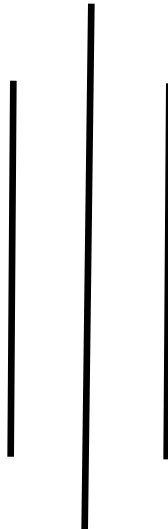




LAPORAN PRAKTIKUM SISTEM OPERASI
MODUL 2 : MENGENAL PROSES
PEMBUATAN 'DISK BOOT'



DISUSUN OLEH :

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KELAS : C

PROGRAM STUDI TEKNIK INFORMATIKA
FAKULTAS KOMUNIKASI DAN INFORMATIKA
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TAHUN 2022/2023

Berikut adalah screenshot dari percobaan yang telah saya lakukan :

1. Menuju direktori kerja OS melalui Command Prompt, selanjutnya 'setpath', lalu masuk ke direktori LAB2 serta melakukan pengecekan.

```
Command Prompt - bxImage
Volume in drive C is Windows
Volume Serial Number is 76CF-0F5A

Directory of C:\OS\LAB\LAB2

23/09/2022  16:09  <DIR>          .
23/09/2022  16:09  <DIR>          ..
11/10/2019  14:42                10.184 bochsout.txt
15/12/2008  16:17                1.628 bochsrc.bxrc
25/09/2019  16:29                14.359 boot.asm
25/09/2019  16:31                 512 boot.bin
16/09/2015  07:51                 512 boots.bin
15/12/2008  00:47                 78 dosfp.bat
25/09/2019  16:42            1.474.560 floppy.img
25/09/2019  16:41                7.971 kernel.asm
25/09/2019  16:41                 616 kernel.bin
15/12/2008  16:21                 227 Makefile
15/12/2008  12:20                 44 s.bat
               11 File(s)          1.510.691 bytes
               2 Dir(s)  126.709.923.840 bytes free
```

2. Menyiapkan file 'floppy.img' menggunakan perintah 'bximage'. Membuat floppy image dengan perintah 'fd', mengatur kapasitas menjadi 1,44MB, dan memberikan nama 'floppy.img'. kemudian masukkan perintah 'dir'.

```
Command Prompt
Volume Serial Number is 76CF-0F5A

Directory of C:\OS\LAB\LAB2

23/09/2022  16:09  <DIR>          .
23/09/2022  16:09  <DIR>          ..
11/10/2019  14:42                10.184 bochsout.txt
15/12/2008  16:17                1.628 bochsrc.bxrc
25/09/2019  16:29                14.359 boot.asm
25/09/2019  16:31                 512 boot.bin
16/09/2015  07:51                 512 boots.bin
15/12/2008  00:47                 78 dosfp.bat
25/09/2019  16:42            1.474.560 floppy.img
25/09/2019  16:41                7.971 kernel.asm
25/09/2019  16:41                 616 kernel.bin
15/12/2008  16:21                 227 Makefile
15/12/2008  12:20                 44 s.bat
               11 File(s)          1.510.691 bytes
               2 Dir(s)  126.709.923.840 bytes free

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] 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]

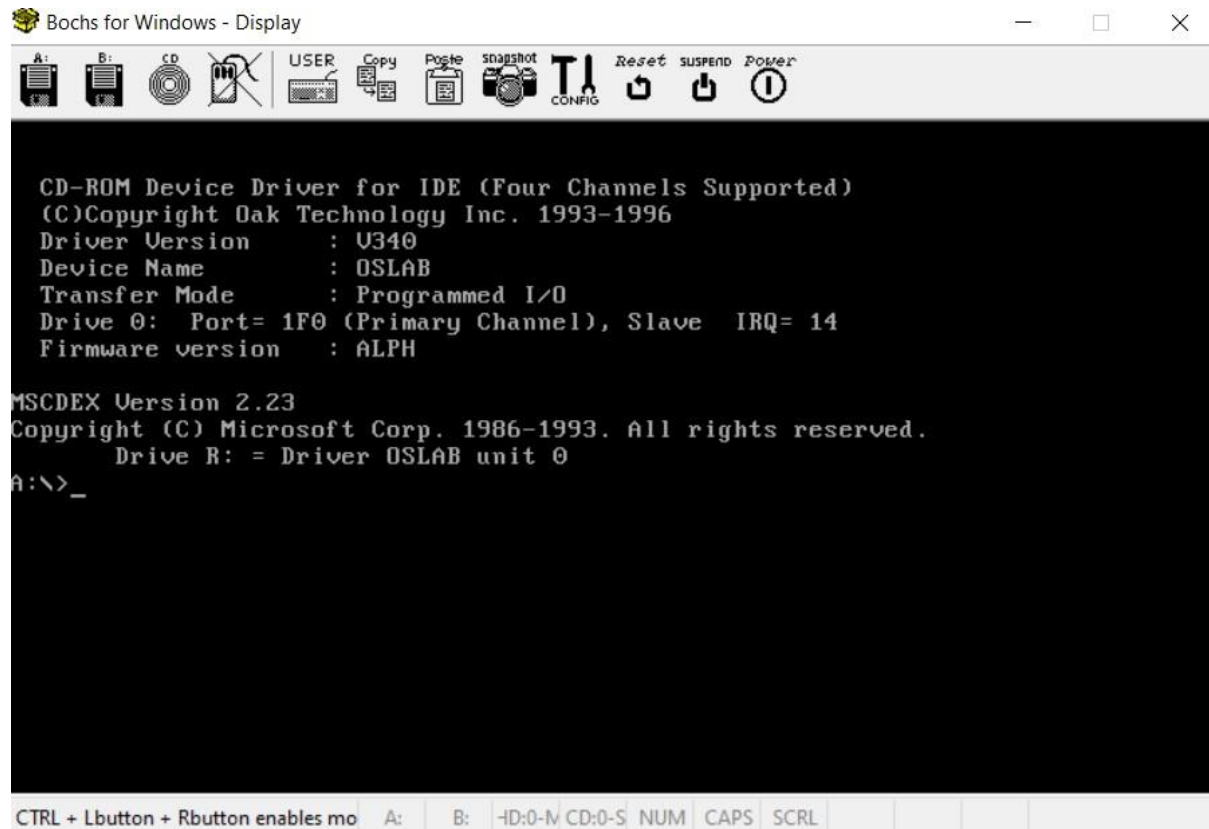
I will create a floppy image with
cyl=80
heads=2
sectors per track=18
total sectors=2880
total bytes=1474560

What should I name the image?
[a.img] floppy.img

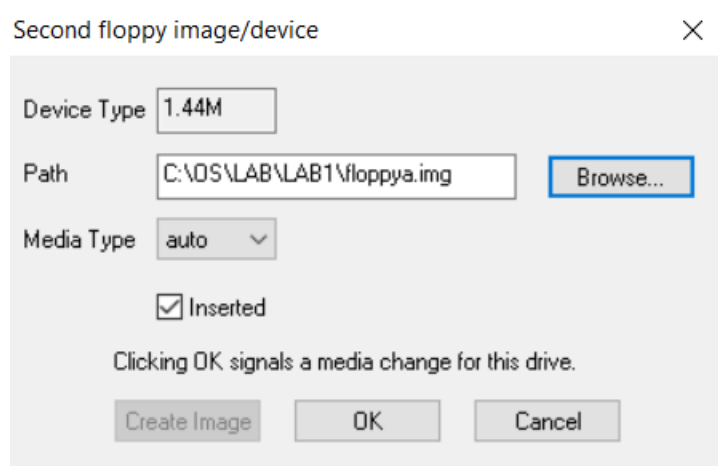
The disk image 'floppy.img' already exists. Are you sure you want to replace it?
Please type yes or no. [no]
ERROR: Aborted

Press any key to continue
```

