

Laporan Praktikum Sistem Operasi

Modul 1

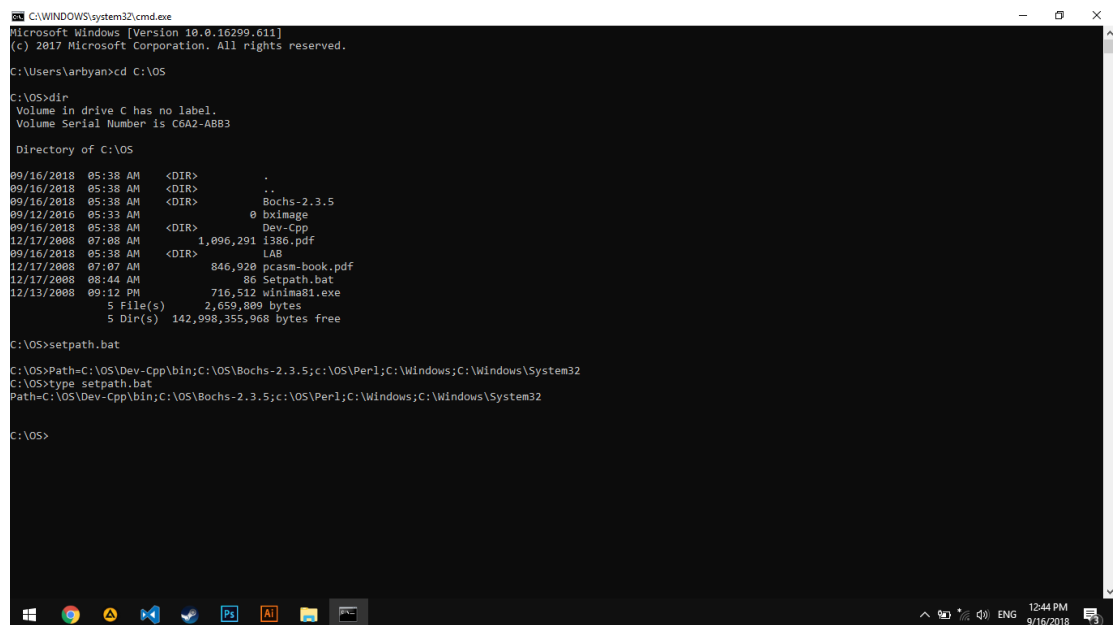
Pengenalan Sistem Pengembangan OS dengan PC Simulator 'Bochs'

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Kelas : E

1. Menuju ke direktori kerja



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.16299.611]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\arbyan>cd C:\OS

C:\OS>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-AB83

Directory of C:\OS

09/16/2018 05:38 AM <DIR>      .
09/16/2018 05:38 AM <DIR>      ..
09/16/2018 05:38 AM <DIR>      Bochs-2.3.5
09/12/2016 05:33 AM <DIR>      0 bimage
09/16/2018 05:38 AM <DIR>      Dev-Cpp
12/17/2008 07:08 AM <DIR>      1,096,291 1386.pdf
09/16/2018 05:38 AM <DIR>      LAB
12/17/2008 07:07 AM <DIR>      846,920 pcasm-book.pdf
12/17/2008 08:44 AM <DIR>      86 Setpath.bat
12/13/2008 09:12 PM <DIR>      716,512 winima81.exe
               5 File(s)      2,659,809 bytes
               5 Dir(s)  142,998,355,968 bytes free

C:\OS>setpath.bat
C:\OS>Path=C:\OS\Dev-Cpp\bin;C:\OS\Bochs-2.3.5;c:\OS\Perl;c:\Windows;C:\Windows\System32
C:\OS>type setpath.bat
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

The screenshot shows a Windows command prompt window with the following commands and output:

```
C:\WINDOWS\system32\cmd.exe
C:\OS>cd C:\OS\LAB\LAB1
C:\OS\LAB\LAB1>Notepad boot.asm
C:\OS\LAB\LAB1>
```

The Notepad window displays the assembly code for 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 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     dw 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
DriveNumber    db 0x00
Flags          db 0x00
Signature      db 0x29
VolumeID       dd 0xFFFFFFFF
VolumeLabel    db "QUASI  BOOT"
SystemID       db "FAT12  "
```

3. Sekilas tentang Makefile

The screenshot shows a Windows command prompt window with the following commands and output:

```
C:\WINDOWS\system32\cmd.exe
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 Newbiggin <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>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\OS\LAB\LAB1

09/16/2018  11:04 AM  <DIR>          .
09/16/2018  11:04 AM  <DIR>          ..
09/16/2018  11:41 AM               10,239 bochsout.txt
12/15/2008  11:17 PM               1,628 bochsrtc.bxrc
10/17/2016  09:36 PM             14,339 boot.asm
09/16/2018  12:54 PM                512 boot.bin
09/16/2018  11:34 AM                512 boots.bin
09/16/2007  11:22 PM             18,432 bximage.exe
09/11/2017  05:21 PM            10,321,920 c.img
02/27/2007  03:50 AM             342,816 dd.exe
12/15/2008  07:47 AM                78 dosfp.bat
09/16/2018  12:54 PM            1,474,560 floppya.img
12/14/2008  06:45 PM               7,966 kernel.asm
12/15/2008  11:21 PM                227 Makefile
12/15/2008  07:20 PM                44 s.bat
01/31/2000  12:00 PM             261,128 tdump.exe
               14 File(s)      12,453,593 bytes
               2 Dir(s)      142,992,801,792 bytes free

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

The Notepad window displays the Makefile for LAB01:

```
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
```

4. Mengenal "BOOT DISK"

```
C:\WINDOWS\system32\cmd.exe
C:\OS\LAB\LAB1>del floppy.img/P
C:\OS\LAB\LAB1>del floppy.img, Delete (Y/N)? y
C:\OS\LAB\LAB1>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-A8B3

Directory of C:\OS\LAB\LAB1

09/16/2018 12:57 PM <DIR> .
09/16/2018 12:57 PM <DIR> ..
09/16/2018 11:41 AM      10,239 bochsout.txt
12/15/2008 11:17 PM      1,628 bochsrc.bxrc
10/17/2016 09:36 PM     14,339 boot.asm
09/16/2018 12:54 PM       512 boot.bin
09/16/2018 11:34 AM       512 boots.bin
09/16/2007 11:22 PM     18,432 bximage.exe
09/11/2017 05:21 PM    10,321,920 c.img
02/27/2007 03:50 AM     342,016 dd.exe
12/15/2008 07:47 AM       78 dosfp.bat
12/14/2008 06:45 PM     7,966 kernel.asm
12/15/2008 11:21 PM       227 Makefile
12/15/2008 07:20 PM       44 s.bat
01/31/2000 12:00 PM     261,120 tdump.exe
               13 File(s)    10,979,033 bytes
               2 Dir(s)    142,994,116,608 bytes free

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
```

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

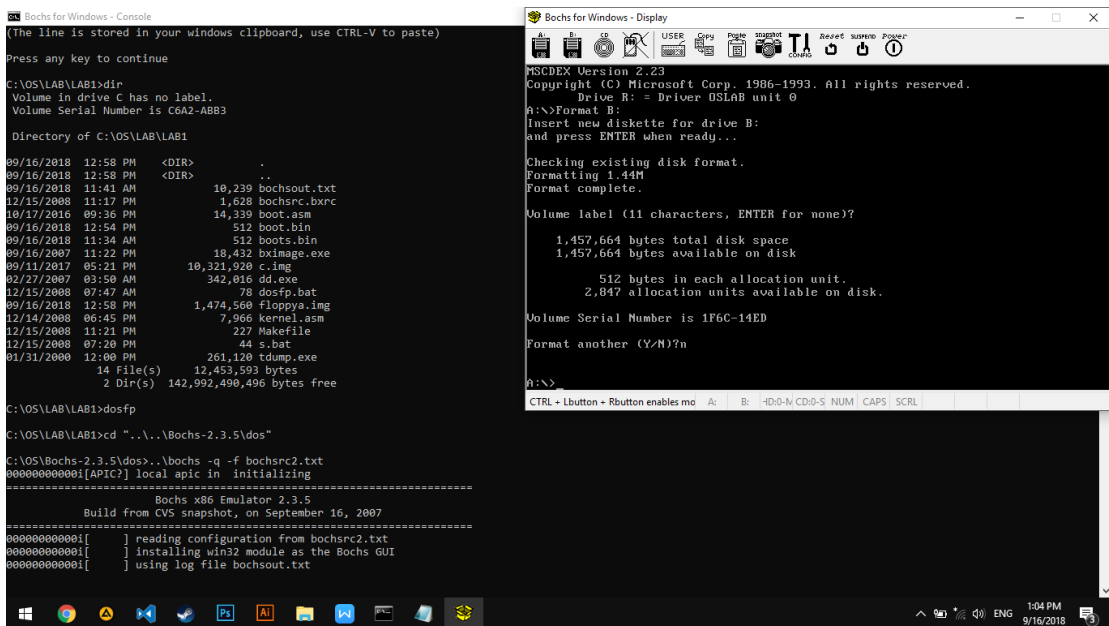
I wrote 1474560 bytes to Floppya.img.

