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MODUL 2

Go to work directory. Enter C:\OS 'work directory. View directory contents in OS folder with dir command at command prompt. Run setpath file to set work environment. type "cd LAB/ LAB2" followed by "dir" command to view the file inside and Prepare the image file "floppya.img"

```
Command Prompt
Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Convy_22nd>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

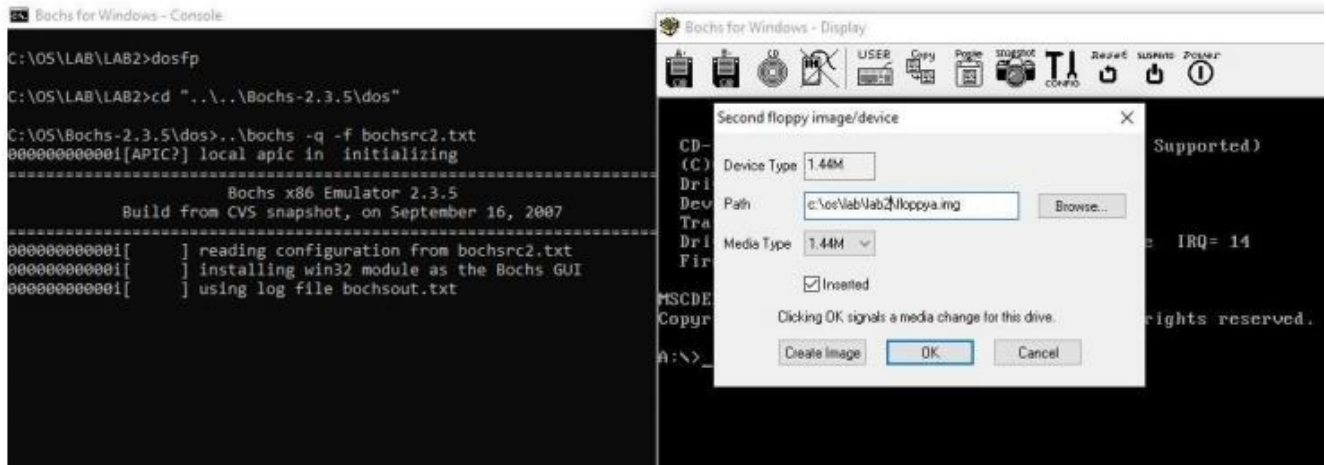
C:\OS\LAB\LAB2>dir
Volume in drive C has no label.
Volume Serial Number is BEBE-CC95

Directory of C:\OS\LAB\LAB2

25/09/2019  09:07    <DIR>          .
25/09/2019  09:07    <DIR>          ..
25/09/2019  17:39             10,155 bochs.log
15/12/2008  17:18             1,625 bochsrc.bxrc
15/12/2008  18:57             15,923 boot.asm
25/09/2019  09:07              512 boot.bin
15/12/2008  14:52              78 dosfp.bat
25/09/2019  09:07         1,474,560 floppya.img
15/12/2008  18:57             7,966 kernel.asm
15/12/2008  17:21              228 Makefile
15/12/2008  13:20              44 s.bat
               9 File(s)         1,511,091 bytes
               2 Dir(s)  25,539,268,608 bytes free

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

Format the file "floppya.img" and fill it with the DOS Operating system version 7. Run the "dosfp" command. In Bochs click on the second image floppy disk menu from the right or B. Set the location of the image file so that it shows the file "floppya.img" on LAB2 by clicking "Browser" and setting it to then "OK".



At the "A:>" prompt type "A:> Format B: / S". If there are no errors, "floppy.img" can be used to boot.



Close Windows "Bochs" click on the "Power" menu. In the "Command Prompt" window will appear former "Bochs" activities as below.

Command Prompt

```
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:
[WGUI ] POWER button turned off.
=====

C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab2"