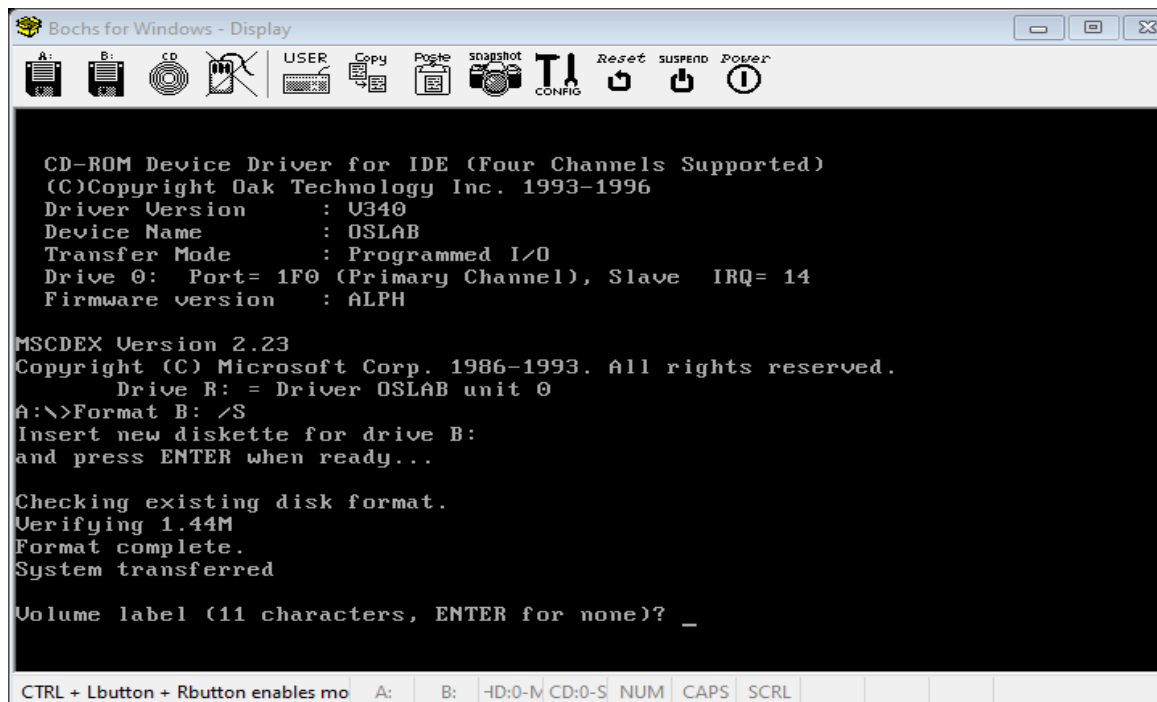
3. Mem-format 'floppya.img' dan mengisinya dengan system operasi DOS versi 7. Jalankan perintah 'dosfp'