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)

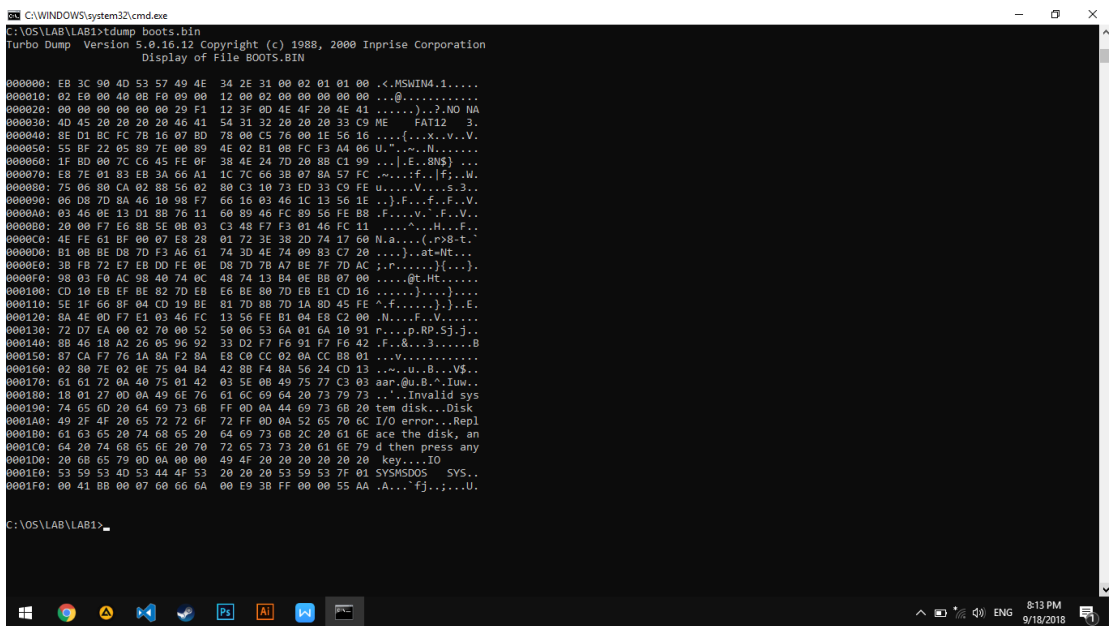
Press any key to continue

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

5. Format Disk



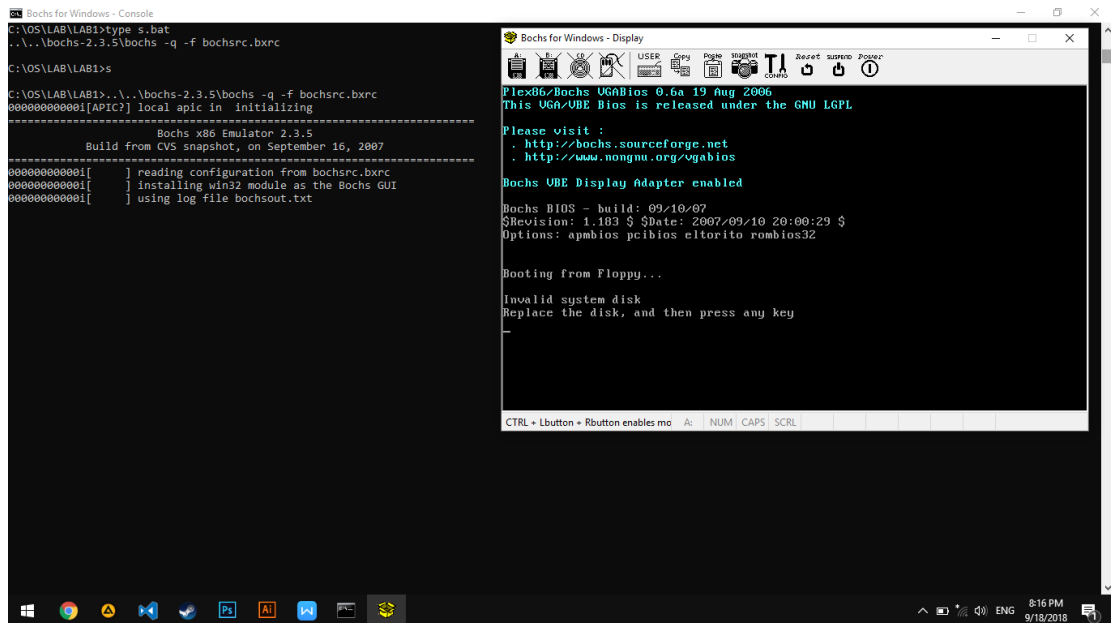
6. Melihat data dalam boot sector



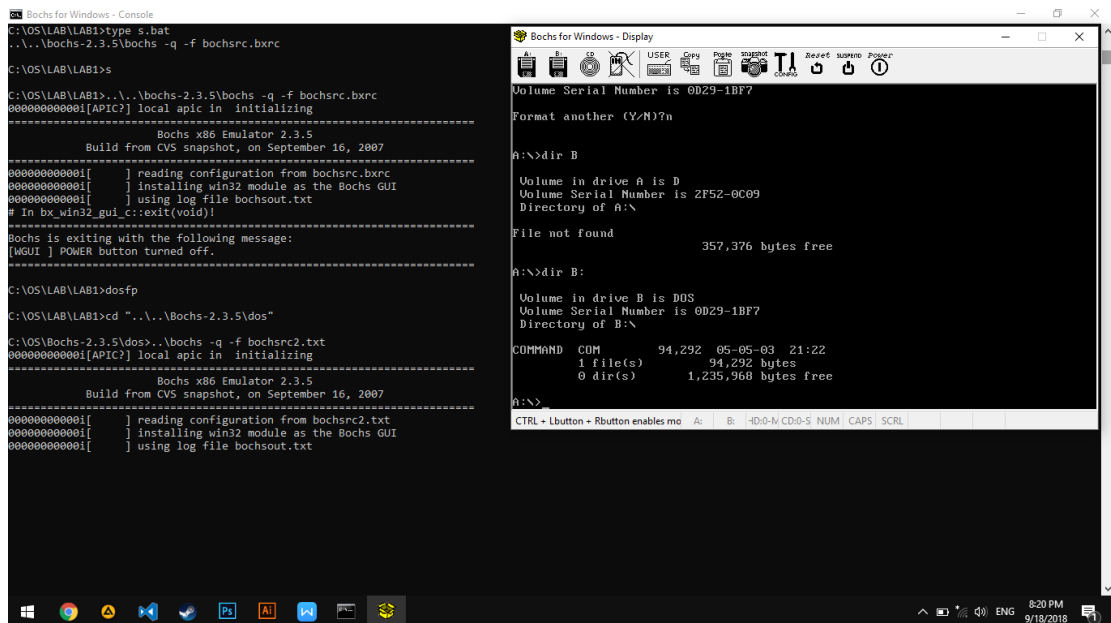
Melihat data bootsectordengan program “tdump.exe”



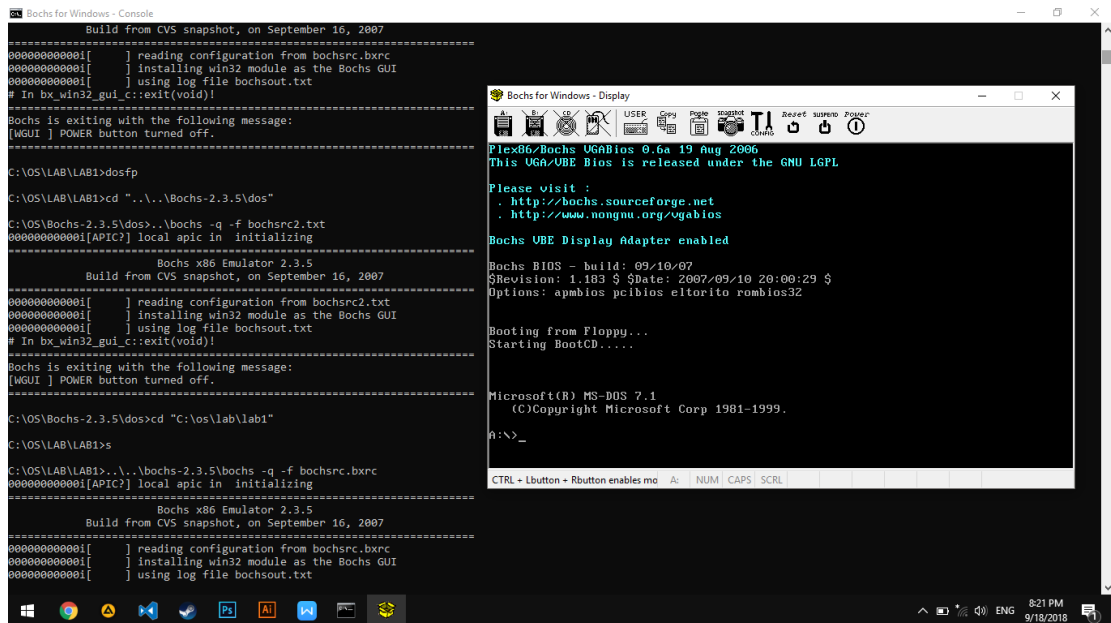
Isi dari file “s.bat”



Booting tidak berhasil karena tidak menemukan diskboot



Menambahkan system file



Proses booting berhasil

Tugas Praktikum Sistem Operasi

1. ASCII

ASCII merupakan standar kode internasional dalam bentuk huruf dan simbol yang bersifat universal

- Tabel kode ASCII

Dec	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0	000	NUL (null)	32	20	040	 	Space	64	40	100	@	@	96	60	140	`	`
1	1	001	SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	ETX (end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4	004	EOT (end of transmission)	36	24	044	$	\$	68	44	104	D	D	100	64	144	d	d
5	5	005	ENQ (enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6	006	ACK (acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7	007	BEL (bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8	010	BS (backspace)	40	28	050	((72	48	110	H	H	104	68	150	h	h
9	9	011	TAB (horizontal tab)	41	29	051))	73	49	111	I	I	105	69	151	i	i
10	A	012	LF (NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
11	B	013	VT (vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
12	C	014	FF (NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
13	D	015	CR (carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
14	E	016	SO (shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
15	F	017	SI (shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
16	10	020	DLE (data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
17	11	021	DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12	022	DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13	023	DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14	024	DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15	025	NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16	026	SYN (synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
23	17	027	ETB (end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
24	18	030	CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19	031	EM (end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
26	1A	032	SUB (substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
27	1B	033	ESC (escape)	59	3B	073	;	;	91	5B	133	[[123	7B	173	{	{
28	1C	034	FS (file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174	|	
29	1D	035	GS (group separator)	61	3D	075	=	=	93	5D	135]]	125	7D	175	}	}
30	1E	036	RS (record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
31	1F	037	US (unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177		DEL

Source: www.LookupTables.com

2. Daftar Instruksi dalam bahasa assembly

1. ACALL (Absolute Call)

ACALL berfungsi untuk memanggil sub rutin program

2. ADD (Add Immediate Data)

ADD berfungsi untuk menambah 8 bit data langsung ke dalam isi akumulator dan menyimpan hasilnya pada akumulator.

3. ADDC (Add Carry Plus Immediate Data to Accumulator)

ADDC berfungsi untuk menambahkan isi carry flag (0 atau 1) ke dalam isi akumulator. Data langsung 8 bit ditambahkan ke akumulator.

