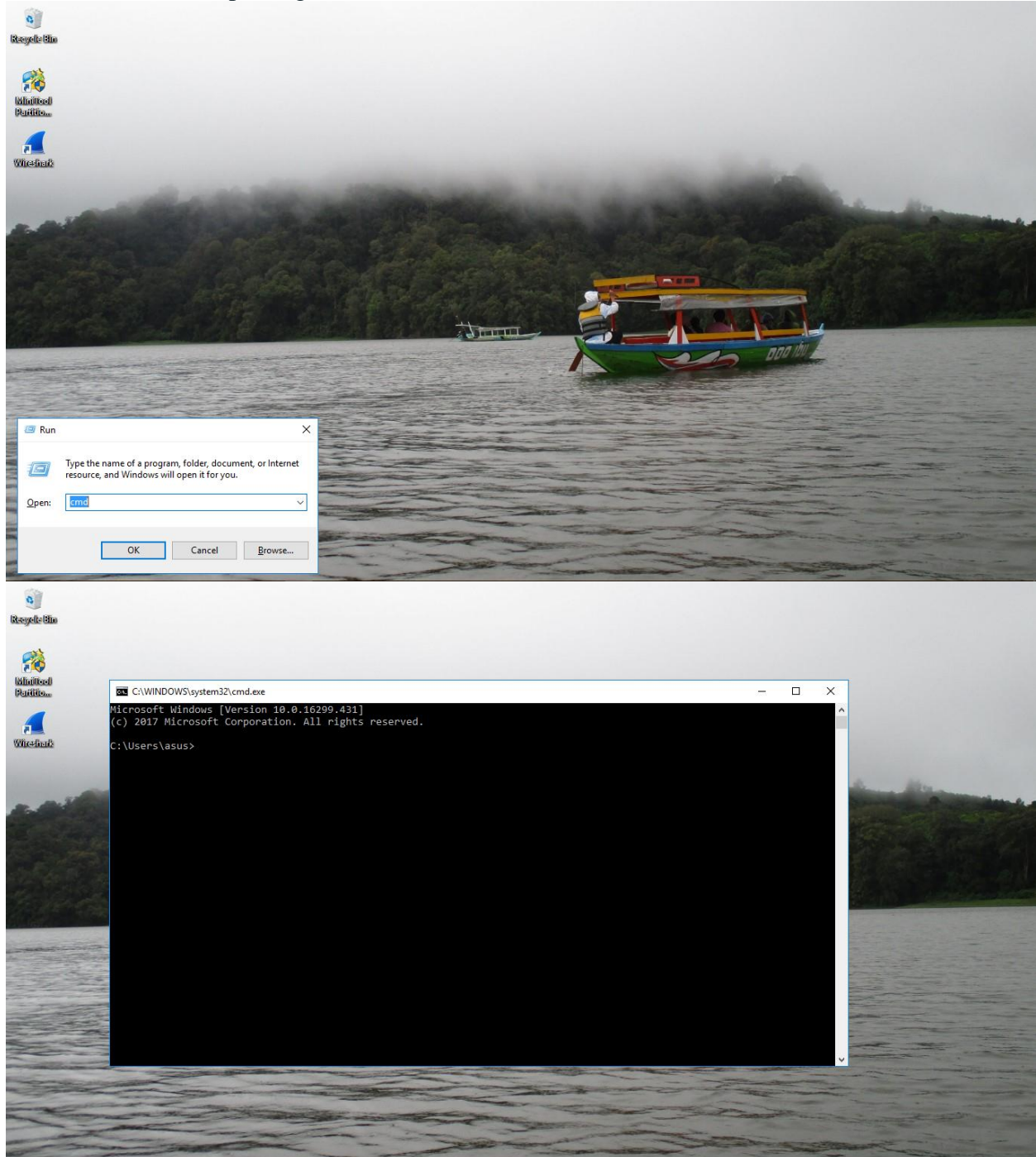


Nama : Muhammad Vicky Al Hasri  
NIM : L200170065

## Modul 2

### Pengenalan Proses Pembuatan “DISK BOOT”

Buka Commad Prompt dengan cara Windows+R, lalu masuk ke CMD



## Menuju ke direktori kerja

\*Masuk ke direktori kerja C:\OS

\*Melihat isi direktori di dalam folder OS dengan perintah dir pada command prompt