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

PC-Simulator BOOT with file "floppy.img". Change the working directory on the Windows "Command Prompt" and run the command "s" then "Enter"

```
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:
[WGUI ] POWER button turned off.
=====

C:\OS\Bochs-2.3.5\dos>cd "C:\os\lab\lab2"

C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
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

Plex86/Bochs VGABios 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...
 Starting BootCD.....

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

A:\>_

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

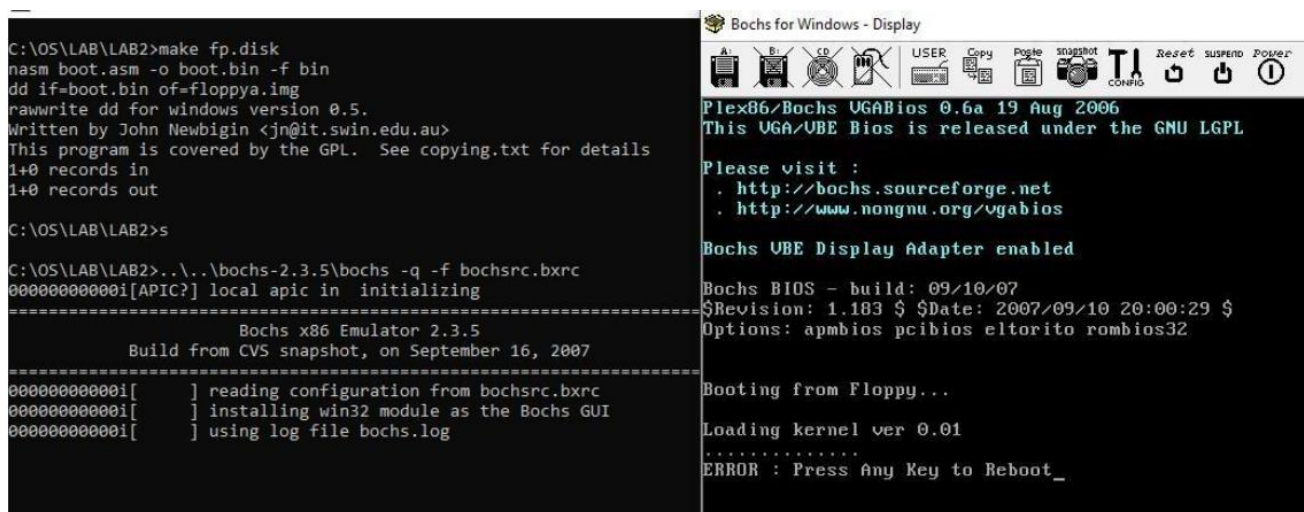
Activate Windows

Compile the "boot.asm" source code and move the results to the "floppya.img" bootsector. Move to "LAB2" working directory. Run the "make fp.disk" command

```
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>
```

Run PC-Simulator type "s" then "Enter" then it will appear like this.



Edit the file "boot.asm" type "notepad boot.asm" then "Enter", look for the text Loading Kernel "

Windows "Notepad"

Edit the line "Loading kernel ver 0.01" to with "Learn to make BOOTSTRAP_LOADER"

Also edit the line "ERROR: Press Any Key to Reboot" in the same way as the name "Rohmad

L2001180101 "

Save the "boot.asm" file with CTRL + S


```

boot.asm - Notepad
File Edit Format View Help
;=====
;      ImageName  db "KERNEL BIN"
;=====
;
; Teks yang akan ditampilkan saat mulai proses
; BOOT : Loading kernel ver 0.01
; Di awali dan diakhiri dengan tanda :
; -- 0x0D akhir baris
; -- 0x0A baris baru
; -- 0x00 Karakter 'NULL' pembatas dengan data di bawahnya
;=====
;      msgLoading db 0x0D, 0x0A, "Bootsrap Loader ", 0x0D, 0x0A, 0x00
;      msgCRLF   db 0x0D, 0x0A, 0x00
;      msgProgress db ".", 0x00
;=====
;
; Teks yang di tampilkan saat terjadi kesalahan BOOT
;=====
;      msgFailure db 0x0D, 0x0A, "Rohmad Khoirudin : L200180101 author by: c
;=====
; (4) BLOK BOOT SIGNATURE
;=====

```

Repeat the compilation of the file "boot.asm" and run the command "Make fp.disk" then "Enter".

Run PC-Simulator type "s" then "Enter" then it will appear like this.