4. AJMP (Absolute Jump)

AJMP adalah perintah jump mutlak. Jump dalam 2 KB dimulai dari alamat yang mengikuti perintah AJMP. AJMP berfungsi untuk mentransfer kendali program ke lokasi dimana alamat dikalkulasi dengan cara yang sama dengan perintah ACALL. Konter program ditambahkan dua

kali dimana perintah AJMP adalah perintah 2-byte. Konter program di-load dengan a10 – a0 11 bits, untuk membentuk alamat tujuan 16-bit.

5. ANL (logical AND memori ke akumulator)

ANL berfungsi untuk mengAND-kan isi alamat data dengan isi akumulator.

6. CJNE (Compare Indirect Address to Immediate Data)

CJNE berfungsi untuk membandingkan data langsung dengan lokasi memori yang dialamati oleh register R atau Akumulator A. apabila tidak sama maka instruksi akan menuju ke alamat kode.

Format : CJNE R,#data,Alamat kode.

7. CLR (Clear Accumulator)

CLR berfungsi untuk mereset data akumulator menjadi 00H.

Format : CLR A

8. CPL (Complement Accumulator)

CPL berfungsi untuk mengkomplemen isi akumulator.

9. DA (Decimal Adjust Accumulator)

DA berfungsi untuk mengatur isi akumulator ke padanan BCD, steleah penambahan dua angka BCD.

10. DEC (Decrement Indirect Address)

DEC berfungsi untuk mengurangi isi lokasi memori yang ditujukan oleh register R dengan 1, dan hasilnya disimpan pada lokasi tersebut.

11. DIV (Divide Accumulator by B)

DIV berfungsi untuk membagi isi akumulator dengan isi register B. Akumulator berisi hasil bagi, register B berisi sisa pembagian.

12. DJNZ (Decrement Register And Jump Id Not Zero)

DJNZ berfungsi untuk mengurangi nilai register dengan 1 dan jika hasilnya sudah 0 maka instruksi selanjutnya akan dieksekusi. Jika belum 0 akan menuju ke alamat kode.

13. INC (Increment Indirect Address)

INC berfungsi untuk menambahkan isi memori dengan 1 dan menyimpannya pada alamat tersebut.

14. JB (Jump if Bit is Set)

JB berfungsi untuk membaca data per satu bit, jika data tersebut adalah 1 maka akan menuju ke alamat kode dan jika 0 tidak akan menuju ke alamat kode.

15. JBC (Jump if Bit Set and Clear Bit)

Bit JBC, berfungsi sebagai perintah rel menguji yang terspesifikasikan secara bit. Jika bit di-set, maka Jump dilakukan ke alamat relatif dan yang terspesifikasi secara bit di dalam perintah dibersihkan. Segmen program berikut menguji bit yang kurang signifikan (LSB: Least Significant Byte), dan jika diketemukan bahwa ia telah di-set, program melompat ke READ lokasi. JBC juga berfungsi membersihkan LSB dari akumulator.

16. JC (Jump if Carry is Set)

Instruksi JC berfungsi untuk menguji isi carry flag. Jika berisi 1, eksekusi menuju ke alamat kode, jika berisi 0, instruksi selanjutnya yang akan dieksekusi.

17. JMP (Jump to sum of Accumulator and Data Pointer)

Instruksi JMP berfungsi untuk memerintahkan loncat kesuatu alamat kode tertentu.

Format : JMP alamat kode.

18. JNB (Jump if Bit is Not Set)

Instruksi JNB berfungsi untuk membaca data per satu bit, jika data tersebut adalah 0 maka akan menuju ke alamat kode dan jika 1 tidak akan menuju ke alamat kode.

Format : JNB alamat bit,alamat kode.

19. JNC (Jump if Carry Not Set)

JNC berfungsi untuk menguji bit Carry, dan jika tidak di-set, maka sebuah lompatan akan dilakukan ke alamat relatif yang telah ditentukan.

20. JNZ (Jump if Accumulator Not Zero)

JNZ adalah mnemonik untuk instruksi jump if not zero (lompat jika tidak nol). Dalam hal ini suatu lompatan akan terjadi bilamana bendera nol dalam keadaan "clear", dan tidak akan terjadi lompatan bilamana bendera nol tersebut dalam keadaan set. Andaikan bahwa JNZ 7800H disimpan pada lokasi 2100H. Jika Z=0, instruksi berikutnya akan berasal dari lokasi 7800H: dan bilamana Z=1, program akan turun ke instruksi urutan berikutnya pada lokasi 2101H.

21. JZ (Jump if Accumulator is Zero)

JZ berfungsi untuk menguji konten-konten akumulator. Jika bukan nol, maka lompatan dilakukan ke alamat relatif yang ditentukan dalam perintah.

22. LCALL (Long Call)

LCALL berfungsi untuk memungkinkan panggilan ke subrutin yang berlokasi dimanapun dalam memori program 64K. Operasi LCALL berjalan seperti berikut:

- Menambahkan ke dalam konter program sebanyak 3, karena perintahnya adalah perintah 3-byte.
- Menambahkan penunjuk stack sebanyak 1.
- Menyimpan byte yang lebih rendah dari konter program ke dalam stack.
- Menambahkan penunjuk stack.
- Menyimpan byte yang lebih tinggi dari program ke dalam stack.
- Me-load konter program dengan alamat tujuan 16-bit.

23. . LJM (Long Jump)

Long Jump berfungsi untuk memungkinkan lompatan tak bersyarat kemana saja dalam lingkup ruang memori program 64K. LCALL adalah perintah 3-byte. Alamat tujuan 16-bit ditentukan secara langsung dalam perintah tersebut. Alamat tujuan ini di-load ke dalam konter program oleh perintah LJM.

24. MOV (Move From Memory)

MOV berfungsi untuk memindahkan isi akumulator/register atau data dari nilai luar atau alamat lain.

25. MOVC (Move From Codec Memory)

Instruksi MOVC berfungsi untuk mengisi accumulator dengan byte kode atau konstanta dari program memory. Alamat byte tersebut adalah hasil penjumlahan unsigned 8 bit pada accumulator dan 16 bit register basis yang dapat berupa data pointer atau program counter. Instruksi ini tidak mempengaruhi flag apapun juga.

26. MOVX (Move Accumulator to External Memory Addressed by Data Pointer)

MOVX berfungsi untuk memindahkan isi akumulator ke memori data eksternal yang alamatnya ditunjukkan oleh isi data pointer.

27. MUL (Multiply)

MUL AB berfungsi untuk mengalikan unsigned 8 bit integer pada accumulator dan register B. Byte rendah (low order) dari hasil perkalian akan disimpan dalam accumulator sedangkan byte tinggi (high order) akan disimpan dalam register B. Jika hasil perkalian lebih besar dari 255 (0FFh), overflow flag akan bernilai '1'. Jika hasil perkalian lebih kecil atau sama dengan 255, overflow flag akan bernilai '0'. Carry flag akan selalu

dikosongkan.

28. NOP (No Operation)

Fungsi NOP adalah eksekusi program akan dilanjutkan ke instruksi berikutnya. Selain PC, instruksi ini tidak mempengaruhi register atau flag apapun juga

.

29. ORL (Logical OR Immediate Data to Accumulator)

Instruksi ORL berfungsi sebagai instruksi Gerbang logika OR yang akan menjumlahkan Accumulator terhadap nilai yang ditentukan.

Format : ORL A,#data.

30. POP (Pop Stack to Memory)

Instruksi POP berfungsi untuk menempatkan byte yang ditunjukkan oleh stack pointer ke suatu alamat data.

31. PUSH (Push Memory onto Stack)

Instruksi PUSH berfungsi untuk menaikkan stack pointer kemudian menyimpan isinya ke suatu alamat data pada lokasi yang ditunjuk oleh stack pointer.

32. RET (Return from subroutine)

Intruksi RET berfungsi untuk kembali dari suatu subrutin program ke alamat terakhir subrutin tersebut di panggil.

33. RETI (Return From Interrupt)

RETI berfungsi untuk mengambil nilai byte tinggi dan rendah dari PC dari stack dan mengembalikan kondisi logika interrupt agar dapat menerima interrupt lain dengan prioritas yang sama dengan prioritas interrupt yang baru saja diproses. Stack pointer akan dikurangi dengan 2. Instruksi ini tidak mempengaruhi flag apapun juga. Nilai PSW tidak akan dikembalikan secara otomatis ke kondisi sebelum interrupt. Eksekusi program akan dilanjutkan pada alamat yang diambil tersebut. Umumnya alamat tersebut adalah alamat setelah lokasi dimana terjadi interrupt. Jika interrupt dengan prioritas sama atau lebih rendah tertunda saat RETI dieksekusi, maka satu instruksi lagi akan dieksekusi sebelum interrupt yang tertunda tersebut diproses.

34. RL (Rotate Accumulator Left)

Instruksi RL berfungsi untuk memutar setiap bit dalam akumulator satu posisi ke kiri.

35. . RLC (Rotate Left through Carry)

Fungsi : Memutar (Rotate) Accumulator ke Kiri (Left) Melalui Carry Flag. Kedelapan bit accumulator dan carry flag akan diputar satu bit ke kiri secara bersama-sama. Bit 7 akan dirotasi ke carry flag, nilai carry flag akan berpindah ke posisi bit 0. Instruksi ini tidak mempengaruhi flag lain.

36. RR (Rotate Right)

Fungsi : Memutar (Rotate) Accumulator ke Kanan (Right). Kedelapan bit accumulator akan diputar satu bit ke kanan. Bit 0 akan dirotasi ke posisi bit 7. Instruksi ini tidak mempengaruhi flag apapun juga.

37. RRC (Rotate Right through Carry)

Fungsi : Memutar (Rotate) Accumulator ke Kanan (Right) Melalui Carry Flag. Kedelapan bit accumulator dan carry flag akan diputar satu bit ke kanan secara bersama-sama. Bit 0 akan dirotasi ke carry flag, nilai carry flag akan berpindah ke posisi bit 7. Instruksi ini tidak mempengaruhi flag lain.

38. SETB (set Carry flag)

Instruksi SETB berfungsi untuk menset carry flag.

39. SJMP (Short Jump)

Sebuah Short Jump berfungsi untuk mentransfer kendali ke alamat tujuan dalam 127 bytes yang mengikuti dan 128 yang mengawali perintah SJMP. Alamat tujuannya ditentukan sebagai sebuah alamat relative 8-bit. Ini adalah Jump tidak bersyarat. Perintah SJMP menambahkan konter program sebanyak 2 dan menambahkan alamat relatif ke dalamnya untuk mendapatkan alamat tujuan. Alamat relatif tersebut ditentukan dalam perintah sebagai 'SJMP rel'.

