

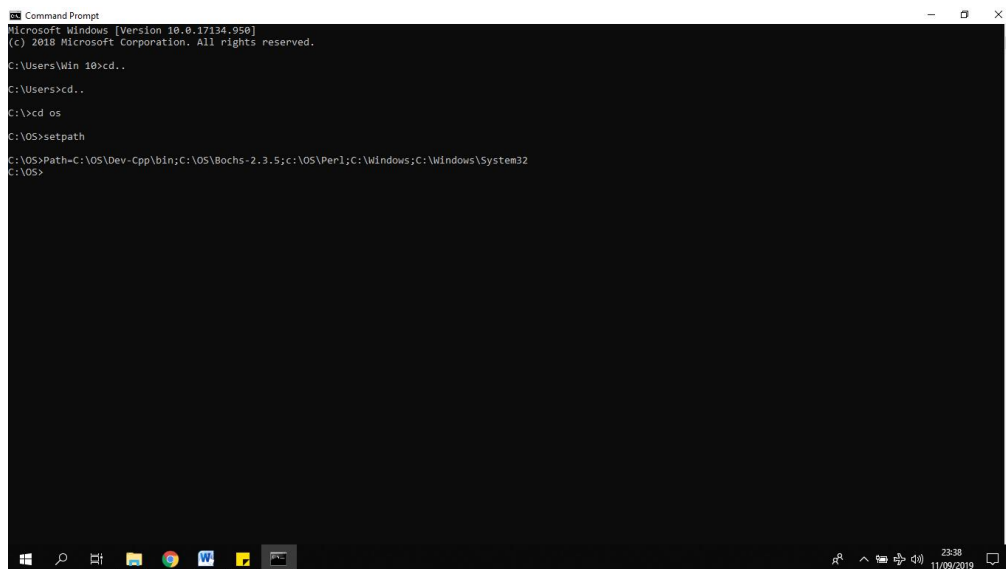
# Laporan

## Modul Praktikum

### Sistem Operasi

## BAB 1. Pengenalan Sistem Pengembangan OS dengan PC Simulator 'Bochs'

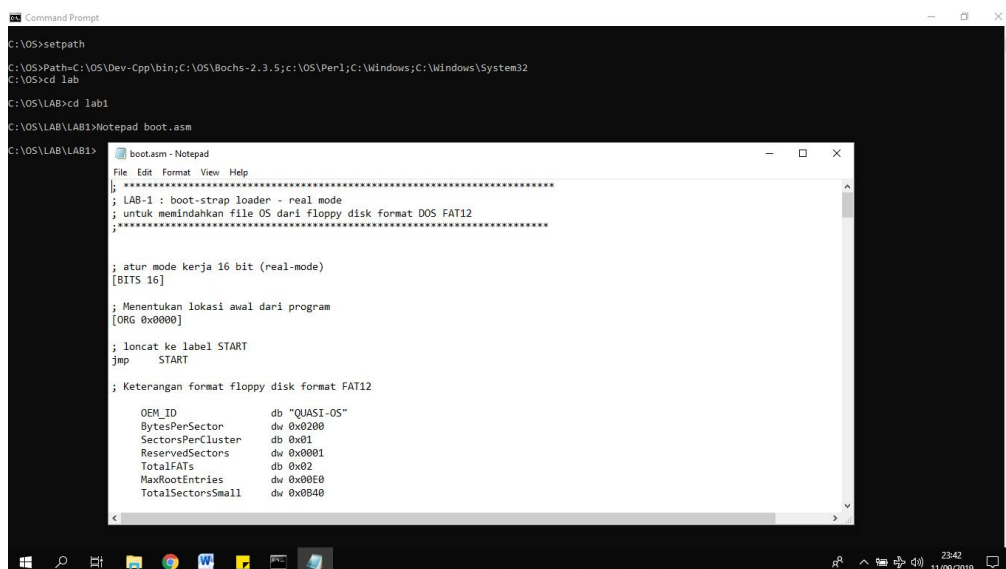
### 1. Menuju direktori kerja



```
Microsoft Windows [Version 10.0.17134.950]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Win 10>cd..
C:\Users>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. Melihat isi direktori kerja



```
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
C:\OS\LAB>cd lab1
C:\OS\LAB\LAB1>Notepad boot.asm
C:\OS\LAB\LAB1>
```