```

C:\OS\LAB\LAB2>notepad boot.asm
C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floppya.img
rawwrite dd for windows version 0.5.
Written by John Newbigin <jn@it.swin.edu.au>
This program is covered by the GPL. See copying.txt for details
140 records in
140 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
Plex86/Bochs VGABios 0.6a 19 Aug 2006
This VGA/VE 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...
Bootsrap Loader
.....
Rohmad Khoirudin : L200180101 author by: convy_22nd_

```

Prepare file "kernel.bin" Prototype kernel source code is stored in the file "kernel.asm"

then check your work directory.

Perform the compilation process to produce the file "kernel.bin"

Then run the "make kernel" command

If there are no errors, the compilation is successful in the working directory and there are files new is "kernel.bin"

Type the command "dir" to see the contents of the file inside

```

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

C:\OS\LAB\LAB2>dir
Volume in drive C has no label.
Volume Serial Number is BE8E-CC95

Directory of C:\OS\LAB\LAB2

25/09/2019  18:01    <DIR>        .
25/09/2019  18:01    <DIR>        ..
25/09/2019  18:01             10,153 bochs.log
15/12/2008  17:18             1,625 bochsrc.bxrc
25/09/2019  17:59             15,935 boot.asm
25/09/2019  17:59              512 boot.bin
15/12/2008  14:52              78 dosfp.bat
25/09/2019  17:59          1,474,560 floppy.img
15/12/2008  18:57             7,966 kernel.asm
25/09/2019  18:01              611 kernel.bin
15/12/2008  17:21              228 Makefile
15/12/2008  13:20              44 s.bat
               10 File(s)      1,511,712 bytes
               2 Dir(s)  25,539,022,848 bytes free

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

Move the file "kernel.bin" into the "floppy.img" image file

To do this using a shareware program called "winimage"

Open the working directory "C: \ OS \ LAB \ LAB2" with Windows Explore

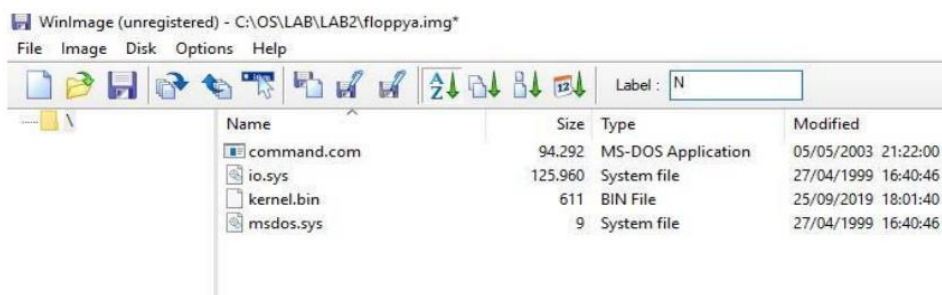
Double click on the file "floppy.img" or call the Winimage program click "Start | All

Programs | Winimage | Winimage

Then click open and look for the file "floppy.img" in the working directory to enter the file

