

**Nama : Alfian Syahrani**  
**NIM : L200170038**  
**Kelas : B**

## Langkah kerja

CA Command Prompt

```
C:\Users>cd..

C:\>cd os

C:\OS>dir
Volume in drive C has no label.
Volume Serial Number is 442E-B75C

Directory of C:\OS

09/12/2018  02:04 AM  <DIR>          .
09/12/2018  02:04 AM  <DIR>          ..
09/12/2018  02:04 AM  <DIR>          Bochs-2.3.5
09/11/2016  10:33 PM              0 bximage
09/12/2018  02:04 AM  <DIR>          Dev-Cpp
12/17/2008  12:08 AM             1,096,291 i386.pdf
09/12/2018  02:04 AM  <DIR>          LAB
12/17/2008  12:07 AM             846,920 pcasm-book.pdf
12/17/2008  01:44 AM              86 Setpath.bat
12/13/2008  02:12 PM             716,512 winima81.exe
               5 File(s)              2,659,809 bytes
               5 Dir(s)  186,848,178,176 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

C:\OS\LAB>cd lab1

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 0x0B40  
    MediaDescriptor    db 0xF0  
    SectorsPerFAT      dw 0x0009  
    SectorsPerTrack    dw 0x0012  
    NumHeads           dw 0x0002  
    HiddenSectors      dd 0x00000000  
    TotalSectorsLarge  dd 0x00000000
```

CA: Command Prompt

```
C:\>cd os
C:\OS>dir
Volume in drive C has no label.
Volume Serial Number is 442E-B75C

Directory of C:\OS

09/12/2018  02:04 AM    <DIR>
09/12/2018  02:04 AM    <DIR>
09/12/2018  02:04 AM    <DIR>
09/11/2016  10:33 PM
09/12/2018  02:04 AM    <DIR>
12/17/2008  12:08 AM    1,096,29
09/12/2018  02:04 AM    <DIR>
12/17/2008  12:07 AM    846,92
12/17/2008  01:44 AM
12/13/2008  02:12 PM    716,52
                    5 File(s)      2,659,4
                    5 Dir(s)   186,848,178
```

```
C:\OS>setpath
```

```
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\B
C:\OS>cd lab
```

```
C:\OS\LAB>cd lab1
```

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

```
C:\OS\LAB\LAB1>notepad makefile
'notepad' is not recognized as an in
operable program or batch file.
```

```
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 Newbigin <jn@it.swin
This program is covered by the GPL.
1+0 records in
1+0 records out
```

```
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
```

CA: 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
1+0 records in
1+0 records out

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

CA: Command Prompt

```
C:\OS\LAB\LAB1>del floppy.img

C:\OS\LAB\LAB1>dir
Volume in drive C has no label.
Volume Serial Number is 442E-B75C

Directory of C:\OS\LAB\LAB1

09/12/2018  02:32 AM    <DIR>          .
09/12/2018  02:32 AM    <DIR>          ..
09/11/2017  10:48 AM             8,358 bochsout.txt
12/15/2008  04:17 PM             1,628 bochsrc.bxrc
10/17/2016  02:36 PM            14,339 boot.asm
09/12/2018  02:30 AM              512 boot.bin
09/11/2017  10:37 AM              512 boots.bin
09/16/2007  04:22 PM            18,432 bximage.exe
09/11/2017  10:21 AM          10,321,920 c.img
02/26/2007  08:50 PM            342,016 dd.exe
12/15/2008  12:47 AM              78 dosfp.bat
12/14/2008  11:45 AM            7,966 kernel.asm
12/15/2008  04:21 PM              227 Makefile
12/15/2008  12:20 PM              44 s.bat
01/31/2000  05:00 AM           261,120 tdump.exe
               13 File(s)        10,977,152 bytes
               2 Dir(s)  186,903,248,896 bytes free

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

CA: Command Prompt

```
C:\OS\LAB\LAB1>make clean
rm -f *.bin boot kernel

C:\OS\LAB\LAB1>dir
Volume in drive C has no label.
Volume Serial Number is 442E-B75C

Directory of C:\OS\LAB\LAB1

09/12/2018  02:33 AM    <DIR>          .
09/12/2018  02:33 AM    <DIR>          ..
09/11/2017  10:48 AM             8,358 bochsout.txt
12/15/2008  04:17 PM             1,628 bochsrc.bxrc
10/17/2016  02:36 PM            14,339 boot.asm
09/16/2007  04:22 PM            18,432 bximage.exe
09/11/2017  10:21 AM          10,321,920 c.img
02/26/2007  08:50 PM            342,016 dd.exe
12/15/2008  12:47 AM              78 dosfp.bat
12/14/2008  11:45 AM            7,966 kernel.asm
12/15/2008  04:21 PM              227 Makefile
12/15/2008  12:20 PM              44 s.bat
01/31/2000  05:00 AM           261,120 tdump.exe
               11 File(s)        10,976,128 bytes
               2 Dir(s)  186,903,244,800 bytes free