40. SUBB (Subtract With Borrow)

Fungsi : Pengurangan (Subtract) dengan Peminjaman (Borrow). SUBB mengurangi variabel yang tertera pada operand kedua dan carry flag sekaligus dari accumulator dan menyimpan hasilnya pada accumulator. SUBB akan memberi nilai '1' pada carry flag jika peminjaman ke bit 7 dibutuhkan dan mengosongkan C jika tidak dibutuhkan peminjaman. Jika C bernilai '1' sebelum mengeksekusi SUBB, hal ini menandakan bahwa terjadi peminjaman pada proses pengurangan sebelumnya, sehingga carry flag dan source byte akan dikurangkan dari accumulator secara bersama-sama. AC akan bernilai '1' jika peminjaman ke bit 3 dibutuhkan dan mengosongkan AC jika tidak dibutuhkan peminjaman. OV akan bernilai '1' jika ada peminjaman ke bit 6 namun tidak ke bit 7 atau ada peminjaman ke bit 7 namun tidak ke bit 6. Saat mengurangi signed integer, OV menandakan adanya angka negative sebagai hasil dari pengurangan angka negatif dari angka positif atau adanya angka positif sebagai hasil dari pengurangan angka positif dari

angka negative. Addressing mode yang dapat digunakan adalah: register, direct, register indirect, atau immediate data.

41. SWAP (Swap Nibbles)

Fungsi : Menukar (Swap) Upper Nibble dan Lower Nibble dalam Accumulator. SWAP A akan menukar nibble (4 bit) tinggi dan nibble rendah dalam accumulator. Operasi ini dapat dianggap sebagai rotasi 4 bit dengan RR atau RL. Instruksi ini tidak mempengaruhi flag apapun juga.

42. XCH (Exchange Bytes)

Fungsi : Menukar (Exchange) Accumulator dengan Variabel Byte. XCH akan mengisi accumulator dengan variabel yang tertera pada operand kedua dan pada saat yang sama juga akan mengisikan nilai accumulator ke dalam variabel tersebut. Addressing mode yang dapat digunakan adalah: register, direct, atau register indirect.

43. XCHD (Exchange Digits)

Fungsi : Menukar (Exchange) Digit. XCHD menukar nibble rendah dari accumulator, yang umumnya mewakili angka heksadesimal atau BCD, dengan nibble rendah dari internal data memory yang diakses secara indirect. Nibble tinggi kedua register tidak akan terpengaruh. Instruksi ini tidak mempengaruhi flag apapun juga.

44. XRL (Exclusive OR Logic)

Fungsi : Logika Exclusive OR untuk Variabel Byte XRL akan melakukan operasi bitwise logika exclusive OR antara kedua variabel yang dinyatakan. Hasilnya akan disimpan pada destination byte. Instruksi ini tidak mempengaruhi flag apapun juga. Kedua operand mampu menggunakan enam kombinasi addressing mode. Saat destination byte adalah accumulator, source byte dapat berupa register, direct, register indirect, atau immediate data. Saat destination byte berupa direct address, source byte dapat berupa accumulator atau immediate data.

Modul 2

Mengenal Proses Pembuatan 'DISK BOOT'

Nama : Anang Fahrudin Arbi

NIM : L200170106

Kelas : E

1. Membuka direktori kerja dan membuka setpath

```
Microsoft Windows [Version 10.0.16299.611]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\arbyan>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 C6A2-ABB3

Directory of C:\OS\LAB\LAB2

09/19/2018  12:10 PM    <DIR>          .
09/19/2018  12:10 PM    <DIR>          ..
09/19/2018  12:00 PM             10,130 bochs.log
12/15/2008  11:18 PM             1,625 bochsrc.bxrc
09/19/2018  12:08 PM             15,922 boot.asm
09/19/2018  01:23 PM              512 boot.bin
09/16/2007  11:22 PM            18,432 bximage.exe
02/27/2007  03:50 AM           342,016 dd.exe
12/15/2008  08:52 PM              78 dosfp.bat
09/19/2018  11:45 AM          1,474,560 floppy.img
09/19/2018  12:09 PM             7,966 kernel.asm
09/19/2018  01:31 PM              611 kernel.bin
12/15/2008  11:21 PM              228 Makefile
12/15/2008  07:20 PM              44 s.bat
               12 File(s)          1,872,124 bytes
               2 Dir(s)  139,729,088,512 bytes free

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

2. Menyiapkan file "floppya.img"

```

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 'floppya.img' already exists. Are you sure you want to replace it?
Please type yes or no. [no] yes

Writing: [] Done.

I wrote 1474560 bytes to floppya.img.

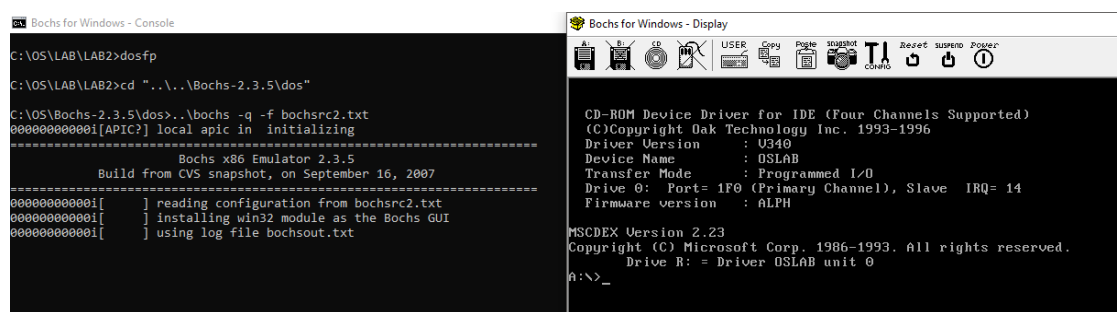
The following line should appear in your bochsrc:
    floppya: image="floppya.img", status=inserted
(The line is stored in your windows clipboard, use CTRL-V to paste)

Press any key to continue

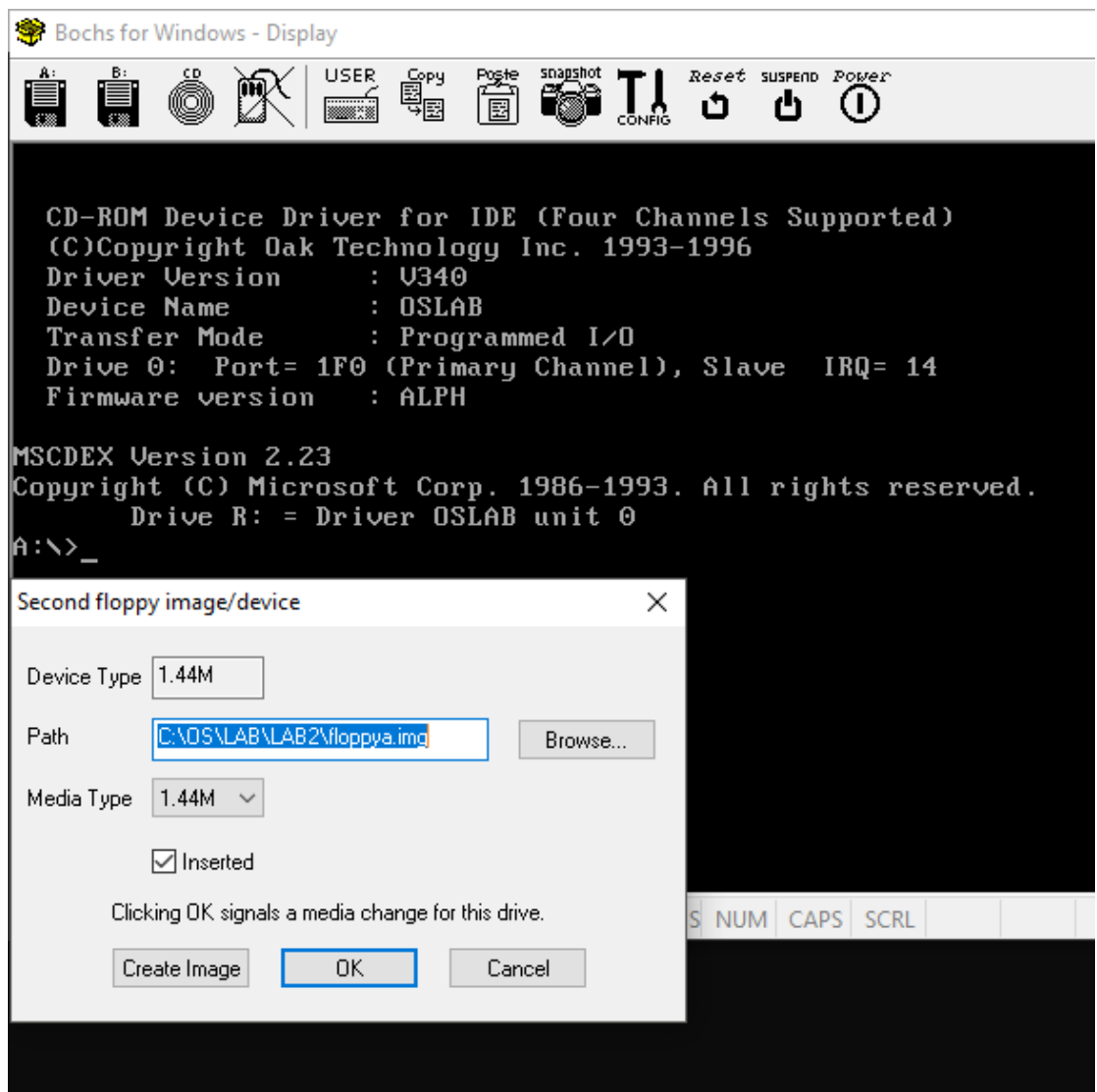
C:\OS\LAB\LAB2>

```

3. Mem-format "floppya.img"



4. Mengatur lokasi file image



5. Perintah format


```

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.
Formatting 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.