\*Menjalankan file setpath untuk mengatur lingkungan kerja

\*ketik “cd LAB/LAB2” dilanjutkan perintah “dir” untuk melihat file didalamnya

```
C:\WINDOWS\system32\cmd.exe
Volume in drive C is OS
Volume Serial Number is 8882-EB3E

Directory of C:\OS

20/09/2018  20:31    <DIR>          .
20/09/2018  20:31    <DIR>          ..
20/09/2018  20:26    <DIR>          Bochs-2.3.5
12/09/2016  05:33             0  bimage
20/09/2018  20:26    <DIR>          Dev-Cpp
17/12/2008  07:08             1,096,291  i386.pdf
20/09/2018  20:26    <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)            127,148,564,480 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\LAB2

C:\OS\LAB\LAB2>dir
Volume in drive C is OS
Volume Serial Number is 8882-EB3E

Directory of C:\OS\LAB\LAB2

27/09/2018  06:04    <DIR>          .
27/09/2018  06:04    <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
27/02/2007  03:50             342,016  dd.exe
15/12/2008  20:52             78  dosfp.bat
08/09/2016  13:37             1,474,560  floppy.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
             11 File(s)                1,853,682 bytes
             2 Dir(s)            127,148,494,848 bytes free

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

## Melihat isi direktori kerja

\*Menyiapkan file image “floppy.img”

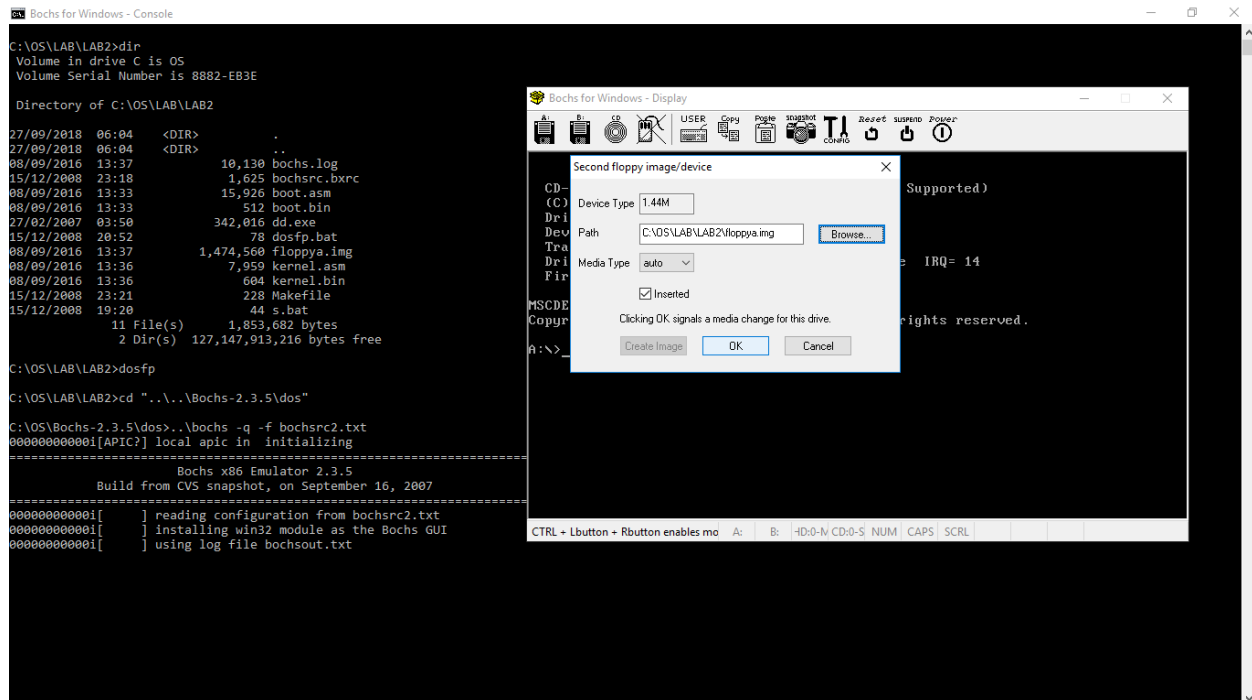
```
C:\WINDOWS\system32\cmd.exe
C:\OS\LAB\LAB2>dir
Volume in drive C is OS
Volume Serial Number is 8882-EB3E

