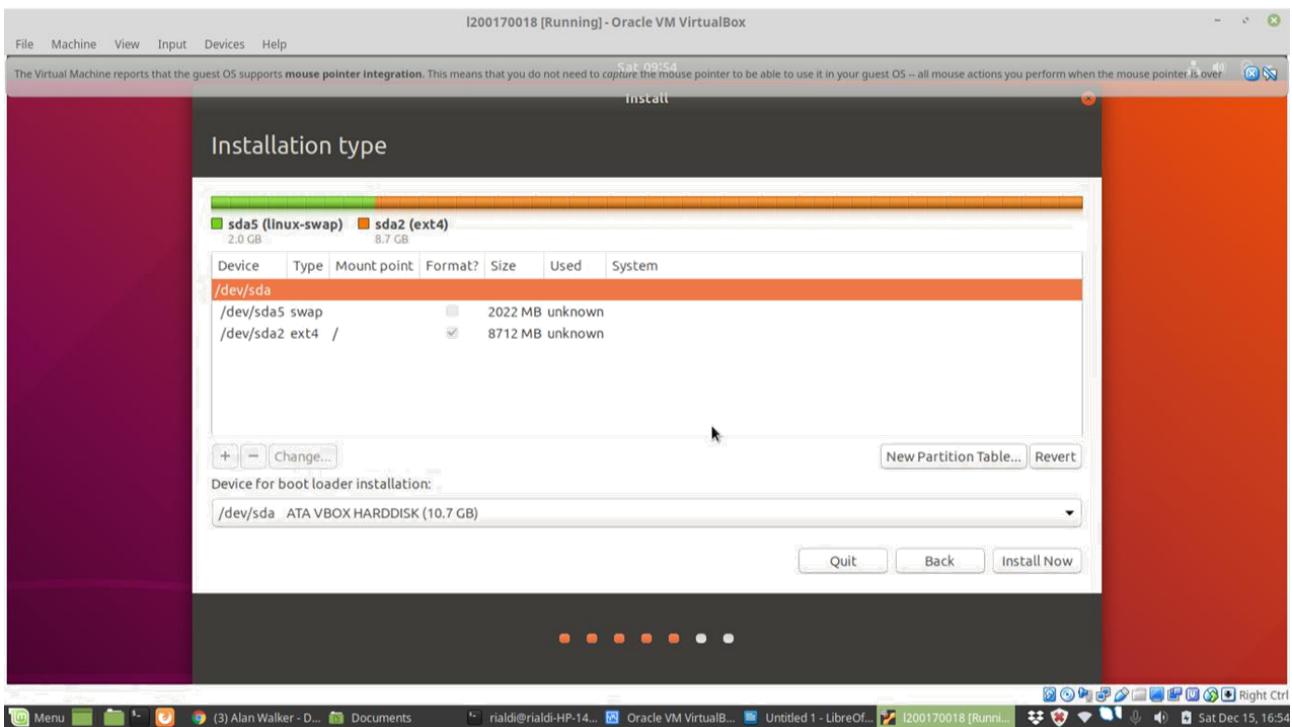
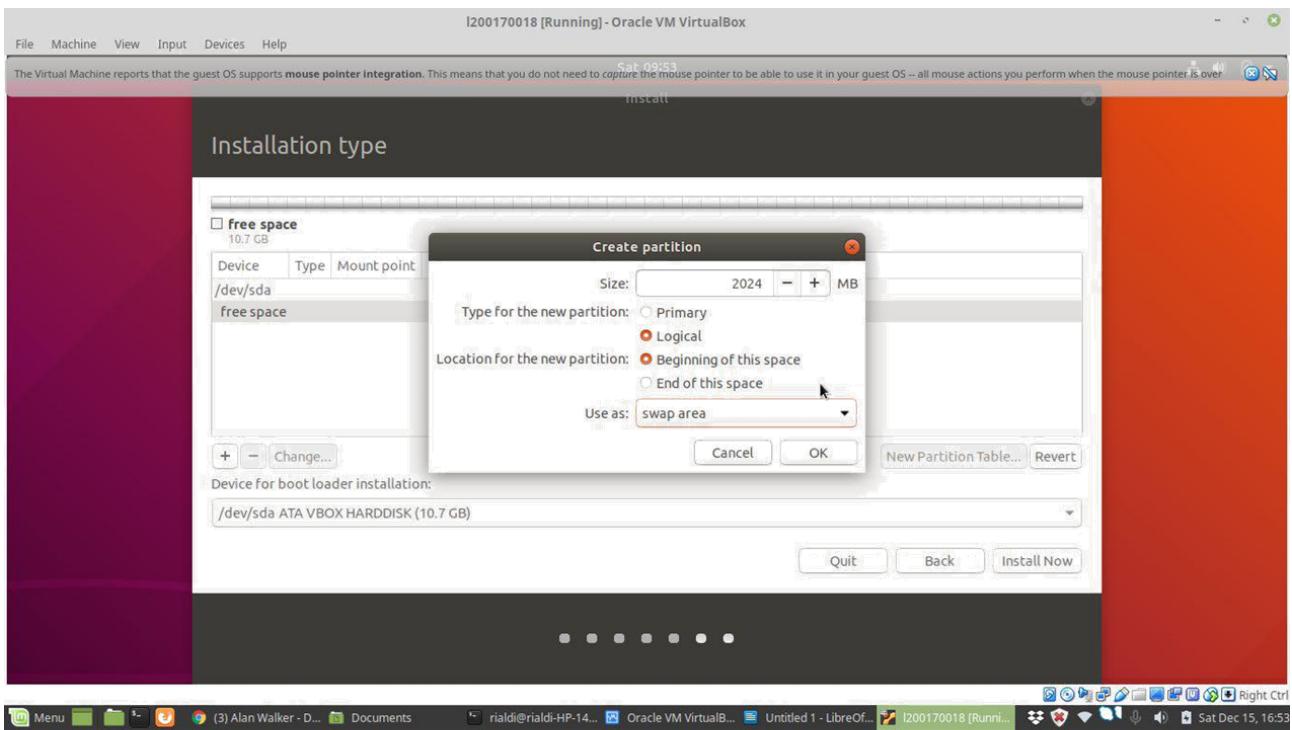
Ubuntu 18.04 LTS - Unity | 64-bit | 1.79 GB | Sat Dec 15, 16:44

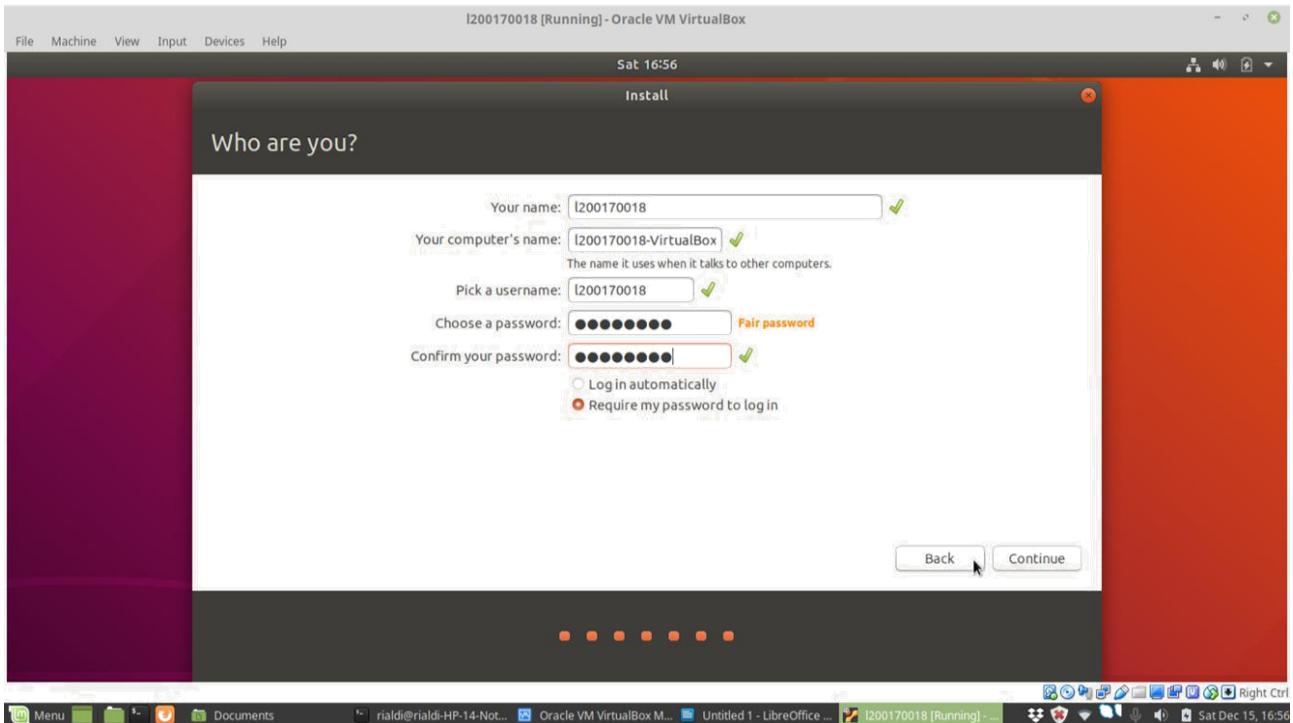
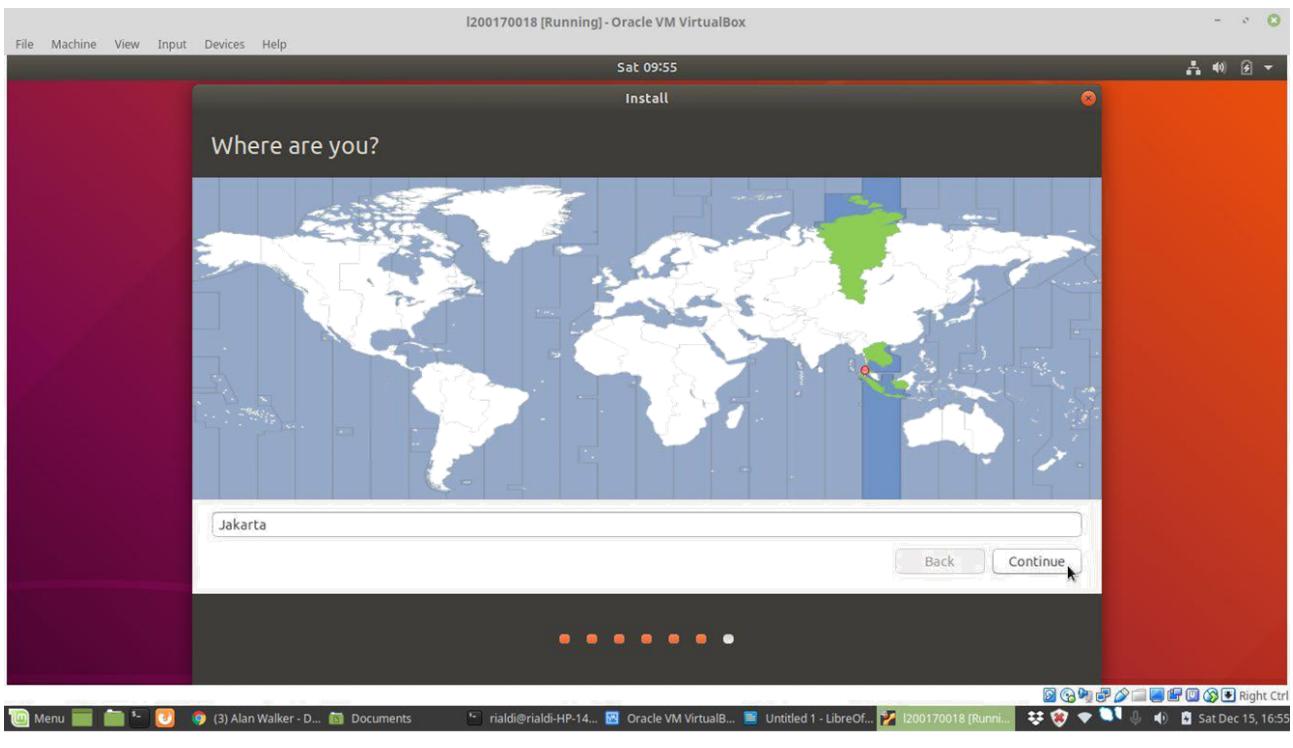


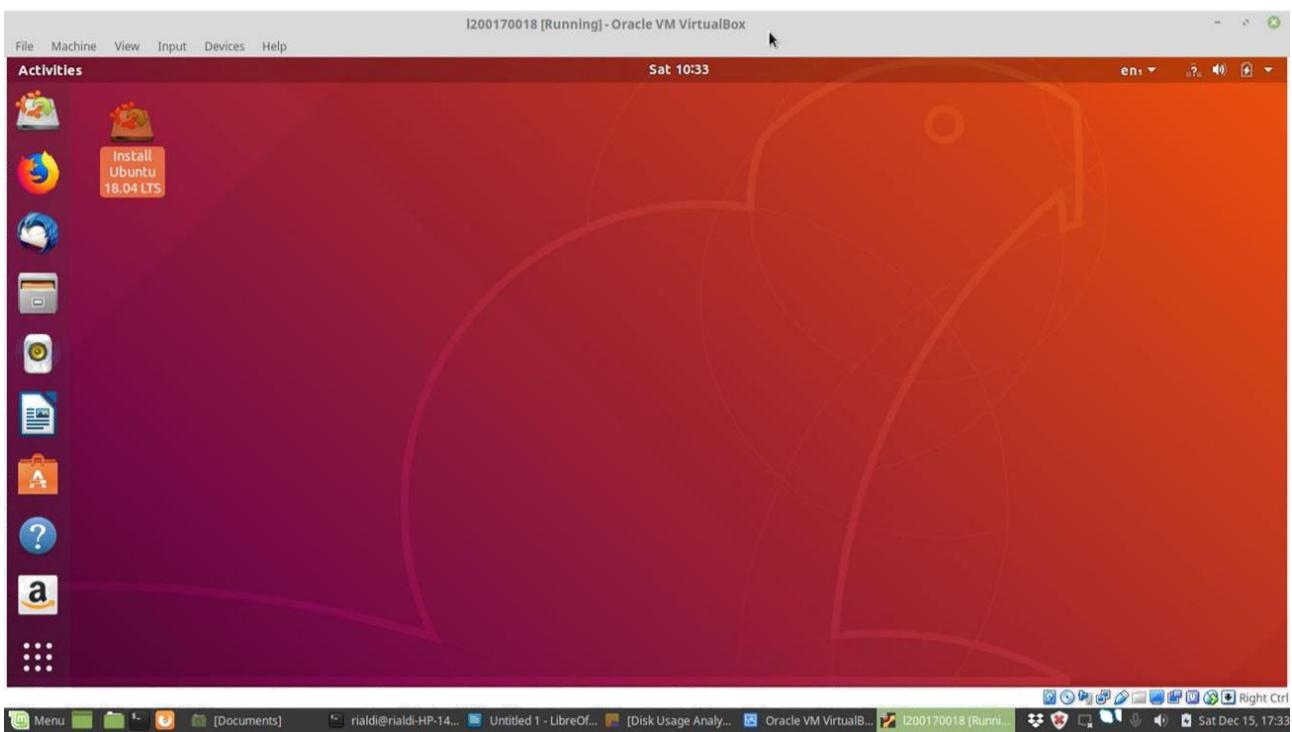