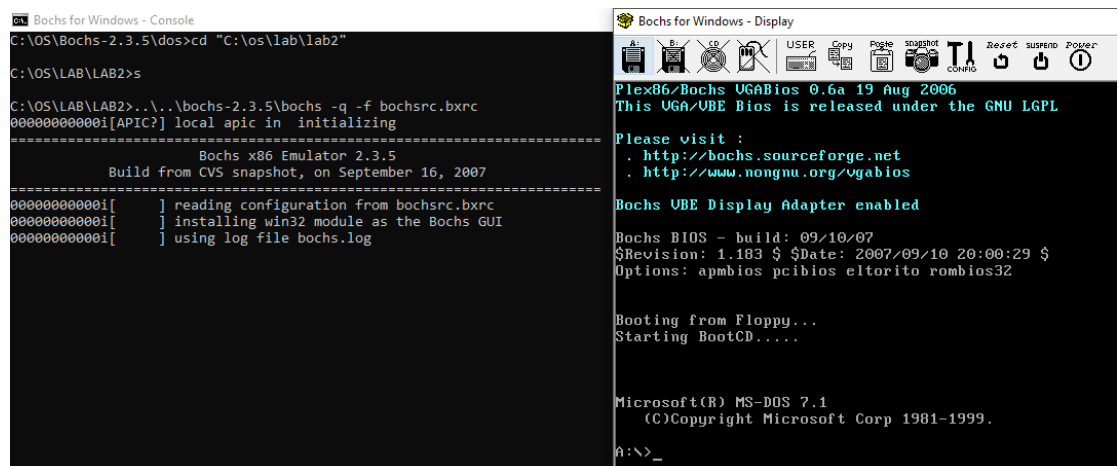
Volume Serial Number is 4364-1515

Format another (Y/N)?n

A:\>_

```

6. Menjalankan proses boot



The screenshot shows two windows from the Bochs for Windows application. The 'Console' window on the left displays the command prompt and the execution of the bochs emulator. The 'Display' window on the right shows the BIOS boot screen.

Bochs for Windows - Console

```

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 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...
Starting BootCD.....

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

A:\>_

```

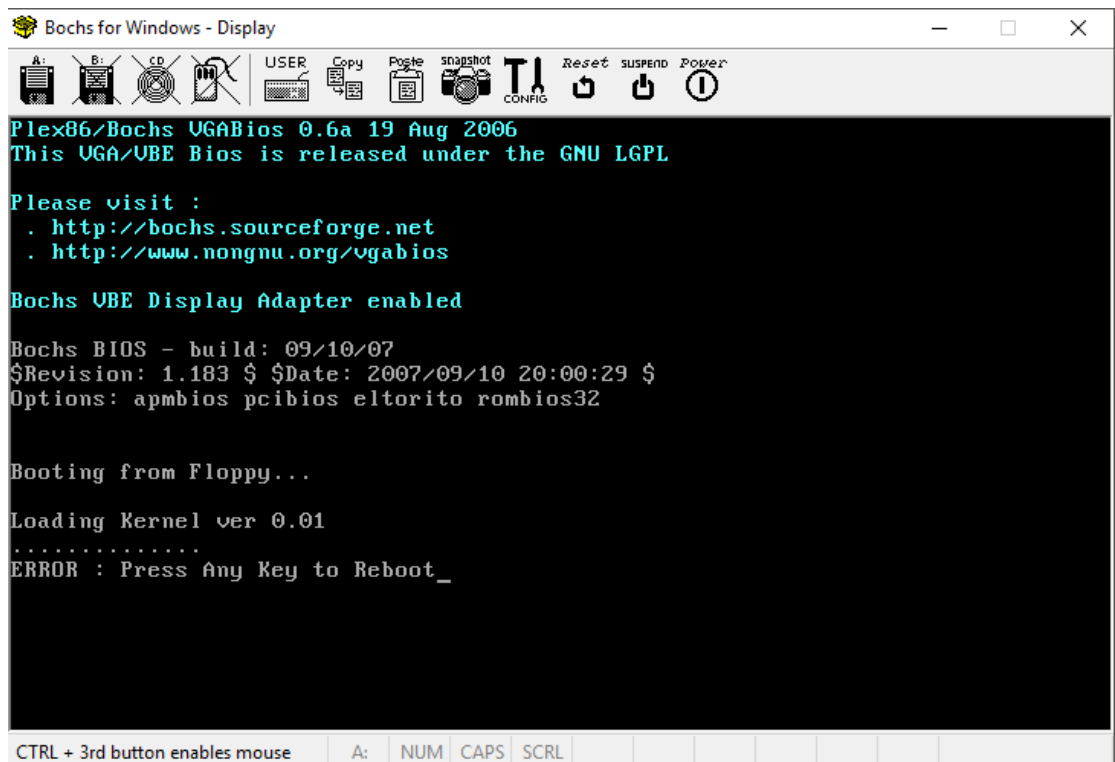
7. Kompilasi source code 'boot.asm' dan memindahkan hasilnya ke bootsector

C:\WINDOWS\system32\cmd.exe

```
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



9. Menyunting file "boot.asm"

```

C:\WINDOWS\system32\cmd.exe
C:\OS\LAB\LAB2>notepad boot.asm
C:\OS\LAB\LAB2>notepad boot.asm
C:\OS\LAB\LAB2>

boot.asm - Notepad
File Edit Format View Help
; Di awali dan diakhiri dengan tanda :
; -- 0x00 akhir baris
; -- 0x0A baris baru
; -- 0x00 Karakter 'NULL' pembatas dengan data di bawahnya
;=====
msgLoading db 0x00, 0x0A, "Belajar membuat BOOTSTRAP-LOADER", 0x00, 0x0A, 0x00
msgLoading db 0x00, 0x0A, "Loading Kernel ver 0.01", 0x00, 0x0A, 0x00
msgCRLF db 0x00, 0x0A, 0x00
msgProgress db ".", 0x00
;=====
; Teks yang di tampilkan saat terjadi kesalahan BOOT
;=====
msgFailure db 0x00, 0x0A, "ANANG FAHRUDDIN ARBI - L200170106", 0x00
msgFailure db 0x00, 0x0A, "ERROR : Press Any Key to Reboot", 0x00
;=====

```

```

Bochs for Windows - Console
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
000000000001[APIC?] local apic in initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000001[ ] reading configuration from bochsrc.bxrc
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log

Bochs for Windows - Display
Plex86/Bochs UGA Bios 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...

Belajar membuat BOOTSTRAP-LOADER
.....
ANANG FAHRUDDIN ARBI - L200170106_

```

*setelah disunting

11. Menyiapkan file 'kernel.bin'

```

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

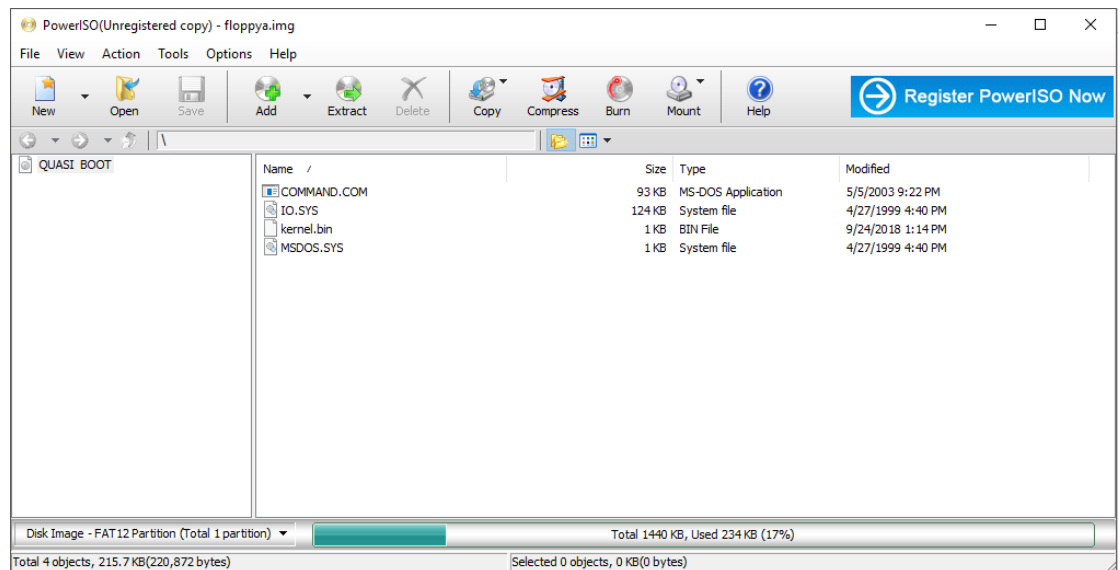
C:\OS\LAB\LAB2>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\OS\LAB\LAB2

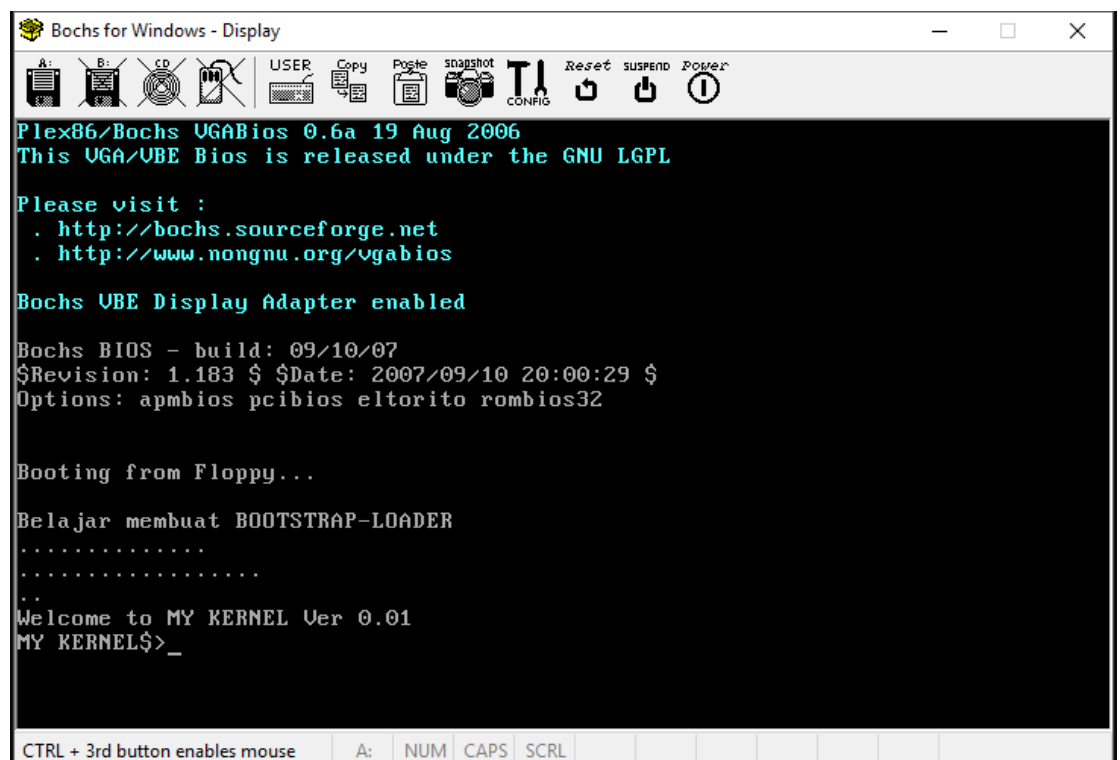
09/24/2018  01:12 PM    <DIR>          .
09/24/2018  01:12 PM    <DIR>          ..
09/24/2018  01:14 PM               10,153 bochs.log
12/15/2008  11:18 PM               1,625 bochsrc.bxrc
09/24/2018  01:11 PM               15,918 boot.asm
09/24/2018  01:12 PM                512 boot.bin
09/16/2007  11:22 PM              18,432 bximage.exe
02/27/2007  03:50 AM              342,016 dd.exe
12/15/2008  08:52 PM                78 dosfp.bat
09/24/2018  01:12 PM            1,474,560 floppya.img
09/19/2018  12:09 PM                7,966 kernel.asm
09/24/2018  01:14 PM                611 kernel.bin
12/15/2008  11:21 PM                228 Makefile
12/15/2008  07:20 PM                 44 s.bat
               12 File(s)            1,872,143 bytes
               2 Dir(s)  139,138,772,992 bytes free