Directory of C:\OS\LAB\LAB2

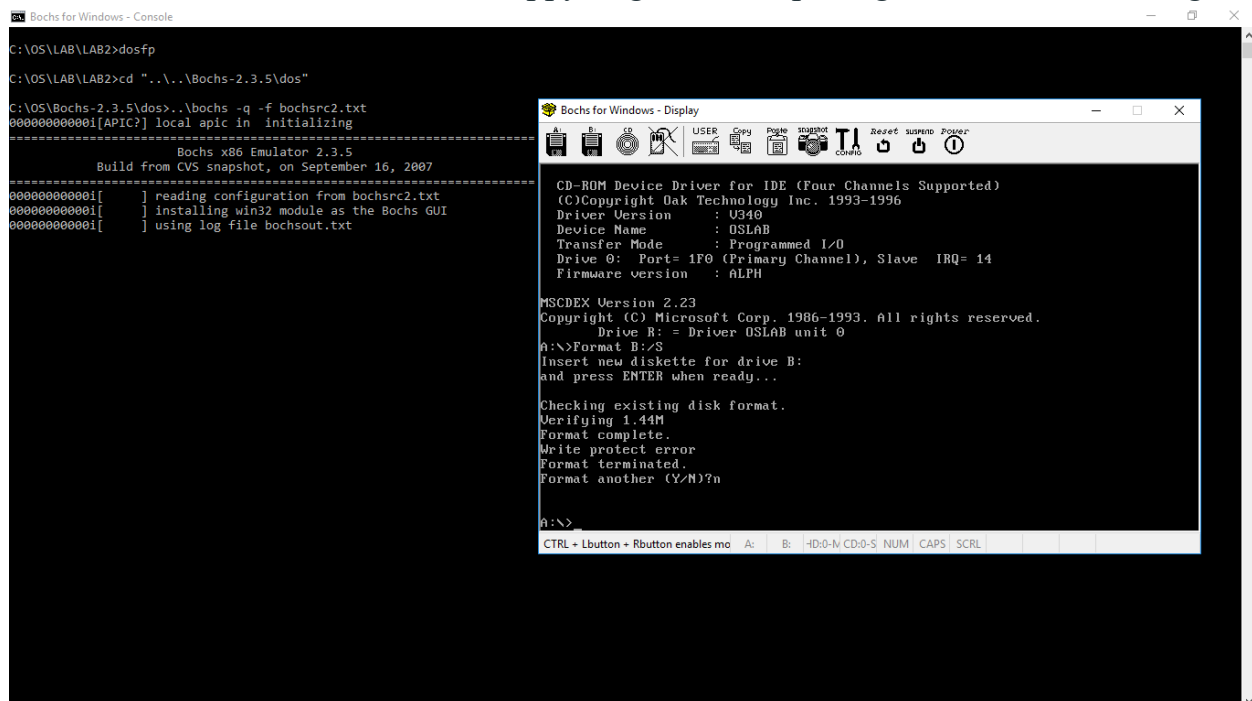
27/09/2018  06:04    <DIR>          .
27/09/2018  06:04    <DIR>          ..
08/09/2016  13:37             10,130  bochs.log
15/12/2008  23:18             1,625  bochsrc.bxrc
08/09/2016  13:33             15,926  boot.asm
08/09/2016  13:33             512  boot.bin
27/02/2007  03:50             342,016  dd.exe
15/12/2008  20:52             78  dosfp.bat
08/09/2016  13:37             1,474,560  floppy.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
             11 File(s)                1,853,682 bytes
             2 Dir(s)            127,147,913,216 bytes free

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

- \*Memformat file “floppya.img” dan mengisi dengan system Operasi DOS versi 7
- \*Jalankan perintah “dosfp”
- \*Pada Bochs klik menu gambar floppy disk nomor dua dari kanan atau B
- \*Atur lokasi file image sehingga menunjukkan file “floppya.img” pada LAB2 dengan klik “Browser” dan atur lalu “Ok”



- \*Pada prompt “A:>” ketik dengan “A:>Format B:/S”
- \*Jika tidak ada kesalahan maka “floppya.img” maka dapat digunakan untuk booting.