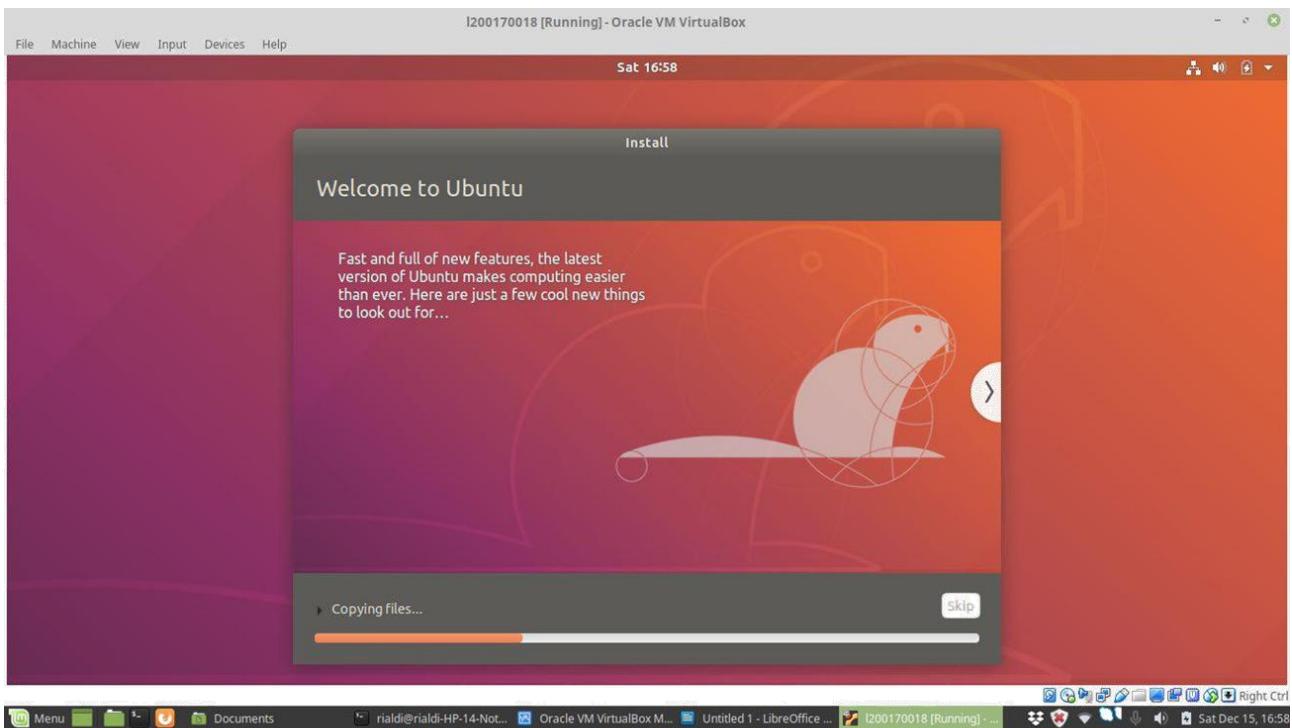
Ubuntu 18.04 LTS - Unity | 64-bit | 1.79 GB | Sat Dec 15, 16:44







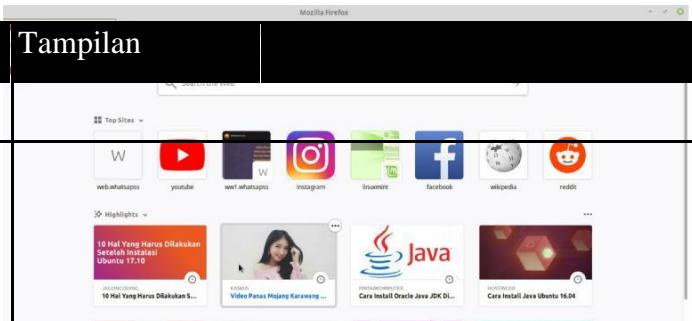
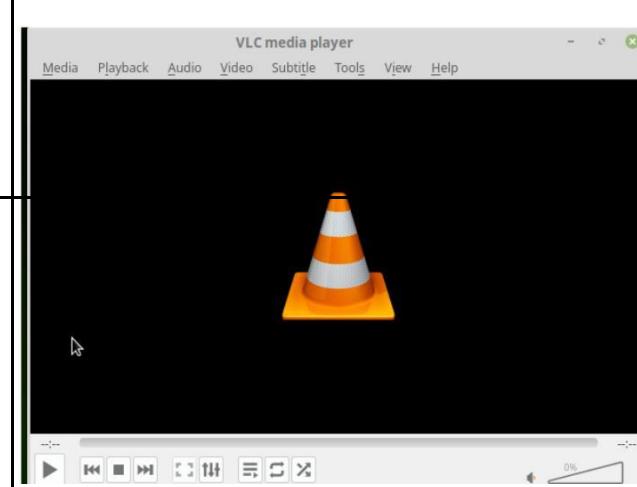
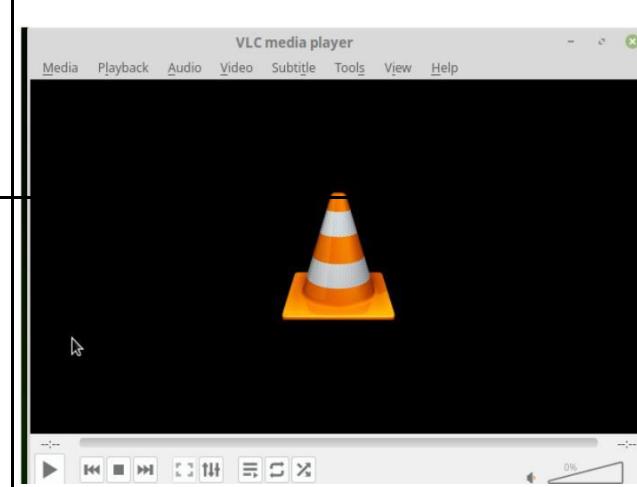




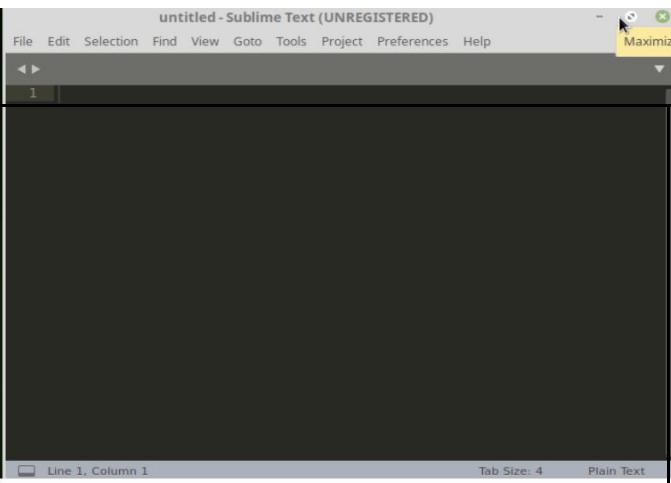