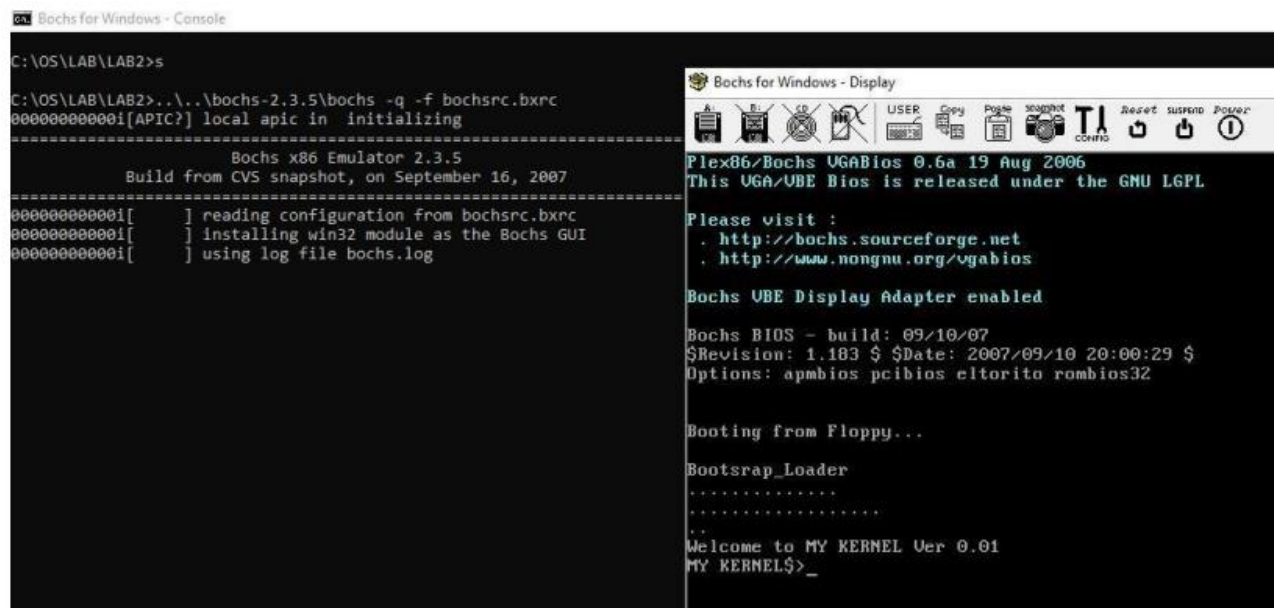
"Kernel.bin" in Windows "Winimage" click on the "image | menu inject "

Then look for the file "kernel.bin" in the working directory and OK. Then save with "File | Save "and exit from Winimage



Return to the Windows "Command Prompt" working directory

Run PC-Simulator type "s" then "Enter" then it will appear like this



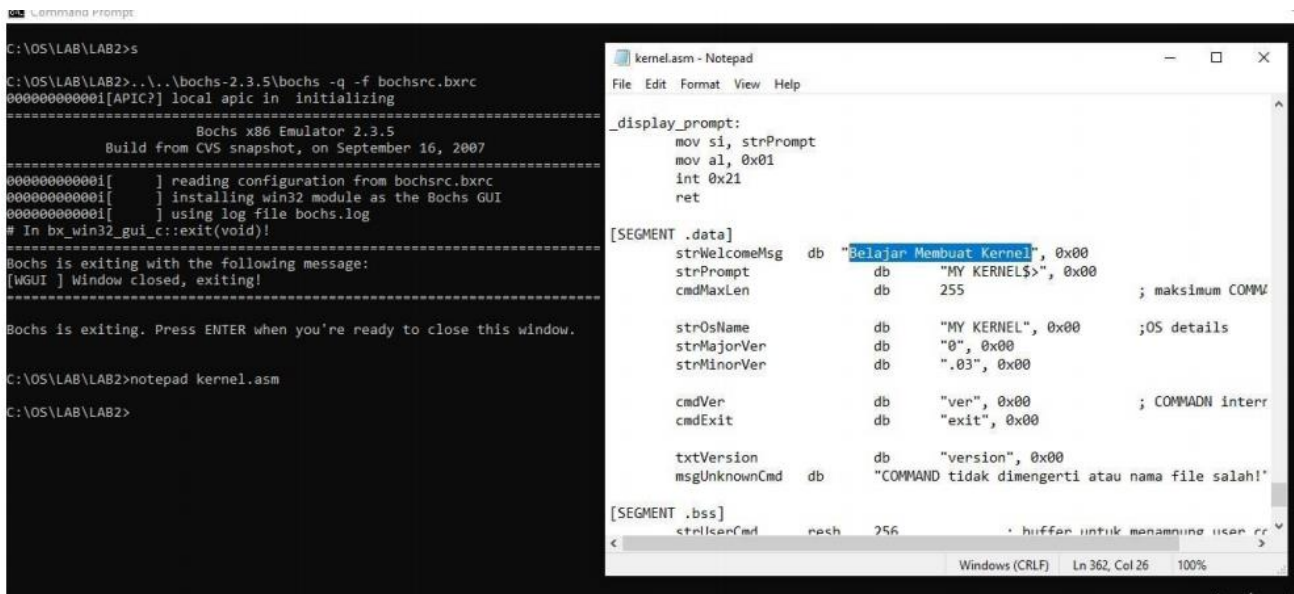
The screenshot shows two windows from the Bochs emulator. The 'Bochs for Windows - Console' window displays the command prompt output for running 'bochs -q -f bochsrc.bxrc'. It shows the Bochs x86 Emulator 2.3.5 build from a CVS snapshot on September 16, 2007. It also shows the initialization of the local APIC and the loading of the win32 module. The 'Bochs for Windows - Display' window shows the UGA BIOS 0.6a 19 Aug 2006, which is released under the GNU LGPL. It displays the Bochs UBE Display Adapter enabled, the Bochs BIOS build date (09/10/07), and the revision (1.183). It also shows the booting from floppy and the bootstrap loader, leading to the 'Welcome to MY KERNEL Ver 0.01' message.