4. Mengatur lokasi file image sehingga menunjuk ke file 'floppya.img'.

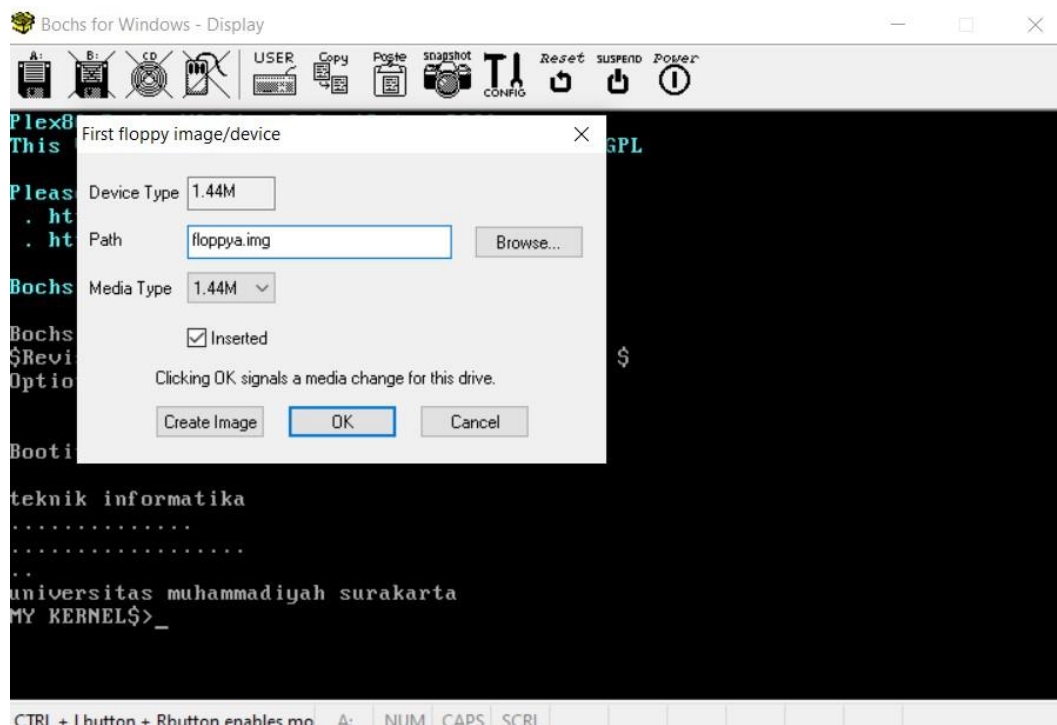
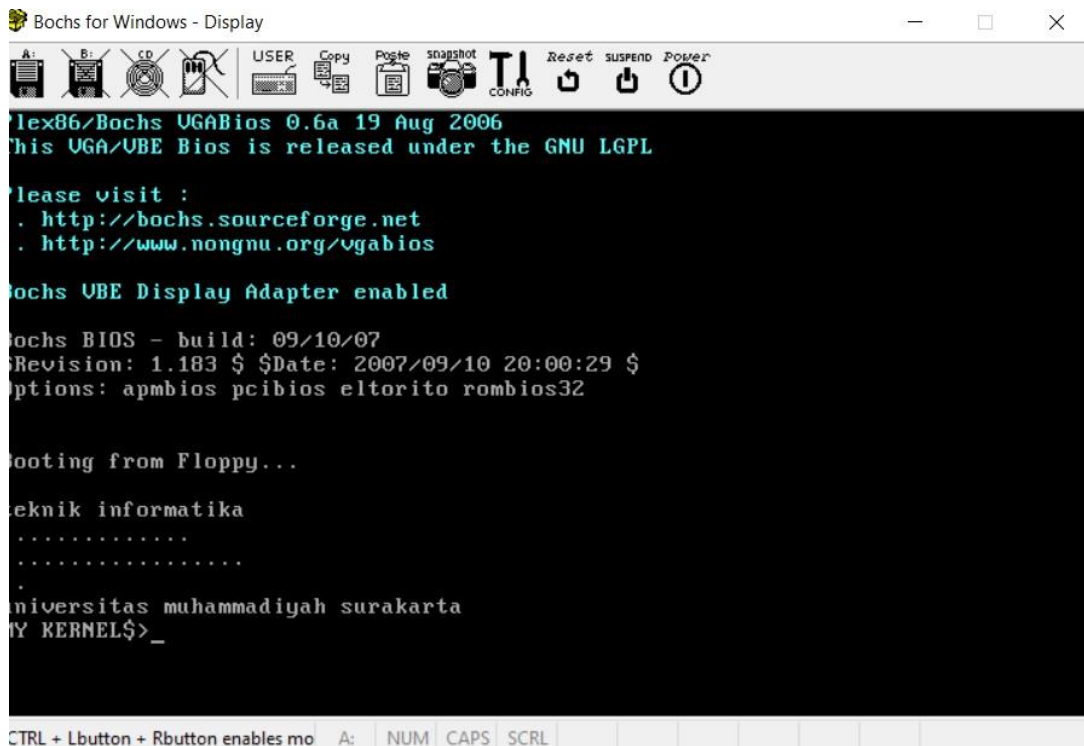


5. Melakukan proses booting menggunakan 'Bochs' dengan perintah 'A:>Format B: /S' dan dilanjutkna dengan 'dosFp'



```
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
0000000000i[APIC?] local apic in initializing
=====
                Bochs x86 Emulator 2.3.5
                Build from CVS snapshot, on September 16, 2007
=====
0000000000i[      ] reading configuration from bochsrc2.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\lab1"
```