```

12. Memindahkan file 'kernel.bin' ke dalam file image 'floppya.img'



13. Melakukan proses boot pada PC Simulator dengan menggunakan 'floppya.img' yang sudah diberi tambahan file 'kernel.bin'



14. Memodifikasi file 'kernel.asm'

```
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, 0x0D
    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
```

```
Bochs for Windows - Display
A: B: CD USER Copy Paste Snapshot CONFIG Reset SUSPEND Power
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...

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

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

Modul 3

Mengenal Cara 'Debugging' Program Bootstrap-loader

Nama : Anang Fahrudin Arbi

NIM : L200170106

Kelas : E

1. Start run

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

C:\OS\LAB\LAB3>cd C:\OS

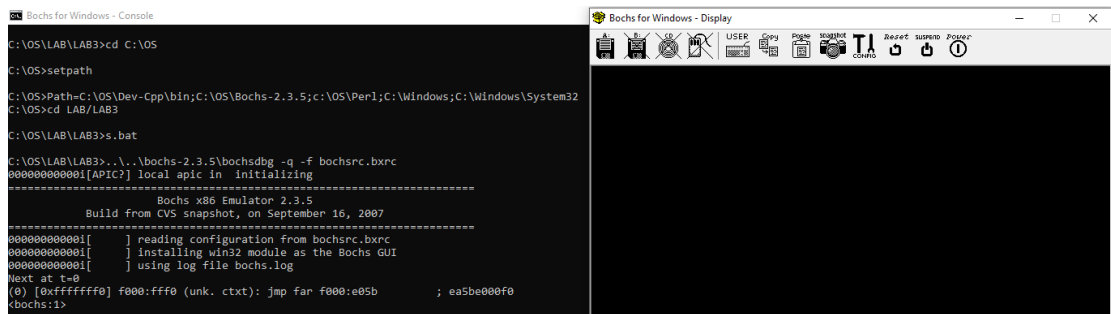
C:\OS>setpath

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/LAB3

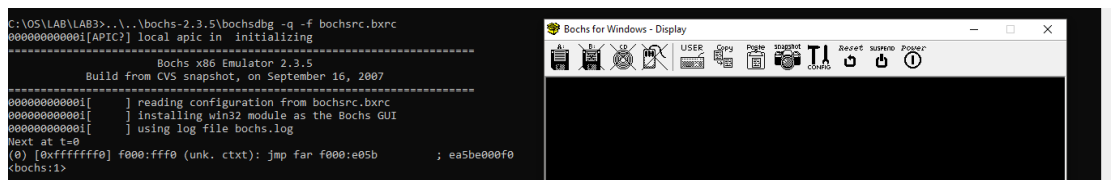
C:\OS\LAB\LAB3>
```

2. Proses debugging

```
C:\OS\LAB\LAB3>type s.bat
..\..\bochs-2.3.5\bochsdbg -q -f bochsrc.bxrc
```



3. Mulai melakukan debugging



4. Melihat isi register CS dan IP

```

<bochs:1> r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:00000f20 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000fff0
eflags 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:2>

```

5. Mengeksekusi perintah selanjutnya lalu melihat isi register CS dan IP

```

<bochs:1> r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:00000f20 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000fff0
eflags 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:2> s
Next at t=1
(0) [0x000fe05b] f000:e05b (unk. ctxt): xor ax, ax
<bochs:3> r
rax: 0x00000000:00000000 rcx: 0x00000000:00000000
rdx: 0x00000000:00000f20 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000e05b
eflags 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:4>

```

6. Cara mengetahui tahapan detail yang dilakukan PC

```

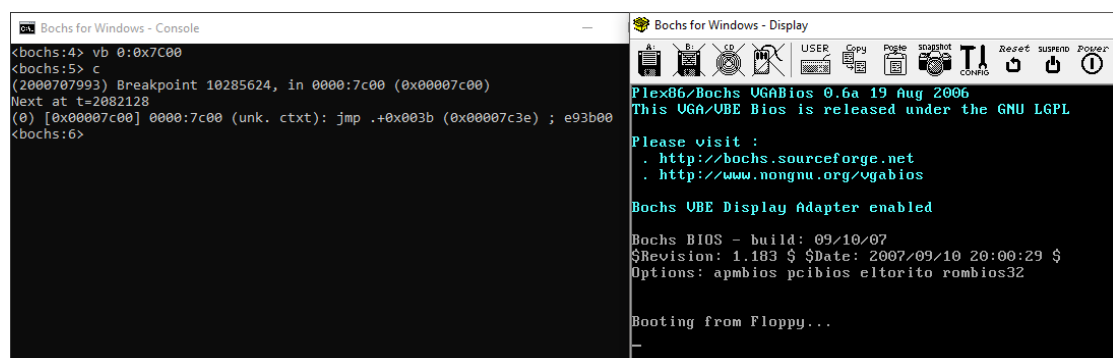
<bochs:6> s
Next at t=3
(0) [0x000fe05f] f000:e05f (unk. ctxt): out 0xda, al          ; e6da
<bochs:7> s
Next at t=4
(0) [0x000fe061] f000:e061 (unk. ctxt): mov al, 0xc0          ; b0c0
<bochs:8> s
Next at t=5
(0) [0x000fe063] f000:e063 (unk. ctxt): out 0xd6, al          ; e6d6
<bochs:9> s
Next at t=6
(0) [0x000fe065] f000:e065 (unk. ctxt): mov al, 0x00          ; b000
<bochs:10> s
Next at t=7
(0) [0x000fe067] f000:e067 (unk. ctxt): out 0xd4, al          ; e6d4
<bochs:11> s
Next at t=8
(0) [0x000fe069] f000:e069 (unk. ctxt): mov al, 0x0f          ; b00f
<bochs:12> s
Next at t=9
(0) [0x000fe06b] f000:e06b (unk. ctxt): out 0x70, al          ; e670
<bochs:13> r
rax: 0x00000000:0000000f rcx: 0x00000000:00000000
rdx: 0x00000000:00000f20 rbx: 0x00000000:00000000
rsp: 0x00000000:00000000 rbp: 0x00000000:00000000
rsi: 0x00000000:00000000 rdi: 0x00000000:00000000
r8 : 0x00000000:00000000 r9 : 0x00000000:00000000
r10: 0x00000000:00000000 r11: 0x00000000:00000000
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:0000e06b
eflags 0x00000046
IOPL=0 id vip vif ac vm rf nt of df if tf sf ZF af PF cf
<bochs:14>

```

7. Membuat break point pada alamat 0000:7C000

```
<bochs:4> vb 0:0x7C00
```

8. Melanjutkan program yang terdapat dalam BIOS untuk memeriksa RAM dan peralatan yang lainnya



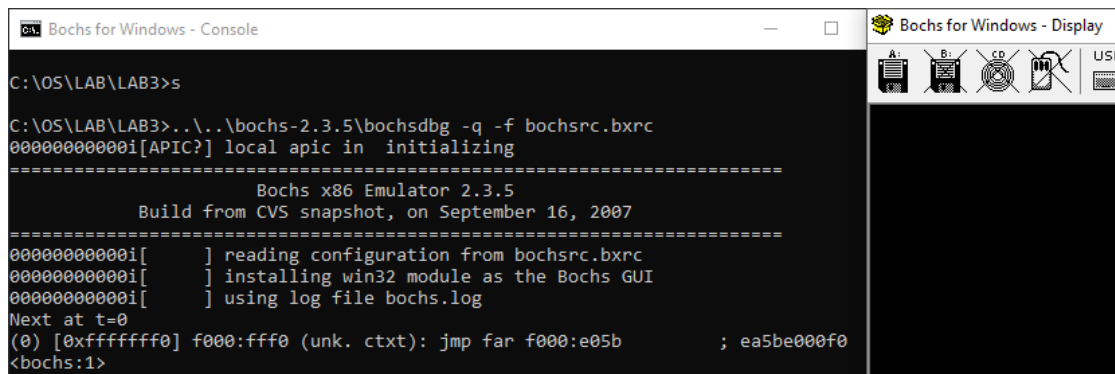
9. Menghentikan debugging

```
<bochs:8> q
# In bx_win32_gui_c::exit(void)!

Bochs is exiting. Press ENTER when you're ready to close this window.

C:\OS\LAB\LAB3>
```