\*Tutup Windows “Bochs” klik menu “Power” . Pada windows “Command Prompt” akan tampak bekas aktifitas “Bochs” seperti dibawah ini.

```
C:\WINDOWS\system32\cmd.exe

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
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\lab2"

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

\*BOOT PC-Simulator dengan file “floppy.img”

\*Pindah direktori kerja pada windows “Command Prompt” dan jalankan perintah “s” lalu “Enter”

```
Bochs for Windows - Console

                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\lab2"

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
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\lab2"

C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\..\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 bochs.log
=====
```

```
Bochs for Windows - Display

F1exB6/Bochs UGABios 0.6a 19 Aug 2006
This UGA/UBE Bios is released under the GNU LGPL.

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

Bochs UBE 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$>_

CTRL + Lbutton + Rbutton enables mo  A: NUM CAPS SCRL
```

- \*Kompilasi source code “boot.asm” dan memindah hasil ke bootsector “floopya.img”. Pindah ke direktori kerja “LAB2”
- \*Jalankan perintah “make fp.disk”

```
C:\WINDOWS\system32\cmd.exe

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

C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floopya.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

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

- \*Jalankan PC-Simulator ketik “s” lalu “Enter” maka akan tampil seperti ini

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

C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floopya.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

C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\..\bochs-2.3.5\bochs -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

Bochs for Windows - Display

Plex86/Bochs UGABios 0.6a 19 Aug 2006
This UGA/UBE Bios is released under the GNU LGPL

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

Bochs UBE Display Adapter enabled

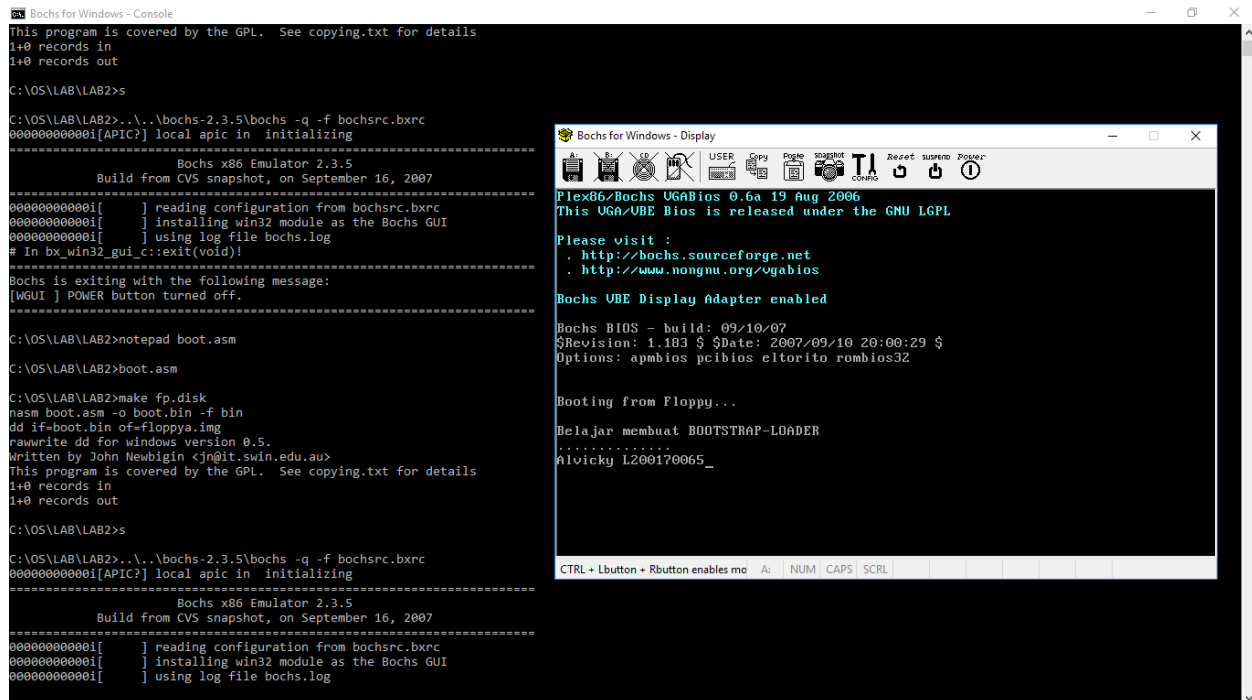
Bochs BIOS - build: 09/10/07
$Revision: 1.183 $ $Date: 2007/09/10 20:00:29 $
Options: apmbios pcibios eltorito rombios32