```
bootasm - 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]

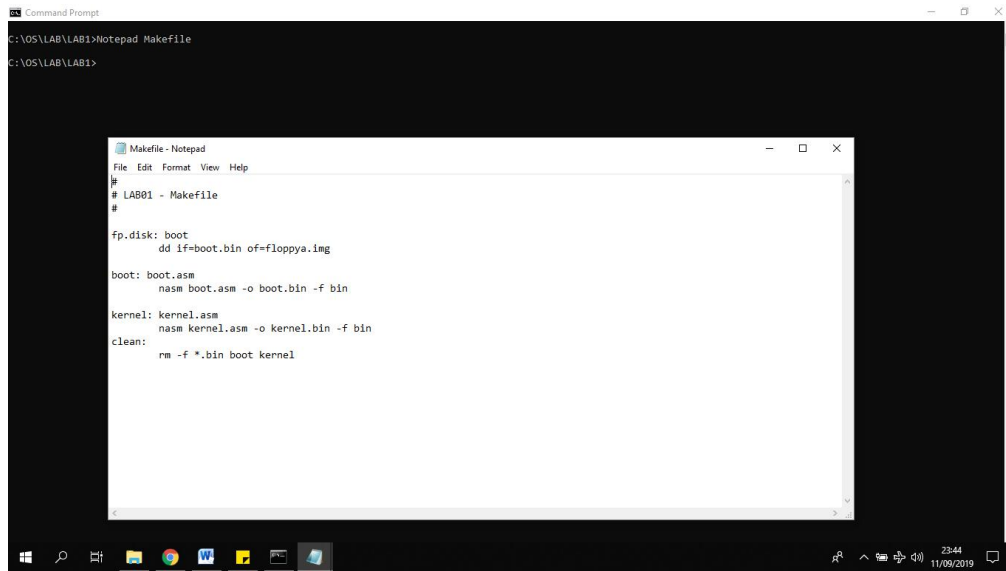
; Menentukan lokasi awal dari program
[ORG 0x0000]

; loncat ke label START
jmp START

; Keterangan format floppy disk format FAT12

OEM_ID          db "QUASI-OS"
BytesPerSector  dw 0x0200
SectorsPerCluster dw 0x01
ReservedSectors dw 0x0001
TotalFATs       dw 0x02
MaxRootEntries  dw 0x00E0
TotalSectorsSmall dw 0x0B40
```

### 3. Sekilas tentang Makefile



```
Command Prompt
C:\OS\LAB\LAB1>Notepad Makefile
C:\OS\LAB\LAB1>

Makefile - Notepad
File Edit Format View Help
#
# LAB01 - Makefile
#

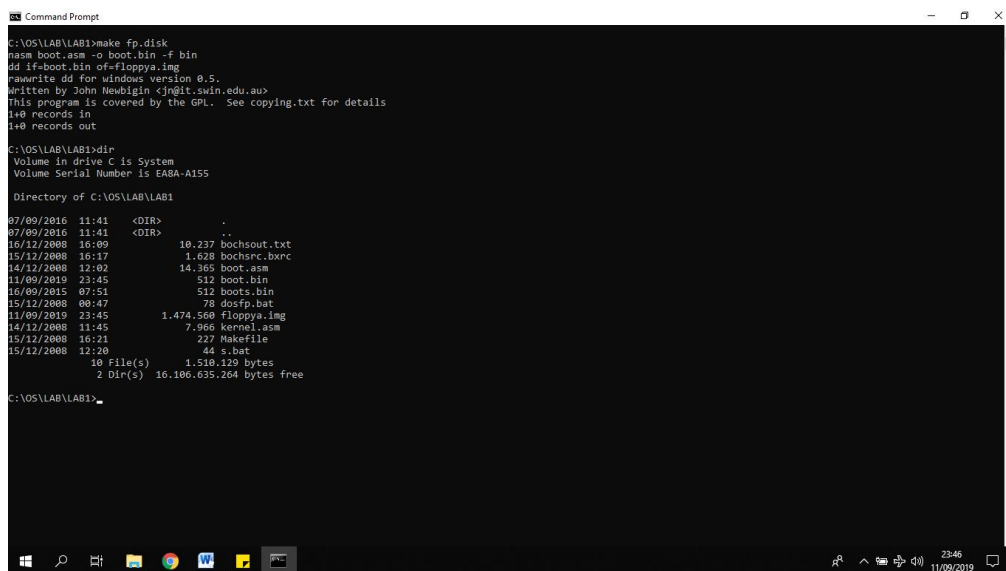
fp.disk: boot
    dd if=boot.bin of=floppya.img