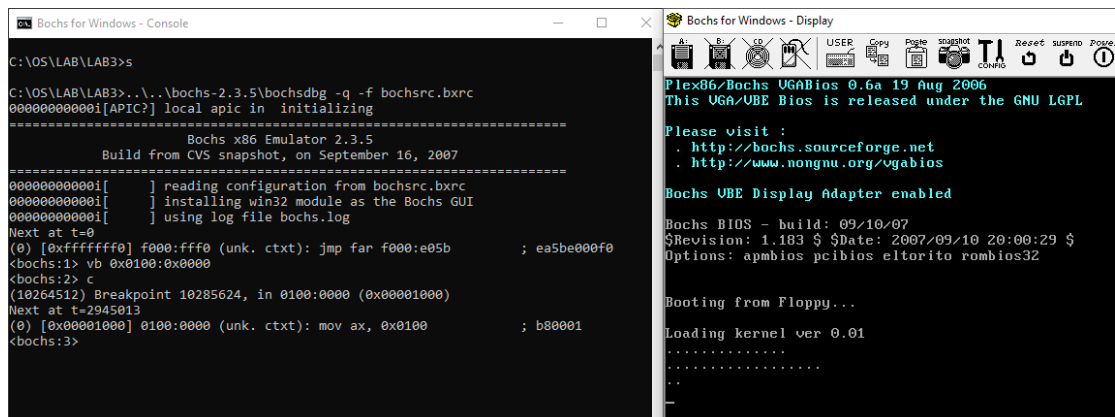
10. Menjalankan lagi



The screenshot shows two windows from the Bochs emulator. The 'Bochs for Windows - Console' window displays the command prompt where the user has entered 's' to start the emulator. The output shows the Bochs x86 Emulator 2.3.5 build from a CVS snapshot on September 16, 2007. It lists the actions: reading configuration from bochsrc.bxrc, installing the win32 module as the Bochs GUI, and using log file bochs.log. The next instruction is a jump far to f000:e05b. The 'Bochs for Windows - Display' window is currently blank.

```
Bochs for Windows - Console
C:\OS\LAB\LAB3>s
C:\OS\LAB\LAB3>..\..\bochs-2.3.5\bochsdbg -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
Next at t=0
(0) [0xffffffff] f000:fff0 (unk. ctxt): jmp far f000:e05b      ; ea5be00f0
<bochs:1>
```

11. Membuat break point di alamat 0x0100:0x0000



The screenshot shows the Bochs emulator with a breakpoint set at address 0x0100:0x0000. The console window shows the command 'b 0x0100:0x0000' and the output indicating the breakpoint is set at 10285624. The display window shows the BIOS boot screen for Flex86/Bochs UGABios 0.6a 19 Aug 2006, including version information and options.

```
Bochs for Windows - Console
C:\OS\LAB\LAB3>s
C:\OS\LAB\LAB3>..\..\bochs-2.3.5\bochsdbg -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
Next at t=0
(0) [0xffffffff] f000:fff0 (unk. ctxt): jmp far f000:e05b      ; ea5be00f0
<bochs:1> vb 0x0100:0x0000
<bochs:2> c
(10285624) Breakpoint 10285624, in 0100:0000 (0x00001000)
Next at t=2945013
(0) [0x00001000] 0100:0000 (unk. ctxt): mov ax, 0x0100      ; b80001
<bochs:3>
```

Bochs for Windows - Display

Flex86/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...

Loading kernel ver 0.01

.....

..

12. Meneruskan langkah PC Simulator sebanyak 10x

```

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
Next at t=0
(0) [0xffffffff] f000:fff0 (unk. ctxt): jmp far f000:e05b          ; ea5be000f0
<bochs:1> vb  0x0100:0x0000
<bochs:2> c
(10264512) Breakpoint 10285624, in 0100:0000 (0x00001000)
Next at t=2945013
(0) [0x00001000] 0100:0000 (unk. ctxt): mov ax, 0x0100              ; b80001
<bochs:3> s
Next at t=2945014
(0) [0x00001003] 0100:0003 (unk. ctxt): mov ds, ax                  ; 8ed8
<bochs:4> s
Next at t=2945015
(0) [0x00001005] 0100:0005 (unk. ctxt): mov es, ax                  ; 8ec0
<bochs:5> s
Next at t=2945016
(0) [0x00001007] 0100:0007 (unk. ctxt): cli                          ; fa
<bochs:6> s
Next at t=2945017
(0) [0x00001008] 0100:0008 (unk. ctxt): mov ss, ax                  ; 8ed0
<bochs:7> s
Next at t=2945018
(0) [0x0000100a] 0100:000a (unk. ctxt): mov sp, 0xffff              ; bcffff
<bochs:8> s
Next at t=2945019
(0) [0x0000100d] 0100:000d (unk. ctxt): sti                          ; fb
<bochs:9> s
Next at t=2945020
(0) [0x0000100e] 0100:000e (unk. ctxt): push dx                    ; 52
<bochs:10> s
Next at t=2945021
(0) [0x0000100f] 0100:000f (unk. ctxt): push es                     ; 06
<bochs:11> s
Next at t=2945022
(0) [0x00001010] 0100:0010 (unk. ctxt): xor ax, ax                  ; 31c0
<bochs:12>
Next at t=2945023
(0) [0x00001012] 0100:0012 (unk. ctxt): mov es, ax                  ; 8ec0
<bochs:13>

```

TUGAS:

1. Tabel Peta Memori Pada IBM PC

Blok Memori	AlokasiPemakaian
F 0 0 0 0	ROM BIOS, Diagnostic, BASIC
E 0 0 0 0	ROM program
D 0 0 0 0	ROM program
C 0 0 0 0	Perluasan BIOS untukhardisk XT
B 0 0 0 0	Monokrom Monitor
A 0 0 0 0	Monitor EGA, VGS, dll

9 0 0 0 0	Daerah kerjapemakai s/d 640 KB
8 0 0 0 0	Daerah kerjapemakai s/d 576 KB
7 0 0 0 0	Daerah kerjapemakai s/d 512 KB
6 0 0 0 0	Daerah kerjapemakai s/d 448 KB
5 0 0 0 0	Daerah kerjapemakai s/d 384 KB
4 0 0 0 0	Daerah kerjapemakai s/d 320 KB
3 0 0 0 0	Daerah kerjapemakai s/d 256 KB
2 0 0 0 0	Daerah kerjapemakai s/d 192 KB
1 0 0 0 0	Daerah kerjapemakai s/d 128 KB
0 0 0 0 0	Daerah kerjapemakai s/d 64 KB

2.

1. Real-Mode

Real-Mode adalah sebuah modus di mana prosesor Intel x86 berjalan seolah-olah dirinya adalah sebuah prosesor Intel 8085 atau Intel 8088, meski ia merupakan prosesor Intel 80286 atau lebih tinggi. Karenanya, modus ini juga disebut sebagai modus 8086 (8086 Mode). Dalam modus ini, prosesor hanya dapat mengeksekusi instruksi 16-bit saja dengan menggunakan register internal yang berukuran 16-bit, serta hanya dapat mengakses hanya 1024 KB dari memori karena hanya menggunakan 20-bit jalur bus alamat. Semua program DOS berjalan pada modus ini.

Prosesor yang dirilis setelah 8085, semacam Intel 80286 juga dapat menjalankan instruksi 16-bit, tapi jauh lebih cepat dibandingkan 8085. Dengan kata lain, Intel 80286 benar-benar kompatibel dengan prosesor Intel 8086 yang didesain sebelumnya. Sehingga prosesor Intel 80286 pun dapat menjalankan program-program 16-bit yang didesain untuk 8085 (IBM PC), dengan tentunya kecepatan yang jauh lebih tinggi.

Dalam Real-mode, tidak ada proteksi ruang alamat memori, sehingga tidak dapat melakukan multi-tasking. Inilah sebabnya, mengapa program-program DOS bersifat single-tasking. Jika dalam modus real terdapat multi-tasking, maka kemungkinan besar antara dua program yang sedang berjalan, terjadi tabrakan (crash) antara satu dengan lainnya.

2. Protected Mode

Modus terproteksi (protected mode) adalah sebuah modus di mana terdapat proteksi ruang alamat memori yang ditawarkan oleh mikroprosesor untuk digunakan oleh sistem operasi. Modus ini datang dengan mikroprosesor Intel 80286 atau yang lebih tinggi. Karena memiliki proteksi ruang alamat memori, maka dalam modus ini sistem operasi dapat melakukan multitasking.

Prosesor Intel 80286 memang dilengkapi kemampuan masuk ke dalam modus terproteksi, tapi tidak dapat keluar dari modus tersebut tanpa harus mengalami reset (warm boot atau cold boot). Kesalahan ini telah diperbaiki oleh Intel dengan merilis prosesor Intel 80386 yang dapat masuk ke dalam modus terproteksi dan keluar darinya tanpa harus melakukan reset. Inilah sebabnya mengapa Windows 95/Windows 98 dilengkapi dengan modus Restart in MS-DOS Mode, meski sebenarnya sistem operasi tersebut merupakan sistem operasi yang berjalan dalam modus terproteksi.

Modul 4

Pengolahan File dan Directiry Menggunakan MS-DOS / Command Prompt Windows

Nama : Anang Fahrudin Arbi

NIM : L200170106

Kelas : E

A. Percobaan Pertama : Melihar Versi MS-DOS

1. Melihat versi windows dalam Command Prompt

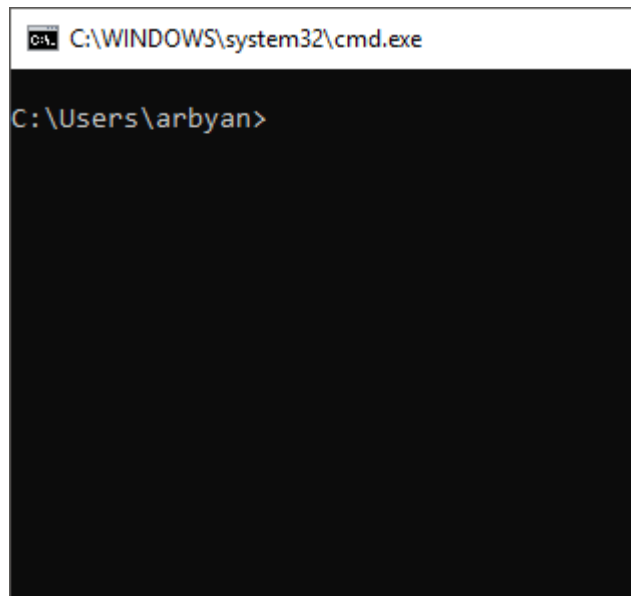
```
C:\Users\arbyan>ver  
  
Microsoft Windows [Version 10.0.16299.666]  
  
C:\Users\arbyan>
```

B. Percobaan Kedua : Melihat, Masuk, Keluar dari direktori dan keluar dari Command Prompt

1. Membersihkan tulisan pada layar

```
Microsoft Windows [Version 10.0.16299.666]  
(c) 2017 Microsoft Corporation. All rights reserved.  
  
C:\Users\arbyan>ver  
  
Microsoft Windows [Version 10.0.16299.666]  
  
C:\Users\arbyan>cls
```