Booting from Floppy...

Loading Kernel ver 0.01
.....
ERROR : Press Any Key to Reboot_

CTRL + Lbutton + Rbutton enables mo  A: NUM CAPS SCRL
```

- \*Menyunting file “boot.asm” ketika “notepad boot.asm” lalu “Enter”, cari teks Loading Kernel” pada windows “Notepad”
- \*Sunting baris “Loading kernel ver 0.01” menjadi dengan “Belajar membuat BOOTSTRAP\_LOADER”
- \*Sunting juga baris “ERROR: Press Any Key to Reboot” dengan cara yang sama dengan nama “Alvicky L200170065”
- \*Simpan file “boot.asm” dengan CTRL+S
- \*Ulangi kompilasi file “boot.asm” dan jalankan perintah “Make fp.disk” lalu “Enter”
- \* Jalankan PC-Simulator ketika “s” lalu “Enter” maka akan tampil seperti ini



```
Bochs for Windows - Console
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
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
# In bx_win32_gui_c::exit(void)!
=====
Bochs is exiting with the following message:
[VGUI ] POWER button turned off.
=====

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

C:\OS\LAB\LAB2>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
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
=====

Bochs for Windows - Display
Flex86/Bochs UGABios 0.6a 19 Aug 2006
This UGA/UE Bios is released under the GNU LGPL

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

Bochs UBE 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
.....
Alvicky L200170065_

CTRL + Lbutton + Rbutton enables mo  A:  NUM  CAPS  SCRL
```

- \*Menyiapkan file “kernel.bin” Prototype source code program kernel disimpan pada file “kernel.asm” lalu periksa pada direktori kerja anda.
- \*Lakukan proses kompilasi untuk menghasilkan file “kernel.bin”
- \*Lalu jalankan perintah “make kernel”
- \*Apabila tidak ada kesalahan, berarti proses kompilasi berhasil pada direktori kerja dan terdapat file baru yaitu “kernel.bin”
- \*Ketik perintah “dir” untuk melihat isi file didalamnya

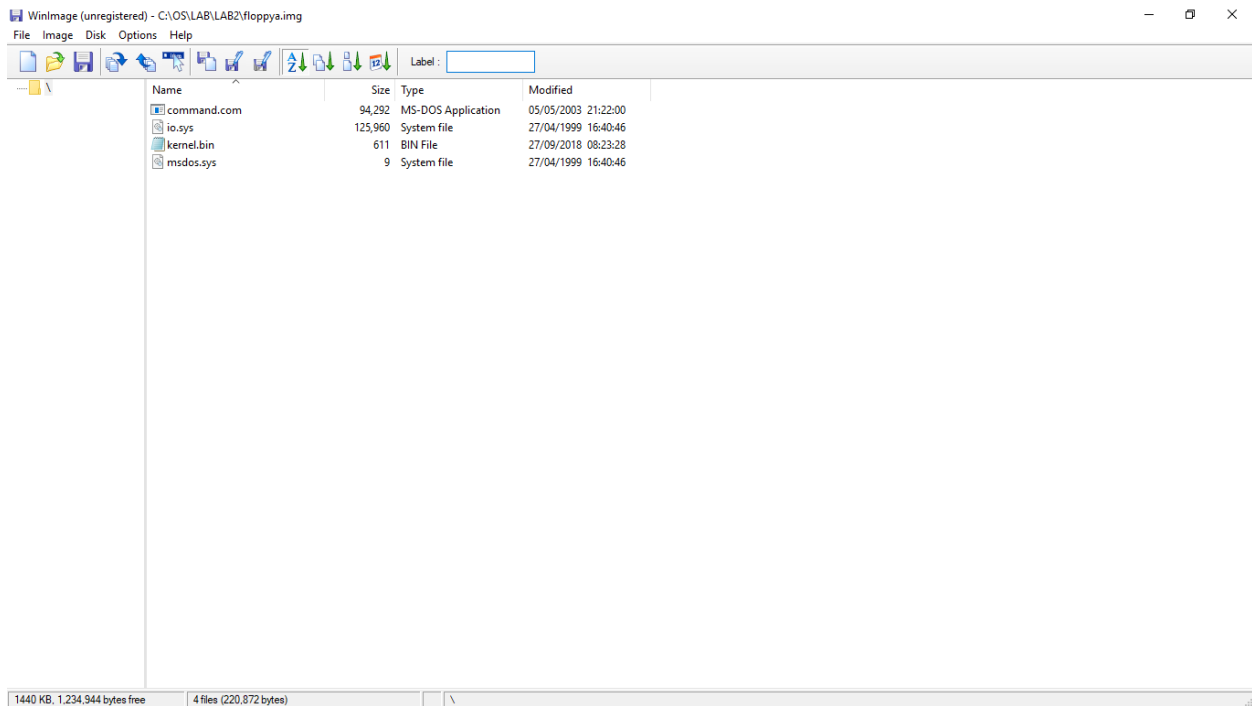
```
C:\WINDOWS\system32\cmd.exe
C:\OS\LAB\LAB2>kernel.asm
C:\OS\LAB\LAB2>make kernel
nasm kernel.asm -o kernel.bin -f bin
C:\OS\LAB\LAB2>dir
Volume in drive C is OS
Volume Serial Number is 8882-EB3E