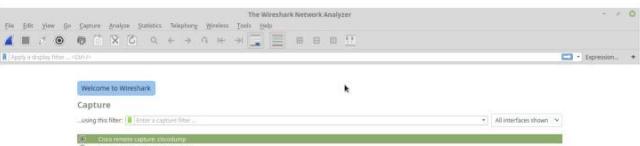
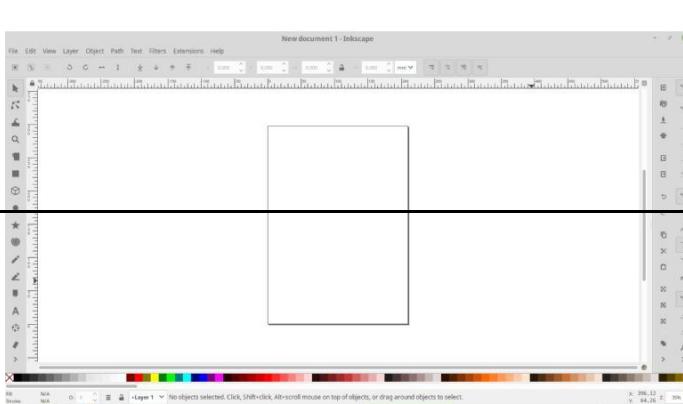
MODUL 6

Nama : Muhammad Izzuddin

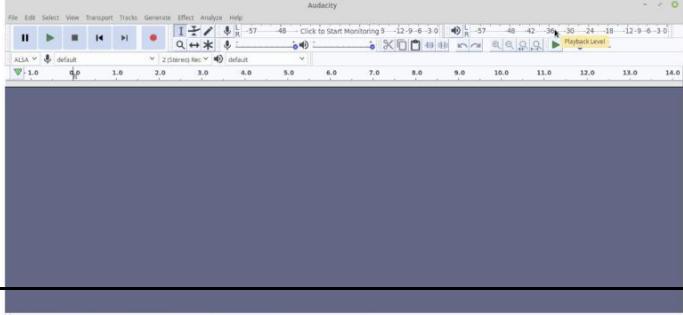
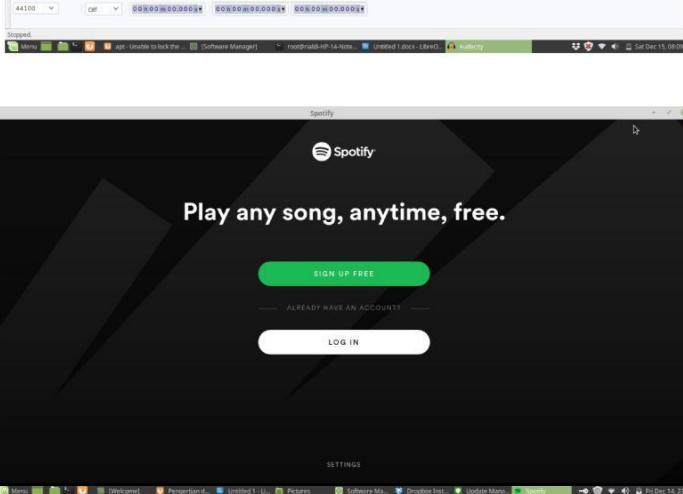
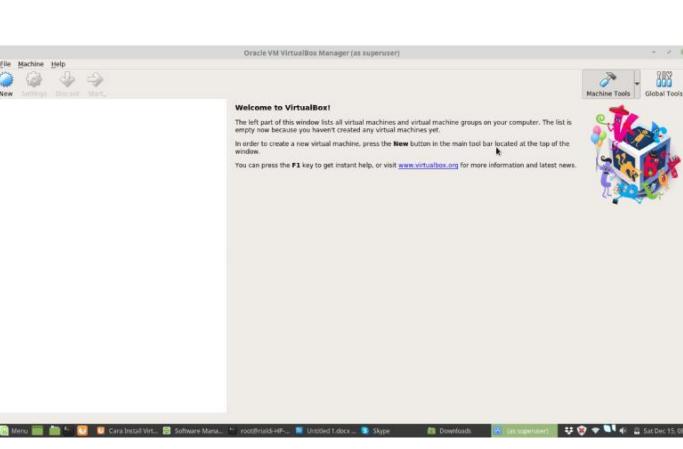