Modifying the "kernel.asm" file

Run the command "Notepad kernel.asm" then "Enter". Look for the text "Welcome to MY KERNEL ..." instead

with the text "Learn to make KERNEL"

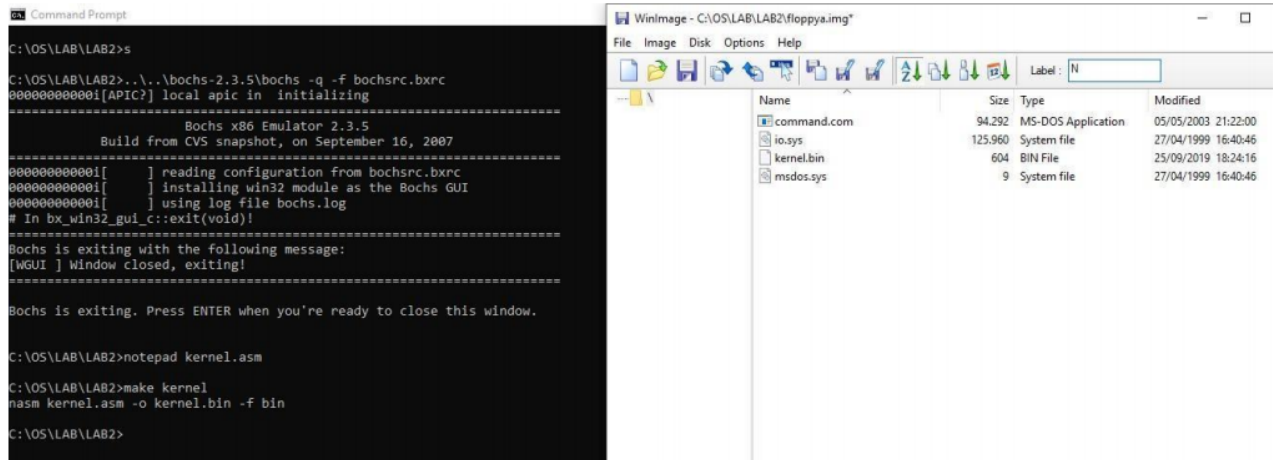
Then save the file "kernel.asm" press CTRL + S



The screenshot shows two windows. The 'Command Prompt' window displays the command prompt output for running 'bochs -q -f bochsrc.bxrc'. It shows the Bochs x86 Emulator 2.3.5 build from a CVS snapshot on September 16, 2007. It also shows the initialization of the local APIC and the loading of the win32 module. The 'Notepad' window shows the 'kernel.asm' file. The file contains assembly code for the display prompt, including the 'strWelcomeMsg' string, which is currently set to 'Belajar Membuat Kernel'. The file also contains the 'strPrompt' string, which is set to 'MY KERNEL\$>'. The file is saved as 'kernel.asm'.

Repeat the compilation process with the command "make kernel" then "Enter"

Then do the process of moving the file "kernel.bin" into the file "kernel.bin" into the file "Floppya.img" with Winimage



Run PC-Simulator type "s" then "Enter" then it will appear like this