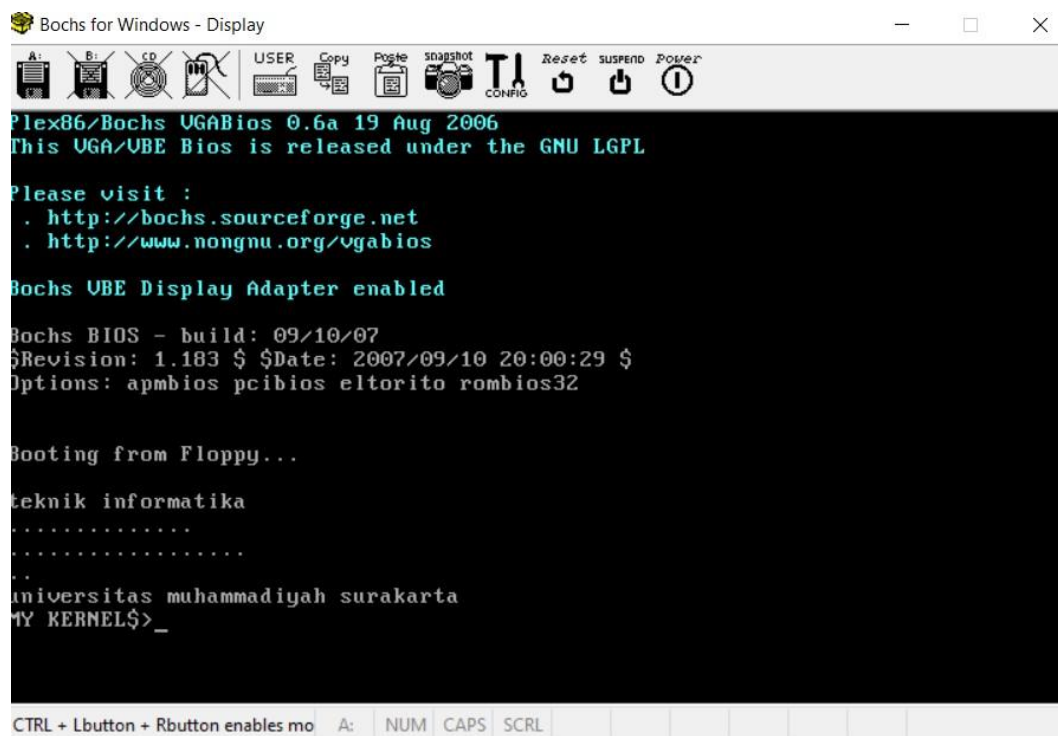
6. BOOT PC-simulator dengan file 'floppya.img'. Pindah ke direktori kerja pada window 'Command Prompt' dan jalankan perintah 's' <ENTER>



7. Kompilasi source code 'boot.asm' dan memindah hasilnya ke bootsector 'floppya.img'. Pindah ke direktori kerja 'LAB2' ketikan perintah 'cls' untuk membersihkan layer. Selanjutnya menjalankan perintah 'make fp.disk'.

```
Command Prompt
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>
```

8. BOOT PC Simulator dengan program bootstraploader yang baru. Menjalankan PC Simulator dengan mengetikkan perintah 's' <ENTER>



The screenshot shows the Bochs for Windows - Display window. The title bar includes standard window controls and a toolbar with icons for A: drive, B: drive, CD-ROM, Floppy, USER, Copy, Paste, Snapshot, CONFIG, Reset, Suspend, and Power. The main display area shows the following text:

```
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/ugabios

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...

teknik informatika
.....
..
universitas muhammadiyah surakarta
MY KERNEL$>_
```

At the bottom, a status bar shows the keyboard layout: CTRL + Lbutton + Rbutton enables mo, A:, NUM, CAPS, SCRL, and several empty slots.

9. Menyunting file 'boot.asm', ketikan 'notepad boot.asm', kemudian mengganti tulisan 'Loadingkernel' menjadi 'Belajar membuat BOOTSTRAP-LOADER'.

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

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
[BITS 16]

; Mene
[ORG 0]

; loncat ke label START
jmp     START

; Keterangan format floppy disk format FAT12

```

Find

Find what: Find Next

Direction: ☐ Up ☒ Down

☐ Match case

☐ Wrap around

Cancel

boot.asm - Notepad

File Edit Format View Help

```

        mov     BYTE [absoluteSector], dl
        xor     dx, dx                                ; prepare dx:ax
for operation
        div     WORD [NumHeads]                        ; calculate
        mov     BYTE [absoluteHead], dl
        mov     BYTE [absoluteTrack], al
        ret