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No Aplikasi	Tampilan	Fungsi
1 Mozilla	 	Sebagai Aplikasi browse
2 Gimp		Sebagai alat pengolah gambar multi-platform.
3 VLC		perangkat lunak (software) pemutar beragam berkas (file) multimedia, baik video maupun audio dalam berbagai format, seperti MPEG, DivX, Ogg, dan lain-lain



4	Sublime Text	
5	Wireshark	 
6	Inkscape	Perangkat lunak editor gambar vektor yang bersifat perangkat lunak bebas di bawah lisensi GNU GPL.
7	Gparted	Sebagai aplikasi manajemen harddisk dengan GUI (Graphical User Interface) untuk sistem operasi linux yang berfungsi sebagai manajemen partisi di



8	Audacity		<p>Program pengolah pengolah Suara/Audio open source (Gratis).</p> <p>Fungsi:</p> <ul style="list-style-type: none"> □ Membuat Ringtone □ Menghilangkan vocal □ Memperlambat/mempercepat tempo lagu □ Menggabungkan dua file audio
9	Spotify		<p>layanan streaming musik digital, podcast, dan video yang memberikan akses ke jutaan lagu dan konten lain dari artis di seluruh dunia.</p>
10	Virtualbox		<p>mem-visualisasi-kan sebuah atau banyak Sistem Operasi (OS) di dalam Sistem Operasi utama kita.</p>