Directory of C:\OS\LAB\LAB2

27/09/2018  08:23    <DIR>          .
27/09/2018  08:23    <DIR>          ..
27/09/2018  08:21         10,153 bochs.log
15/12/2008  23:18         1,625 bochsrc.bxrc
27/09/2018  08:15         15,918 boot.asm
27/09/2018  08:16           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
27/09/2018  08:16       1,474,560 floppy.img
19/09/2018  12:09         7,966 kernel.asm
27/09/2018  08:23          611 kernel.bin
15/12/2008  23:21          228 Makefile
15/12/2008  19:20           44 s.bat
               12 File(s)      1,872,143 bytes
               2 Dir(s)  127,527,825,408 bytes free

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

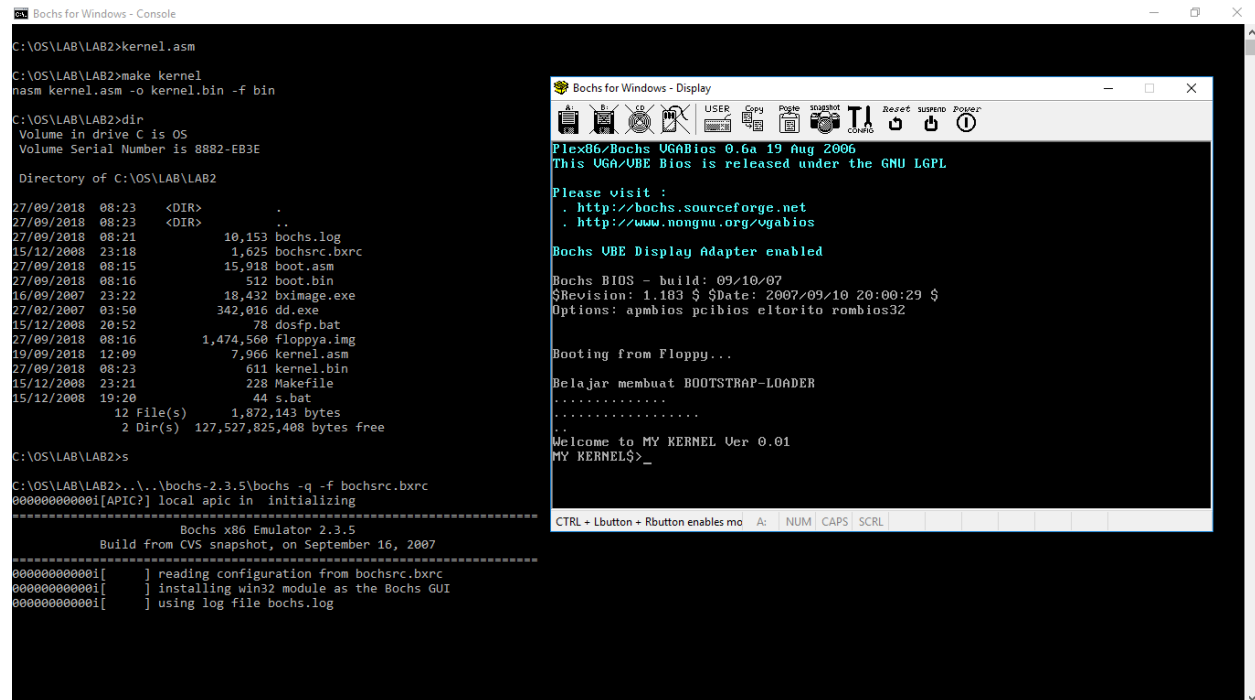
- \*Memindahkan file “kernel.bin” ke dalam file image “floppy.img”
- \*Untuk melakukan ini dengan menggunakan program shareware namanya “winimage”
- \*Buka direktori kerja “C:\OS\LAB\LAB2” dengan Windows Explore
- \*Klik double pada file “floppy.img” atau panggil program winimage klik “Start | All Programs| Winimage| Winimage
- \*Kemudian klik open dan cari file “floppy.img” pada direktori kerja untuk memasukkan file “kernel.bin” pada Windows “Winimage” klik menu “image| inject”