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

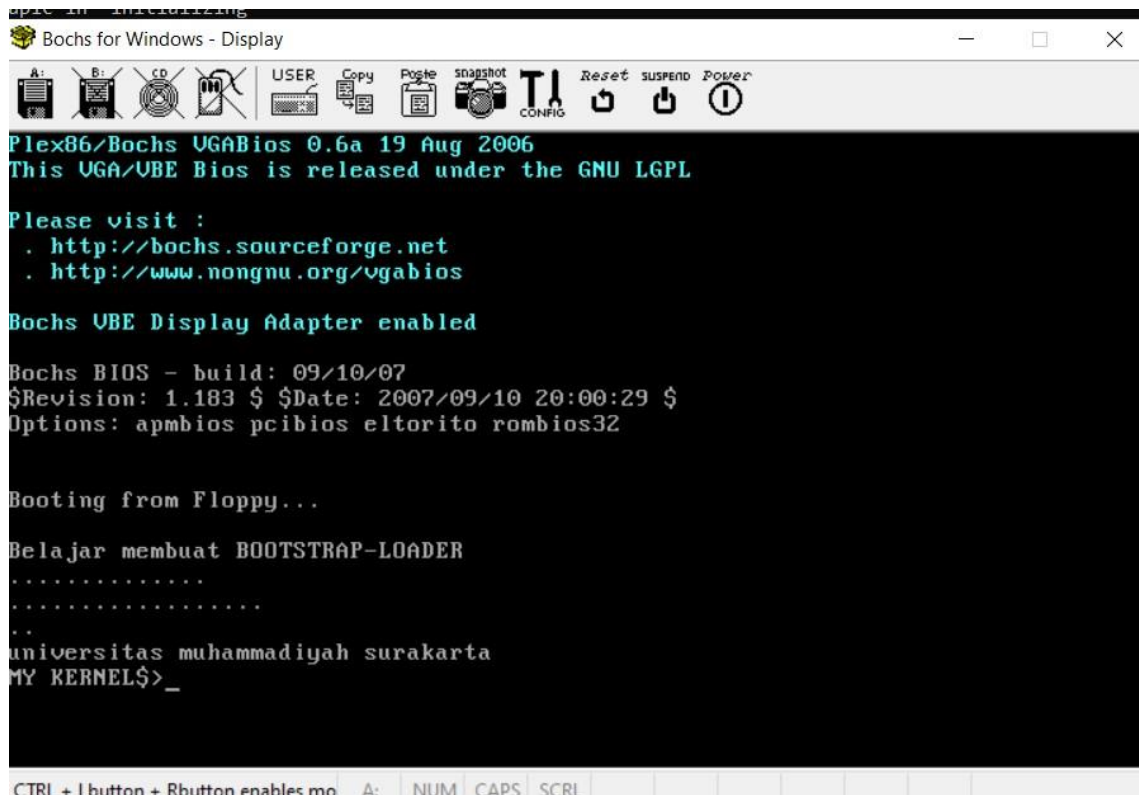
datasector    dw 0x0000
cluster       dw 0x0000
ImageName     db "KERNEL BIN"
msgloading    db 0x0D, 0x0A, "Belajar membuat BOOTSTRAP-LOADER",
0x0D, 0x0A, 0x00
msgCRLF       db 0x0D, 0x0A, 0x00
msgProgress   db ".", 0x00

```

```

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

```



10. Menyiapkan file 'KERNAL.BIN'. Menjalankan perintah 'make kernel' kemudian melakukan pengecekan dengan perintah 'dir'.

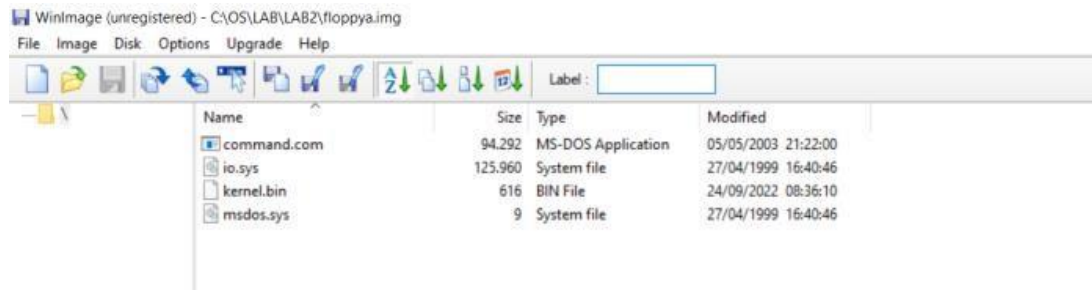
```
C:\OS\LAB\LAB2>make kernel
nasm kernel.asm -o kernel.bin -f bin
```

```
C:\OS\LAB\LAB2>dir
Volume in drive C is Windows
Volume Serial Number is 76CF-0F5A