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

Command Prompt

```
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:
    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 has no label.
Volume Serial Number is 442E-B75C

Directory of C:\OS\LAB\LAB1

09/12/2018  02:35 AM    <DIR>          .
09/12/2018  02:35 AM    <DIR>          ..
09/11/2017  10:48 AM                8,358 bochsout.txt
12/15/2008  04:17 PM                1,628 bochsrc.bxrc
10/17/2016  02:36 PM                14,339 boot.asm
09/16/2007  04:22 PM                18,432 bximage.exe
09/11/2017  10:21 AM            10,321,920 c.img
02/26/2007  08:50 PM                342,016 dd.exe
12/15/2008  12:47 AM                 78 dosfp.bat
09/12/2018  02:35 AM            1,474,560 floppya.img
12/14/2008  11:45 AM                 7,966 kernel.asm
12/15/2008  04:21 PM                 227 Makefile
-----
```



```
Bochs for Windows - Console
09/12/2018 02:35 AM <DIR> ..
09/11/2017 10:48 AM      8,358 bochsout.txt
12/15/2008 04:17 PM      1,628 bochsrc.bxrc
10/17/2016 02:36 PM      14,339 boot.asm
09/16/2007 04:22 PM      18,432 bximage.exe
09/11/2017 10:21 AM    10,321,920 c.img
02/26/2007 08:50 PM    342,016 dd.exe
12/15/2008 12:47 AM       78 dosfp.bat
09/12/2018 02:35 AM    1,474,560 floppy.a.img
12/14/2008 11:45 AM      7,966 kernel.asm
12/15/2008 04:21 PM       227 Makefile
12/15/2008 12:20 PM        44 s.bat
01/31/2000 05:00 AM    261,120 tdump.exe
      12 File(s)      12,450,688 bytes
      2 Dir(s)      186,901,659,648 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
00000000000i[APIC?] local apic in  initializing
=====
                Bochs x86 Emulator 2.3.5
                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

Bochs for Windows - Display
=====
CD-ROM Device Driver for IDE (Four Channels Supported)
(C)Copyright Oak Technology Inc. 1993-1996
Driver Version      : V340
Device Name         : OSLAB
Transfer Mode       : Programmed I/O
Drive 0: Port= 1F0 (Primary Channel), Slave  IRQ= 14
Firmware version   : ALPH

MSCDEX Version 2.23
Copyright (C) Microsoft Corp. 1986-1993. All rights reserved.
Drive R: = Driver OSLAB unit 0
A:\>_
```

```
Bochs for Windows - Console
09/12/2018 02:35 AM <DIR> ..
09/11/2017 10:48 AM      8,358 bochsout.txt
12/15/2008 04:17 PM      1,628 bochsrc.bxrc
10/17/2016 02:36 PM      14,339 boot.asm
09/16/2007 04:22 PM      18,432 bximage.exe
09/11/2017 10:21 AM    10,321,920 c.img
02/26/2007 08:50 PM    342,016 dd.exe
12/15/2008 12:47 AM       78 dosfp.bat
09/12/2018 02:35 AM    1,474,560 floppy.a.img
12/14/2008 11:45 AM      7,966 kernel.asm
12/15/2008 04:21 PM       227 Makefile
12/15/2008 12:20 PM        44 s.bat
01/31/2000 05:00 AM    261,120 tdump.exe
      12 File(s)      12,450,688 bytes
      2 Dir(s)      186,901,659,648 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
00000000000i[APIC?] local apic in  initializing
=====
                Bochs x86 Emulator 2.3.5
                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

Bochs for Windows - Display
=====
CD-ROM Device Driver for IDE (Four Channels Supported)
(C)Copyright Oak Technology Inc. 1993-1996
Driver Version      : V340
Device Name         : OSLAB
Transfer Mode       : Programmed I/O
Drive 0: Port= 1F0 (Primary Channel), Slave  IRQ= 14
Firmware version   : ALPH

MSCDEX Version 2.23
Copyright (C) Microsoft Corp. 1986-1993. All rights reserved.
Drive R: = Driver OSLAB unit 0
A:\>_

A:\>Format B
Parameter format not correct - B

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

Checking existing disk format.
Formatting 1.44M
Format complete.

C:\>
C:\>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 1F23-0AF7
Format another (Y/N)?n

A:\>_

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

CA Command Prompt

(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 has no label.  
Volume Serial Number is 442E-B75C

Directory of C:\OS\LAB\LAB1