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
```

#### a) Melakukan kompilasi



```
Command Prompt
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 Newbigin <jn@it.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
140 records in
140 records out
1073920 bytes transferred

C:\OS\LAB\LAB1>dir
Volume in drive C is System
Volume Serial Number is EABA-A155

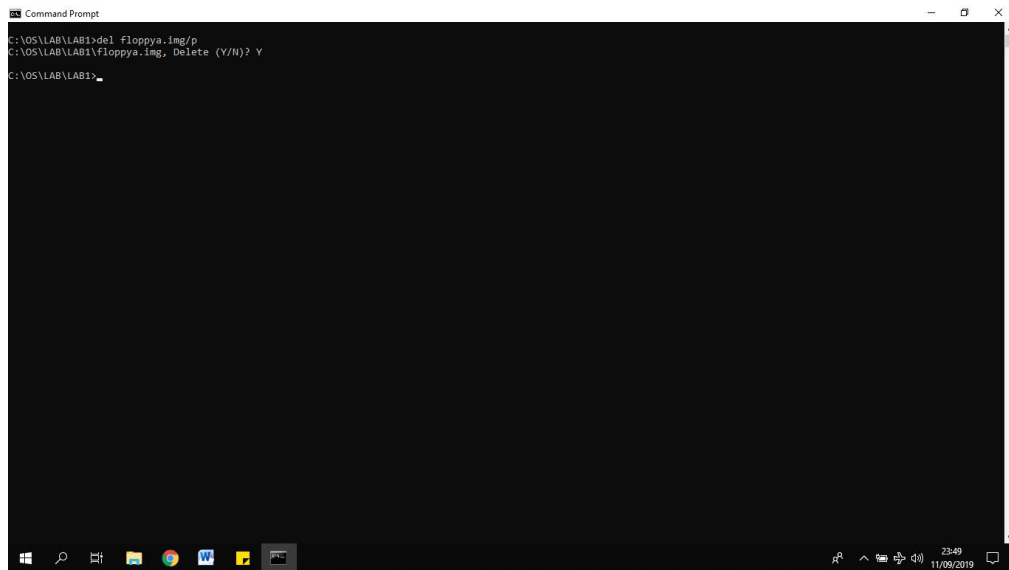
Directory of C:\OS\LAB\LAB1

07/09/2016 11:41 <DIR> .
07/09/2016 11:41 <DIR> ..
10/12/2008 16:09 10.237 bochsout.txt
15/12/2008 16:17 1.628 bochsrc.bxrc
14/12/2008 12:02 14.365 boot.asm
11/09/2019 23:45 512 boot.bin
10/09/2015 07:51 512 boots.bin
15/12/2008 00:47 78 dosfp.bat
11/09/2019 23:45 1.474.560 floppya.img
14/12/2008 11:45 7.966 kernel.asm
15/12/2008 10:21 227 Makefile
15/12/2008 12:20 44 s.bat
               10 File(s) 1.510.129 bytes
               2 Dir(s) 10.106.035.204 bytes free