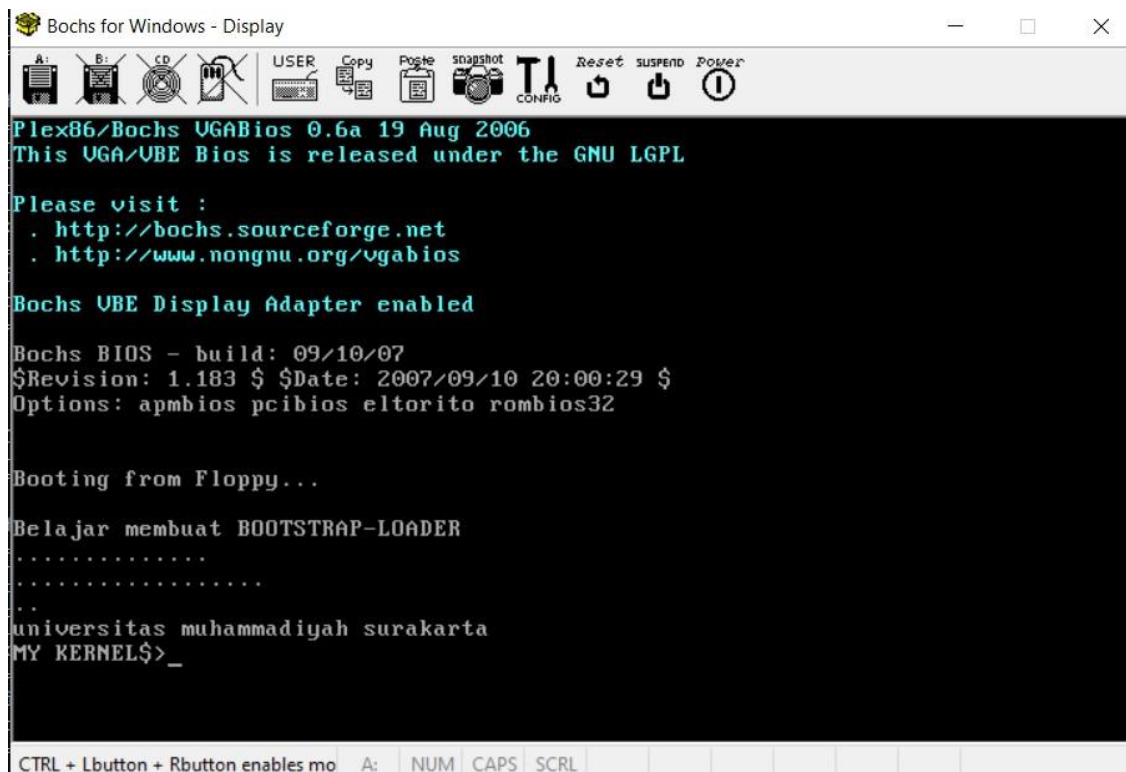
Directory of C:\OS\LAB\LAB2

23/09/2022 16:09 <DIR>      .
23/09/2022 16:09 <DIR>      ..
24/09/2022 08:36          10.130 bochsout.txt
15/12/2008 16:17          1.628 bochsrc.bxrc
24/09/2022 08:29          14.373 boot.asm
24/09/2022 08:34           512 boot.bin
16/09/2015 07:51           512 boots.bin
15/12/2008 00:47           78 dosfp.bat
24/09/2022 08:34        1.474.560 floppy.img
25/09/2019 16:41          7.971 kernel.asm
24/09/2022 08:36           616 kernel.bin
15/12/2008 16:21           227 Makefile
15/12/2008 12:20           44 s.bat
                11 File(s)      1.510.651 bytes
                2 Dir(s)      132.826.214.400 bytes free
```

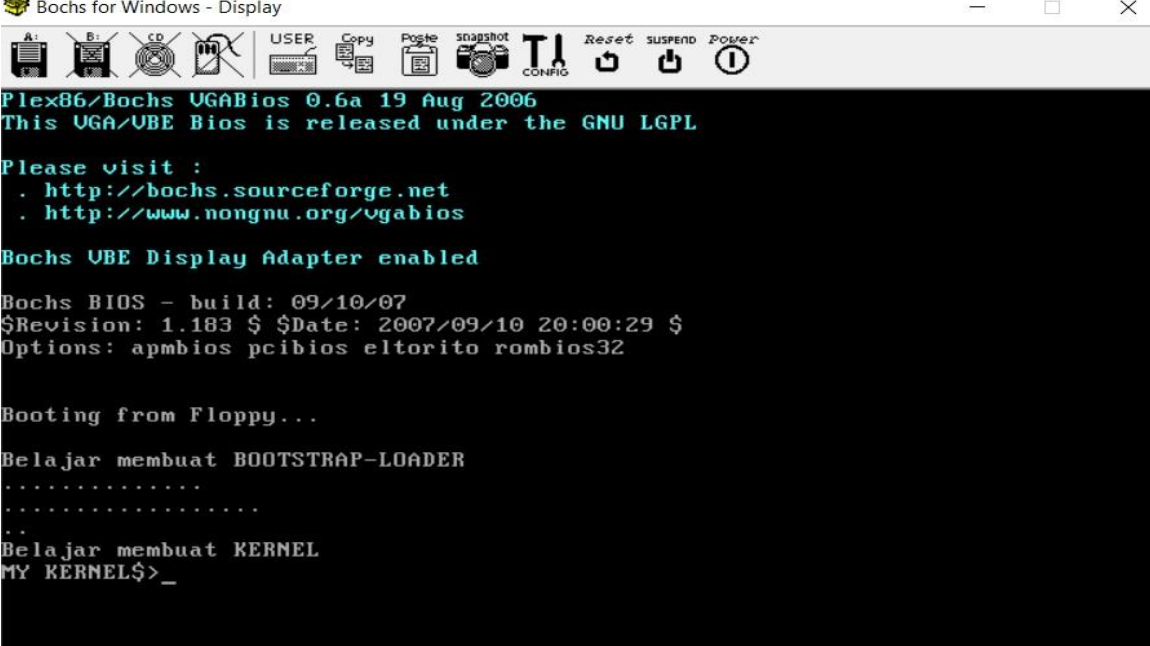

11. Memindahkan file 'kernel.bin' ke dalam file 'floppya.img' menggunakan shareware 'winimage'. Kemudian hasil akhir seperti ditampilkan pada gambar berikut.



12. Selanjutnya melakukan proses boot pada PC Simulator dengan menggunakan 'floppya.img' yang sudah diberi tambahan file 'kernel.bin'.



13. Memodifikasi file 'kernel.asm' dan jalankan perintah 'Notepad kernel.asm' dan mengganti tulisan menjadi 'Belajar membuat KERNEL' dan program selesai dikerjakan.



The screenshot shows a window titled "Bochs for Windows - Display". The window contains a text-based interface for the Bochs BIOS. The text is as follows:

```
Plex86/Bochs VGABios 0.6a 19 Aug 2006
This UGA/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...