- \*Lalu cari file “kernel.bin” pada direktori kerja dan OK. Lalu simpan dengan “File| Save” dan keluar dari Winimage





\*Kembali ke Windows “Command Prompt”direktori kerja

\* Jalankan PC-Simulator ketik “s” lalu “Enter” maka akan tampil seperti ini



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

C:\OS\LAB\LAB2>dir
Volume in drive C is OS
Volume Serial Number is 8882-EB3E

Directory of C:\OS\LAB\LAB2

27/09/2018  08:23    <DIR>          .
27/09/2018  08:23    <DIR>          ..
27/09/2018  08:21         10,153 bochs.log
15/12/2008  23:18         1,625 bochssrc.bxrc
27/09/2018  08:15         15,918 boot.asm
27/09/2018  08:16           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
27/09/2018  08:16    1,474,560 floppy.aimg
19/09/2018  12:09         7,966 kernel.asm
27/09/2018  08:23          611 kernel.bin
15/12/2008  23:21         228 Makefile
15/12/2008  19:20           44 s.bat
                12 File(s)      1,872,143 bytes
                2 Dir(s)      127,527,825,408 bytes free

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

Bochs UBE Display Adapter enabled
Bochs BIOS - build: 09/10/07
$Revision: 1.103 $ $Date: 2007/09/10 20:00:29 $
Options: apmbios pcibios eltorito rombios32