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

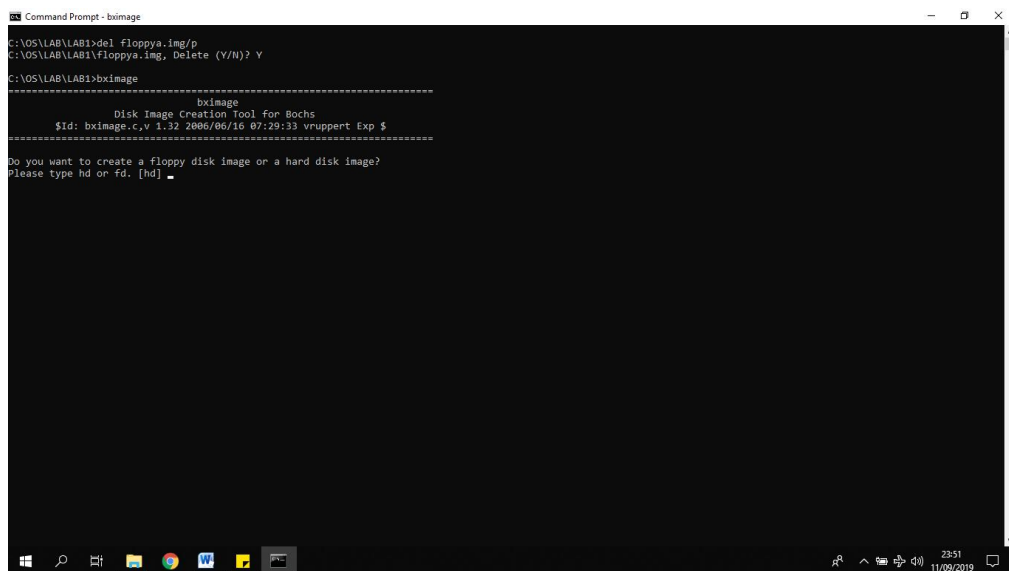
## 4. Mengenal Boot Disk

### a) Membuat file image floppy baru



```
Command Prompt
C:\OS\LAB\LAB1>del floppy.img/p
C:\OS\LAB\LAB1\Floppya.img, Delete (Y/N)? Y
C:\OS\LAB\LAB1>
```

The screenshot shows a Windows Command Prompt window with a black background. The title bar reads "Command Prompt". The command prompt shows the user at the C:\OS\LAB\LAB1 directory, deleting the file floppy.img/p. The system responds with the full path C:\OS\LAB\LAB1\Floppya.img and asks for confirmation to delete (Y/N). The user enters 'Y'. The prompt then returns to the directory path C:\OS\LAB\LAB1>. The Windows taskbar is visible at the bottom with various icons and a system clock showing 23:49 on 11/09/2019.



```
Command Prompt - bxiimage
C:\OS\LAB\LAB1>del floppy.img/p
C:\OS\LAB\LAB1\Floppya.img, Delete (Y/N)? Y
C:\OS\LAB\LAB1>bxiimage
-----
bxiimage
Disk Image Creation Tool for Bochs
$Id: bxiimage.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] _
```

The screenshot shows a Windows Command Prompt window titled "Command Prompt - bxiimage". The user has deleted the floppy image file and is now running the bxiimage command. The command outputs a series of dashes, followed by the tool name "bxiimage", its description "Disk Image Creation Tool for Bochs", and its version information "\$Id: bxiimage.c,v 1.32 2006/06/16 07:29:33 vruppert Exp \$". It then asks the user if they want to create a floppy disk image or a hard disk image, with the instruction "Please type hd or fd. [hd]". The user has entered an underscore character. The Windows taskbar is visible at the bottom with various icons and a system clock showing 23:51 on 11/09/2019.

```
Command Prompt - bximage
C:\OS\LAB\LAB1>del floppy.img/p
C:\OS\LAB\LAB1>floppya.img, Delete (Y/N)? Y
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] _
```

```
Command Prompt - bximage
C:\OS\LAB\LAB1>del floppy.img/p
C:\OS\LAB\LAB1>floppya.img, Delete (Y/N)? Y
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] _
```

```
Command Prompt - bximage
C:\OS\LAB\LAB1>del floppy.img/p
C:\OS\LAB\LAB1>floppy.img, Delete (Y/N)? Y
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] floppy.img
Writing: [] Done.
I wrote 1474560 bytes to floppy.img.
The following line should appear in your bochsrc:
floppy: image="floppy.img", status=inserted
(The line is stored in your windows clipboard, use CTRL-V to paste)
Press any key to continue
```