```
09/12/2018  02:35 AM  <DIR>          .
09/12/2018  02:35 AM  <DIR>          ..
09/11/2017  10:48 AM                8,358 bochsout.txt
12/15/2008  04:17 PM                1,628 bochsrc.bxrc
10/17/2016  02:36 PM               14,339 boot.asm
09/16/2007  04:22 PM               18,432 bximage.exe
09/11/2017  10:21 AM            10,321,920 c.img
02/26/2007  08:50 PM               342,016 dd.exe
12/15/2008  12:47 AM                 78 dosfp.bat
09/12/2018  02:35 AM          1,474,560 floppy.img
12/14/2008  11:45 AM               7,966 kernel.asm
12/15/2008  04:21 PM                 227 Makefile
12/15/2008  12:20 PM                 44 s.bat
01/31/2000  05:00 AM          261,120 tdump.exe
                12 File(s)      12,450,688 bytes
                2 Dir(s)  186,901,659,648 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  
00000000000i[APIC?] local apic in initializing

```
=====
Bochs x86 Emulator 2.3.5
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
# 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>debug boots.bin

'debug' is not recognized as an internal or external command,  
operable program or batch file.

CA 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 00 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 E7 0F 15 2C 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 08 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$} ...
000070: E8 7E 01 83 EB 3A 66 A1 1C 7C 66 3B 07 8A 57 FC ~....f...|f;..W.
000080: 75 06 80 CA 02 88 56 02 80 C3 10 73 ED 33 C9 FE u....V....s.3..
000090: 06 D8 7D 8A 46 10 98 F7 66 16 03 46 1C 13 56 1E ..}.F...f..F..V.
0000A0: 03 46 0E 13 D1 8B 76 11 60 89 46 FC 89 56 FE B8 .F...v..F..V..
0000B0: 20 00 F7 E6 88 5E 08 03 C3 48 F7 F3 01 46 FC 11 ....^..H..F..
0000C0: 4E FE 61 BF 00 07 E8 28 01 72 3E 38 2D 74 17 60 N.a....(r>8-t.
0000D0: 81 08 BE D8 7D F3 A6 61 74 3D 4E 74 09 83 C7 20 ...}.at=Nt...
0000E0: 3B FB 72 E7 EB DD FE 0E D8 7D 7B A7 BE 7F 7D AC ;r.....}{...}.
0000F0: 98 03 F0 AC 98 40 74 0C 48 74 13 B4 0E BB 07 00 .....@t.Ht.....
000100: CD 10 EB EF BE 82 7D EB E6 BE 80 7D EB E1 CD 16 .....}......}..E.
000110: 5E 1F 66 8F 04 CD 19 BE 81 7D 8B 7D 1A 8D 45 FE ^.f.....}.E.
000120: 8A 4E 0D F7 E1 03 46 FC 13 56 FE B1 04 E8 C2 00 .N...F..V.....
000130: 72 D7 EA 00 02 70 00 52 50 06 53 6A 01 6A 10 91 r....p.RP.Sj..
000140: 8B 46 18 A2 26 05 96 92 33 D2 F7 F6 91 F7 F6 42 .F.&...3.....B
000150: 87 CA F7 76 1A 8A F2 8A E8 C0 CC 02 0A CC B8 01 ...v.....
000160: 02 80 7E 02 0E 75 04 B4 42 8B F4 8A 56 24 CD 13 ~..u..B...V$.
000170: 61 61 72 0A 40 75 01 42 03 5E 0B 49 75 77 C3 03 aar.@u.B.^Iuw...
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 68 20 tem disk...Disk
0001A0: 49 2F 4F 20 65 72 72 6F 72 FF 0D 0A 52 65 70 6C I/O error...Repl
0001B0: 61 63 65 20 74 68 65 20 64 69 73 68 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 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 BB 00 07 60 66 6A 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>

# Bochs for Windows - Console

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

C:\OS\LAB\LAB1>s

C:\OS\LAB\LAB1>..\..\bochs-2.3.5\bochs -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 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>DosFp

C:\OS\LAB\LAB1>cd "..\..\Bochs-2.3.5\dos"
```

## Bochs for Windows - Display

Drive R: = Driver OSLAB unit 0

```
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)?

    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 2E0D-0AE5

Format another (Y/N)?n
```

## Bochs for Windows - Console

```
[WGUI] Bochs for Windows - Display
=====
C:\>
C:\>Volume label (11 characters, ENTER for none)?
C:\>    1,457,664 bytes total disk space
0000    221,696 bytes used by system
0000    1,235,968 bytes available on disk
-----
    512 bytes in each allocation unit.
    2,414 allocation units available on disk.
0000
0000Volume Serial Number is 1A1B-0AE9
0000
# I
0000Format another (Y/N)?n
-----
[MG] A:\>dir b:
-----
Volume in drive B has no label
Volume Serial Number is 1A1B-0AE9
C:\>Directory of B:\
C:\>
COMMAND  COM      94,292  05-05-03  21:22
C:\>    1 file(s)      94,292 bytes
    0 dir(s)      1,235,968 bytes free
C:\>
A:\>
=====
                Bochs x86 Emulator 2.3.5
                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
```



# Hasil akhir booting

```
C:\> Bochs for Windows - Console
00000000000i[APIC?] local apic in  initializing
=====
                Bochs x86 Emulator 2.3.5
                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
# In bx_win32_gui_c::exit(void)!
=====
Bochs is exiting with the following message:
[VGUI ] POWER button turned off.
=====

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

C:\OS\LAB\LAB1>s

Bochs for Windows - Display
=====
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...
Starting BootCD.....

Microsoft(R) MS-DOS 7.1
(C)Copyright Microsoft Corp 1981-1999.

A:\>_

CTRL + 3rd button enables mouse  A: NUM CAPS SCRL
```