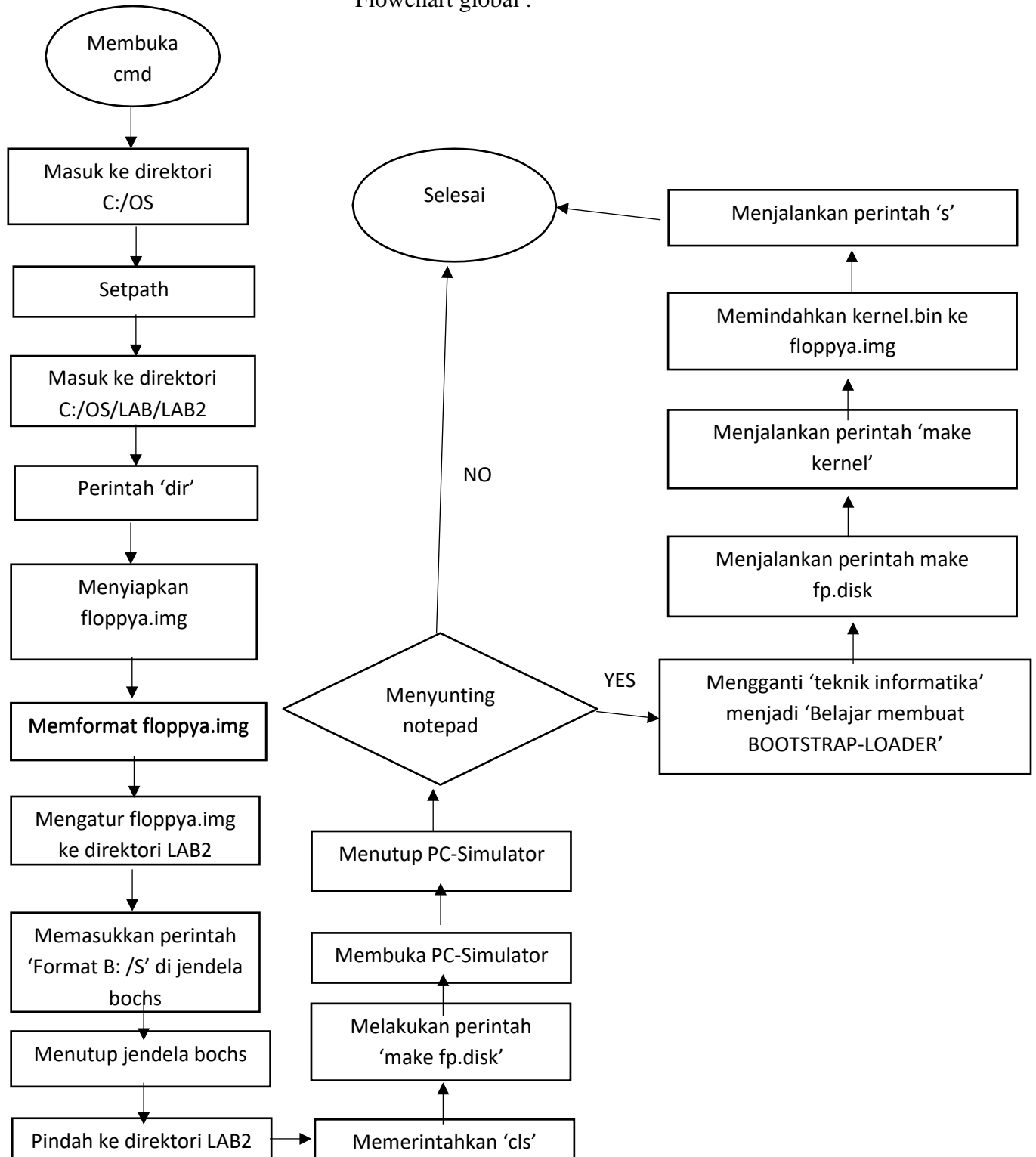
Belajar membuat BOOTSTRAP-LOADER
.....
..
Belajar membuat KERNEL
MY KERNEL$>_
```

Tugas

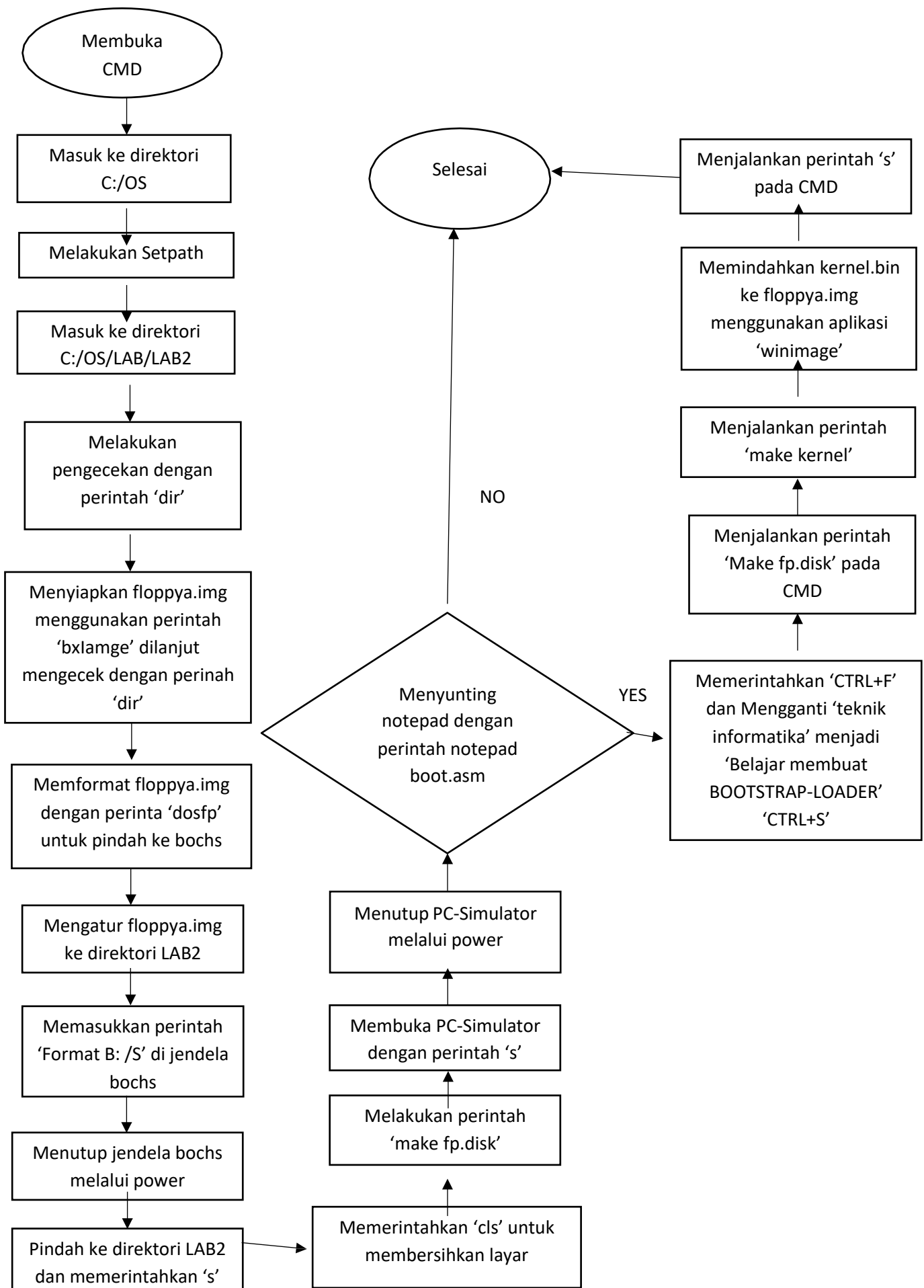
1. Pelajari cara kerja program 'boot.asm' buatlah algoritma dari program tersebut dalam bentuk flowchart. Untuk memudahkan dalam memahami proses boot