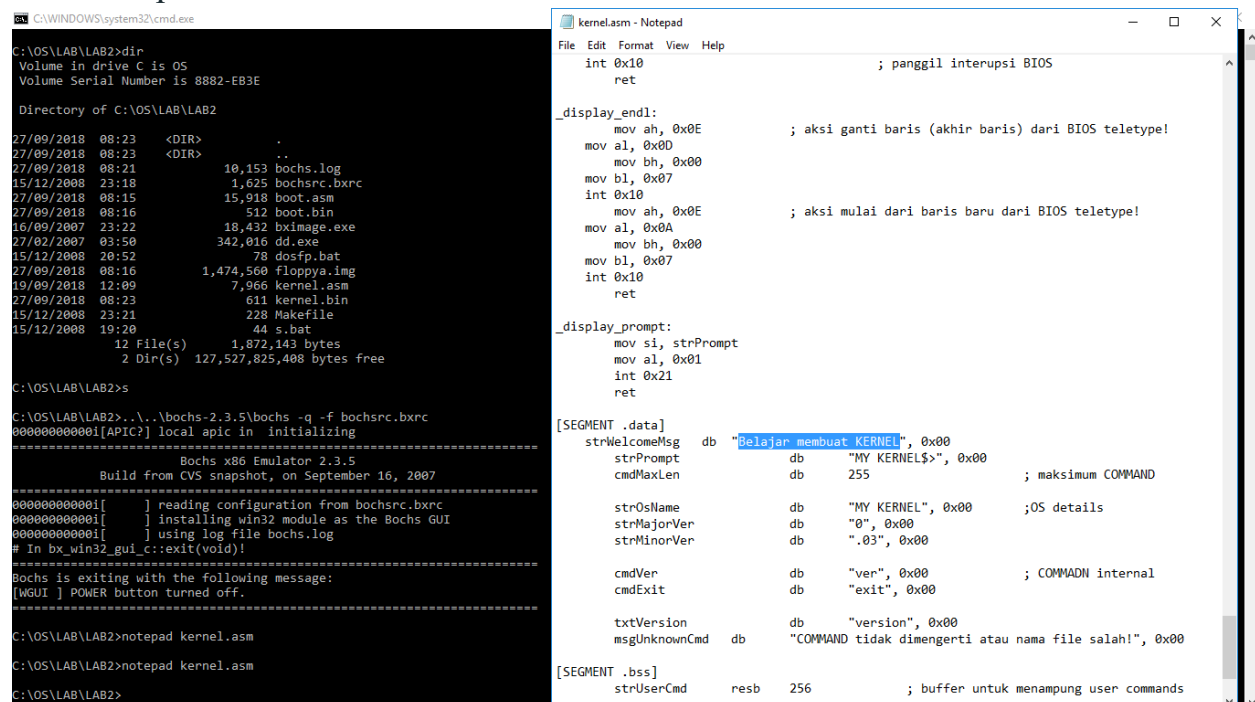
Booting from Floppy...

Belajar membuat BOOTSTRAP-LOADER
.....
..
Welcome to MY KERNEL Ver 0.01
MY KERNEL>
```

\*Memodifikasi file “kernel.asm”

\*Jalankan perintah “Notepad kernel.asm” lalu “Enter”. Cari teks “Welcome to MY KERNEL. . . .” ganti dengan teks “Belajar membuat KERNEL”

\*Lalu simpan file “kernel.asm” tekan CTRL+S



```
C:\WINDOWS\system32\cmd.exe
C:\OS\LAB\LAB2>dir
Volume in drive C is OS
Volume Serial Number is 8882-EB3E

Directory of C:\OS\LAB\LAB2

27/09/2018  08:23    <DIR>          .
27/09/2018  08:23    <DIR>          ..
27/09/2018  08:21         10,153 bochs.log
15/12/2008  23:18         1,625 bochssrc.bxrc
27/09/2018  08:15         15,918 boot.asm
27/09/2018  08:16           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
27/09/2018  08:16    1,474,560 floppy.aimg
19/09/2018  12:09         7,966 kernel.asm
27/09/2018  08:23          611 kernel.bin
15/12/2008  23:21         228 Makefile
15/12/2008  19:20           44 s.bat
                12 File(s)      1,872,143 bytes
                2 Dir(s)      127,527,825,408 bytes free

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:
[VGUI] POWER button turned off.
-----

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

```
kernel.asm - Notepad
File Edit Format View Help

int 0x10                                ; panggil interupsi BIOS
ret

_display_endl:
    mov ah, 0x0E                        ; aksi ganti baris (akhir baris) dari BIOS teletype!
    mov al, 0x00
    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
    msgUnknownCmd  db "COMMAND tidak dimengerti atau nama file salah!", 0x00

[SEGMENT .bss]
    strUserCmd     resb 256              ; buffer untuk menampung user commands
```

- \*Ulangi proses kompilasi dengan perintah “make kernel” lalu “Enter”
- \*Lalu lakukan proses memindahkan file “kernel.bin” kedalam file “kernel.bin”  
kedalam file “floppya.img” dengan Winimage
- \*Jalankan PC-Simulator ketik “s” lalu “Enter” maka akan tampil seperti ini