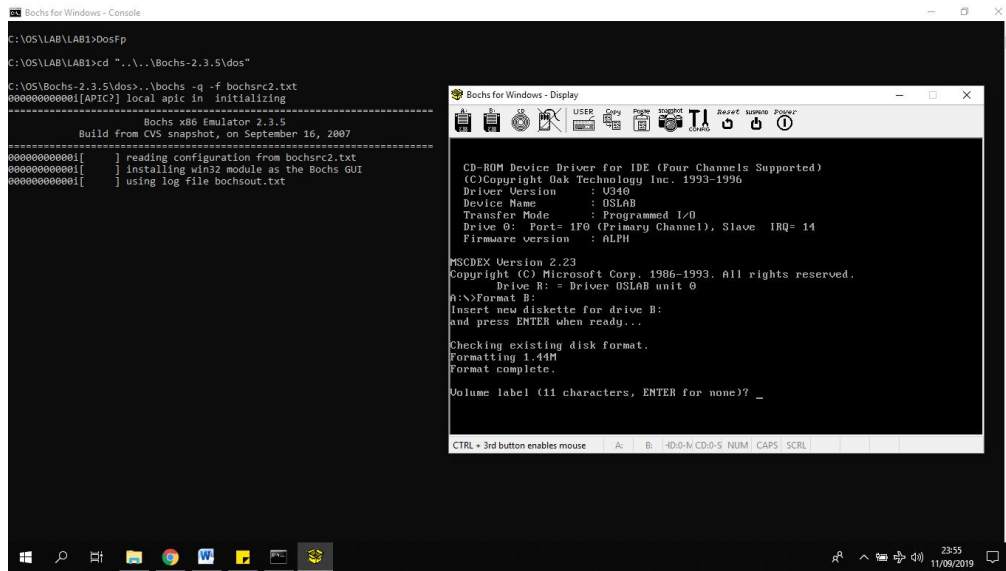
```
Command Prompt
Please type 0.16, 0.18, 0.32, 0.36, 0.72, 1.2, 1.44, 1.68, 1.72, or 2.88.
[1.44]
I will create a floppy image with
cyl=80
heads=2
sectors per track=18
total sectors=2880
total bytes=1474560
What should I name the image?
[a.img] floppy.img
Writing: [] Done.
I wrote 1474560 bytes to floppy.img.
The following line should appear in your bochsrc:
floppy: image="floppy.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 EABA-A155

Directory of C:\OS\LAB\LAB1

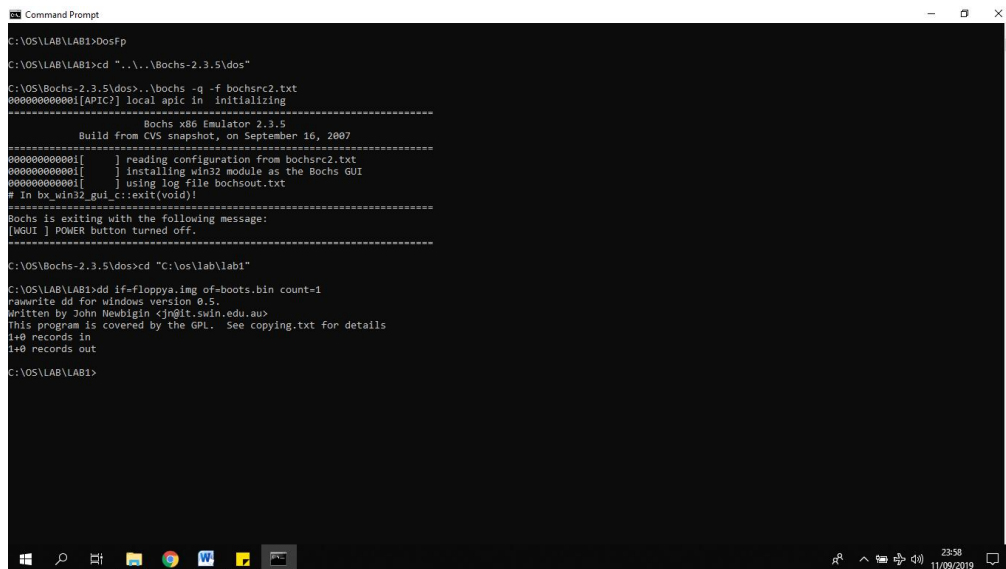
11/09/2019 23:52 <DIR> .
11/09/2019 23:52 <DIR> ..
16/12/2008 16:09 10,237 bochsout.txt
15/12/2008 16:17 1,628 bochsrc.bxrc
14/12/2008 12:02 14,365 boot.asm
11/09/2019 23:45 512 boot.bin
16/09/2015 07:51 512 boots.bin
15/12/2008 00:47 78 dosfp.bat
11/09/2019 23:52 1,474,560 floppy.img
14/12/2008 11:45 7,966 kernel.asm
15/12/2008 16:21 227 Makefile
15/12/2008 12:20 44 s.bat
10 File(s) 1,510,129 bytes
2 Dir(s) 16,105,893,888 bytes free

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

b) Melakukan format terhadap floppy.img



## 5. Melihat data dalam boot sector