buatlah dua jenis algoritma, pertama buat algoritma yang bersifat global dan kedua buat algoritma yang bersifat lebih detail.

Jawab :

Flowchart global :



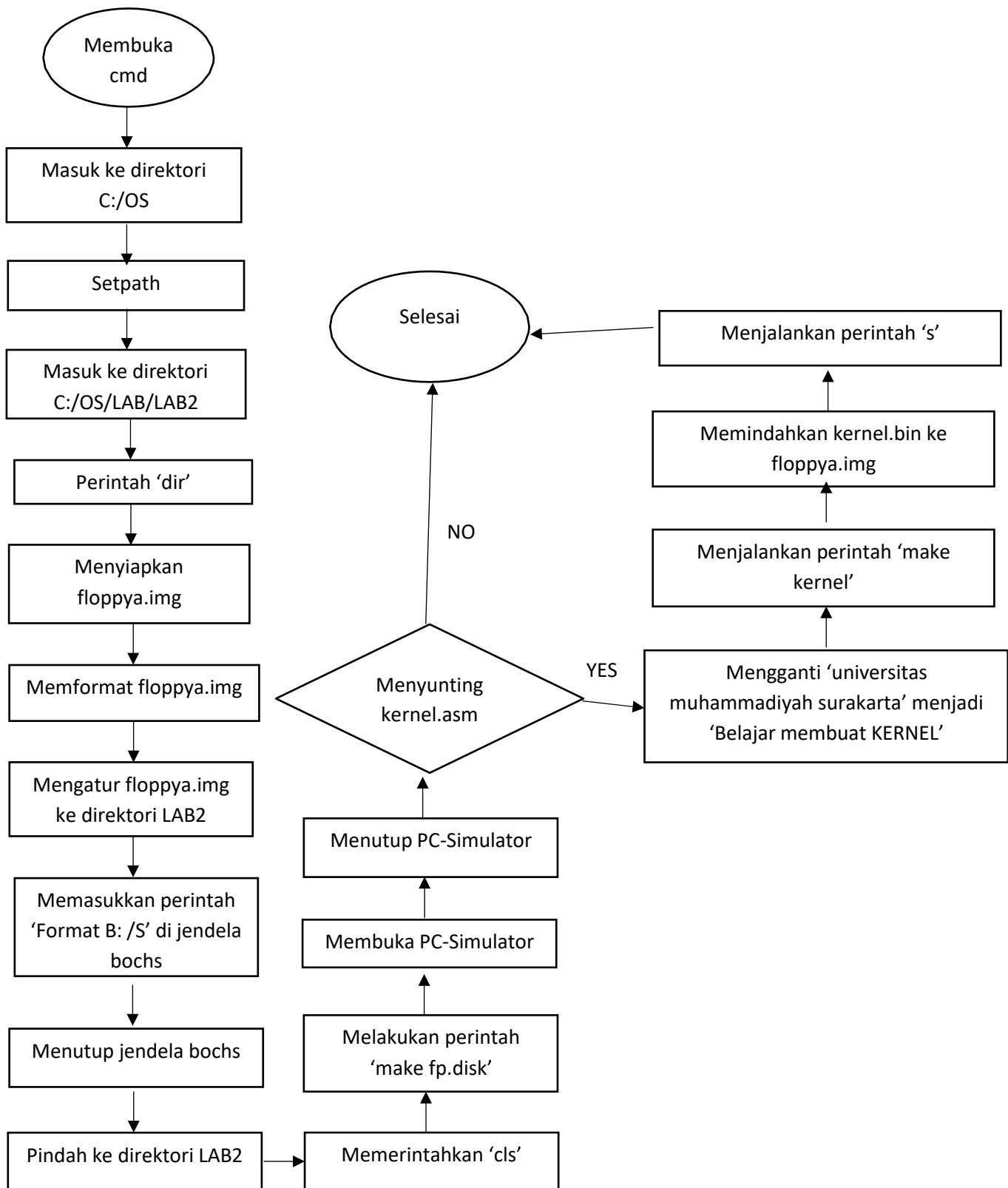
Flowchart detail :



2. Lakukan hal yang sama untuk program 'kernel.asm'.

Jawab :

Flowchart global :



Flowchart detail :