```
Command Prompt
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 E6 07 61 8F 4E 4F 20 4E 43 .....s.NO NA
000030: 4D 45 20 20 20 20 46 41 54 31 32 20 20 33 C3 ME FAT12 3.
000040: 8E D1 8C FC 78 16 07 BD 78 00 C5 76 00 1E 56 16 .....{...x..v..V.
000050: 55 BF 22 05 09 7E 00 89 4E 02 81 08 FC F3 A4 06 U".....N.....
000060: 1F 8D 00 7C C6 45 FE 0F 38 4E 24 7D 20 8B C1 99 ...|.E..8N$| ...
000070: E8 7E 01 83 EB 3A 66 A1 1C 7C 66 3B 07 8A 57 FE .....f...f...W.
000080: 75 06 80 CA 02 88 56 02 80 C3 10 73 ED 33 C9 FE u....V...s.3.
000090: 06 D8 7D BA 46 10 98 F7 66 16 03 46 1C 13 56 1E ..|.f...f..F..V.
0000A0: 03 46 0E 13 D1 88 76 11 00 89 46 FC 89 56 FE B8 .F...v..|F..V..
0000B0: 20 00 F7 E6 80 5E 08 03 C3 48 F7 F3 01 46 FC 11 ....^...M...F..?
0000C0: 4E FE 61 BF 00 07 E8 28 01 72 3E 3B 2D 74 17 60 N.a....(p>8-t.
0000D0: 01 08 BE D8 7D F3 A6 61 74 3D 4E 74 09 83 C7 20 ....).at=ht...
0000E0: 3B FB 72 E7 EB D0 FE 0E 08 7D 78 A7 BE 7F 7D AC ;p.....|{...}.
0000F0: 98 03 F0 AC 00 40 74 0C 48 74 13 04 0E 0B 07 00 ....@=ht.....
000100: CD 10 EB EF BE 82 7D EB E6 BE 80 7D EB E1 CD 16 .....}.....
000110: 5E 1F 66 8F 04 CD 19 BE 81 7D 88 7D 1A 80 45 FE ^f.....|.E.
000120: 8A 4E 00 F7 E1 03 46 FC 13 56 FE 81 04 E8 C2 00 .N...f..V.....
000130: 72 07 EA 00 82 76 00 52 58 06 53 6A 01 6A 18 91 n...p.BP$|j..
000140: 88 46 18 A2 26 05 96 92 33 D2 F7 F6 91 F7 F6 42 .F..R...3.....B
000150: 87 CA F7 76 1A BA F2 BA E8 C8 CC 02 0A CC B8 01 ...v.....
000160: 02 80 7E 02 BE 75 04 B4 42 88 F4 BA 56 24 CD 12 ...u..B...V$..
000170: 61 61 72 0A 40 75 01 42 83 5E 08 49 75 77 C3 03 aar@u.B.^Taw..
000180: 18 01 27 0D 0A 49 6E 76 61 6C 69 64 20 73 79 73 ...'.Invalid sys
000190: 74 65 6D 20 64 69 73 68 FF 0D 0A 44 69 73 6B 20 tem disk...Disk
0001A0: 48 2F 4F 20 65 72 72 6F 72 FF 0D 0A 52 65 70 6C I/O error...Reg1
0001B0: 61 63 65 20 74 68 65 20 64 69 73 6B 2C 20 61 6E ace the disk, an
0001C0: 64 20 74 68 65 6E 20 70 72 65 73 73 20 61 6E 79 d then press any
0001D0: 20 68 65 79 0D 0A 00 00 49 4F 20 20 20 20 20 key....IO
0001E0: 53 59 53 4D 53 44 4F 53 20 20 20 53 59 53 7F 01 SYSMSDOS SYS...
0001F0: 00 41 8B 00 07 60 66 6A 00 E9 3B FF 00 00 55 AA .A...fj...U..

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

## 6. 'Boot' PC-Simulator dengan file image 'floppya.img'

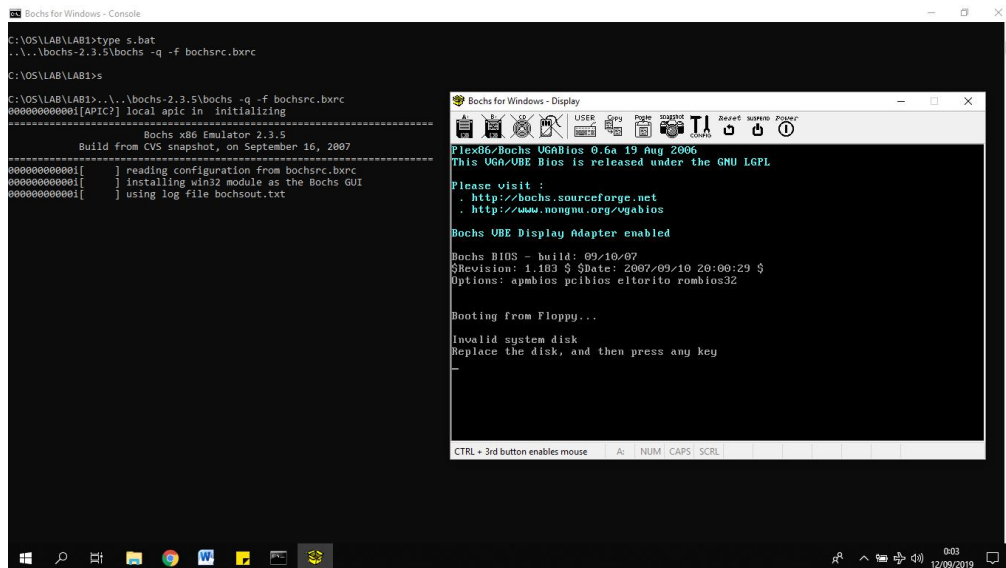
### a) Memanggil PC-Simulator 'Bochs'

```
Command Prompt

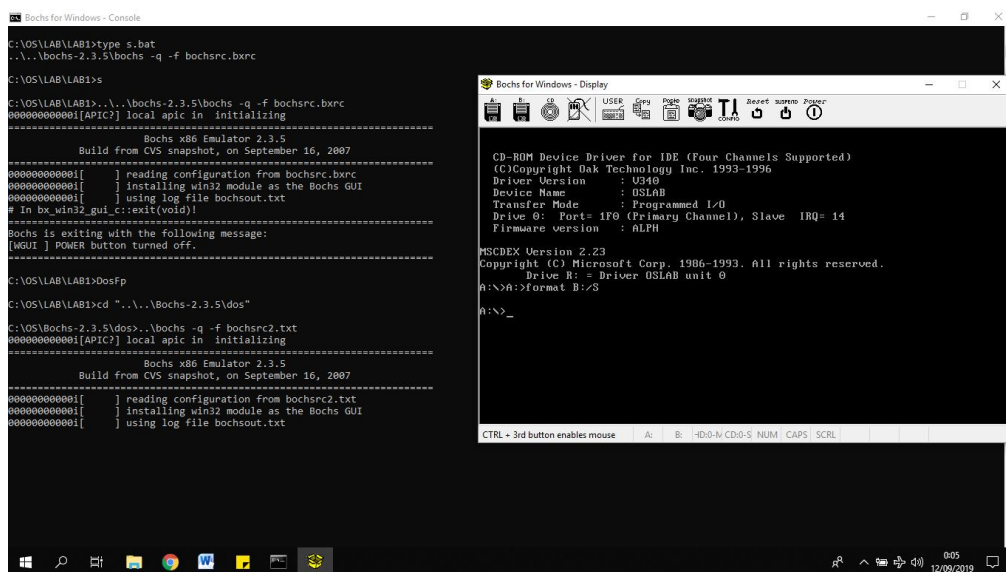
C:\OS\LAB\LAB1>type s.bat
..\..\bochs-2.3.5\bochs -q -f bochsrc.bxrc

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

- b) Menampilkan windows 'Bosch for windows – display' melakukan proses 'booting' namun tidak berhasil karena tidak menemukan diskboot



- c) Melakukan format terhadap 'floppya.img' dan menambahkan 'system file' kedalamnya





- Menampilkan windows 'Bochs for windows – display' melakukan proses 'booting'