*Kondisi sebelum dibersihkan



*Kondisi setelah dibersihkan

2. Melihat isi direktori didalam folder

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

C:\Users\arbyan>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-AB83

Directory of C:\Users\arbyan

09/27/2018  12:40 PM  <DIR>          .
09/27/2018  12:40 PM  <DIR>          ..
09/20/2018  02:37 PM  <DIR>          .eclipse
09/19/2017  10:08 AM  <DIR>          .gnome2
09/19/2017  10:09 AM             1,171  .gvrngrc
07/28/2018  08:02 AM  <DIR>          .idea
11/15/2017  08:02 AM  <DIR>          .idlerc
07/28/2018  07:42 AM  <DIR>          .javame-sdk
10/03/2018  01:34 PM  <DIR>          .p2
07/28/2018  08:07 AM  <DIR>          .PyCharmCE2017.2
10/17/2017  06:15 AM             218  .recently-used.xbel
05/15/2018  02:35 PM  <DIR>          .tooling
09/06/2017  01:31 PM  <DIR>          .vscode
09/20/2018  09:54 PM  <DIR>          3D Objects
03/07/2018  11:28 AM             11,444  Backup Of prt1.pdsbak
08/31/2018  06:14 PM  <DIR>          Creative Cloud Files
09/20/2018  09:54 PM  <DIR>          Desktop
09/02/2018  09:20 PM  <DIR>          Documents
09/02/2018  09:20 PM  <DIR>          Downloads
05/30/2018  05:03 PM  <DIR>          greenfoot
09/28/2017  12:40 PM  <DIR>          GvR
03/31/2018  08:55 PM             42  gvr_stderr.log
03/31/2018  08:55 PM            558  gvr_stdout.log
07/27/2018  06:09 AM  <DIR>          javame-sdk
09/27/2018  12:40 PM  <DIR>          java_project
09/02/2018  09:20 PM  <DIR>          Music
09/26/2018  01:56 PM  <DIR>          OneDrive
09/02/2018  09:20 PM  <DIR>          Pictures
10/29/2017  03:48 AM  <DIR>          Prezi
03/07/2018  12:00 PM             13,986  prt1.pdsprj
03/08/2018  02:23 PM             1,494  prt1.pdsprj.DESKTOP-FJCSR7H.arbyan.workspace
09/02/2018  09:20 PM  <DIR>          Videos
05/15/2018  02:39 PM  <DIR>          workspace
              7 File(s)          28,913 bytes
              27 Dir(s) 128,160,989,184 bytes free

C:\Users\arbyan>
```

3. Keluar dari folder User menuju drive C

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

C:\Users\arbyan>cd ..\..

C:\>
```

4. Melihat direktori C, dan masuk ke folder 'Windows'

```

C:\>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\

09/02/2018  09:02 PM    <DIR>          AMD
09/06/2017  07:40 PM    <DIR>          drivers
09/16/2018  08:55 AM             0 dummy.wav
09/02/2018  09:57 AM    <DIR>          Fraps
09/16/2018  05:38 AM    <DIR>          OS
09/03/2018  11:18 AM    <DIR>          PerfLogs
09/19/2018  08:45 PM    <DIR>          praktikum
10/05/2018  05:36 AM    <DIR>          Program Files
10/05/2018  05:47 AM    <DIR>          Program Files (x86)
07/28/2018  08:13 AM    <DIR>          Python27
11/20/2017  07:34 PM    <DIR>          Python34
03/01/2018  11:27 AM    <DIR>          shadersmod.net
09/02/2018  09:19 PM    <DIR>          Users
03/27/2018  06:50 AM    <DIR>          Valve
10/05/2018  08:19 AM    <DIR>          Windows
10/05/2018  05:15 AM    <DIR>          Windows.old
08/25/2018  06:15 AM    <DIR>          Windows10Upgrade
09/12/2017  09:47 PM    <DIR>          xampp
               1 File(s)              0 bytes
              17 Dir(s) 128,161,067,008 bytes free

C:\>cd windows

C:\Windows>

```

5. Menampilkan nama file perhalaman

```

Directory of C:\Windows

10/05/2018  08:19 AM    <DIR>          .
10/05/2018  08:19 AM    <DIR>          ..
09/03/2018  11:18 AM    <DIR>          addins
09/03/2018  11:46 AM    <DIR>          AMDTAs
09/10/2018  04:21 PM    <DIR>          appcompat
09/20/2018  09:47 PM    <DIR>          apppatch
10/03/2018  07:03 PM    <DIR>          AppReadiness
09/03/2018  11:42 AM    <DIR>          bcastdvr
09/29/2017  08:41 PM             65,536 bfsvc.exe
09/03/2018  11:18 AM    <DIR>          Boot
09/03/2018  11:18 AM    <DIR>          Branding
09/26/2018  01:41 PM    <DIR>          CbsTemp
10/04/2018  10:48 PM             1,586 comsetup.log
09/03/2018  11:42 AM    <DIR>          containers
09/03/2018  11:54 AM    <DIR>          CSC
09/03/2018  11:18 AM    <DIR>          Cursors
10/05/2018  08:19 AM             2,226 DDACLSys.log
09/25/2018  08:45 AM    <DIR>          debug
10/03/2018  08:10 PM    <DIR>          DeliveryOptimization
10/05/2018  08:17 AM             17,148 diagerr.xml
09/03/2018  11:18 AM    <DIR>          diagnostics
10/05/2018  08:17 AM             17,148 diagwrn.xml
09/03/2018  11:29 AM    <DIR>          DigitalLocker
10/04/2018  10:56 PM              712 DtcInstall.log
09/03/2018  11:29 AM    <DIR>          en-US
08/09/2018  12:50 PM             3,904,304 explorer.exe
09/03/2018  11:18 AM    <DIR>          GameBarPresenceWriter
09/03/2018  11:18 AM    <DIR>          Globalization
09/03/2018  11:29 AM    <DIR>          Help
04/16/2018  03:04 AM             976,896 HelpPane.exe
09/29/2017  08:41 PM             17,920 hh.exe
09/03/2018  11:29 AM    <DIR>          IME
09/20/2018  09:47 PM    <DIR>          ImmersiveControlPanel
10/04/2018  10:45 PM    <DIR>          INF
09/03/2018  11:55 AM    <DIR>          InfusedApps
09/03/2018  11:18 AM    <DIR>          InputMethod
09/03/2018  11:18 AM    <DIR>          L2Schemas
09/27/2018  05:45 AM    <DIR>          LiveKernelReports
10/03/2018  06:06 PM    <DIR>          Logs
09/29/2017  08:42 PM             43,131 mib.bin
Press any key to continue . . .

```

*Halaman pertama

C:\WINDOWS\system32\cmd.exe - dir /p

```
10/05/2018 06:17 AM <DIR> Microsoft.NET
09/03/2018 11:18 AM <DIR> Migration
09/03/2018 11:18 AM <DIR> ModemLogs
09/29/2017 08:41 PM 246,784 notepad.exe
09/03/2018 11:33 AM <DIR> OCR
09/03/2018 11:18 AM <DIR> Offline Web Pages
10/05/2018 06:17 PM <DIR> Panther
10/05/2018 05:34 AM <DIR> PCHEALTH
09/03/2018 11:18 AM <DIR> Performance
09/28/2018 03:16 PM 979,882 PFR0.log
09/03/2018 11:18 AM <DIR> PLA
09/03/2018 06:05 PM <DIR> PolicyDefinitions
10/05/2018 06:17 PM <DIR> prefetch
09/20/2018 09:47 PM <DIR> PrintDialog
09/03/2018 11:42 AM <DIR> Provisioning
09/29/2017 08:41 PM 335,872 regedit.exe
10/04/2018 10:46 PM <DIR> Registration
09/03/2018 11:18 AM <DIR> RemotePackages
09/23/2018 05:26 AM <DIR> rescache
09/03/2018 11:18 AM <DIR> Resources
09/03/2018 11:18 AM <DIR> SchCache
09/03/2018 11:18 AM <DIR> schemas
09/03/2018 11:18 AM <DIR> security
09/02/2018 08:58 PM <DIR> ServiceProfiles
09/03/2018 11:42 AM <DIR> servicing
09/03/2018 11:44 AM <DIR> Setup
10/05/2018 08:17 AM 9,580 setupact.log
09/29/2018 08:44 AM 0 setuperr.log
09/20/2018 09:47 PM <DIR> ShellExperiences
10/05/2018 05:36 AM <DIR> SHELLNEW
09/03/2018 11:18 AM <DIR> SKB
09/27/2018 05:56 AM <DIR> SoftwareDistribution
09/03/2018 11:18 AM <DIR> Speech
09/03/2018 11:18 AM <DIR> Speech_OneCore
09/29/2017 08:42 PM 130,560 splwow64.exe
09/03/2018 11:18 AM <DIR> System
09/03/2018 11:10 AM 219 system.ini
10/05/2018 05:36 AM <DIR> System32
09/03/2018 11:18 AM <DIR> SystemApps
09/03/2018 11:18 AM <DIR> SystemResources
10/03/2018 06:17 PM <DIR> SysWOW64
09/03/2018 11:18 AM <DIR> TAPI
10/05/2018 05:27 AM <DIR> Tasks
10/05/2018 06:18 PM <DIR> Temp
09/20/2018 09:47 PM <DIR> TextInput
Press any key to continue . . .
```

*hal kedua


```

Press any key to continue . . .
09/03/2018  11:18 AM    <DIR>          tracing
09/02/2018  09:01 PM    <DIR>          twain_32
09/29/2017  08:42 PM             65,536 twain_32.dll
09/20/2018  07:56 PM    <DIR>          UpdateAssistant
09/03/2018  11:18 AM    <DIR>          Vss
09/03/2018  11:18 AM    <DIR>          Web
10/05/2018  05:55 AM             167 win.ini
09/29/2017  08:41 PM             670 WindowsShell.Manifest
10/02/2018  09:39 PM             276 WindowsUpdate.log
09/29/2017  08:42 PM             11,776 winhlp32.exe
09/26/2018  03:46 PM    <DIR>          WinSxS
09/29/2017  08:41 PM             316,640 WMSysPr9.prx
09/29/2017  08:41 PM             11,264 write.exe
          24 File(s)          7,155,833 bytes
          74 Dir(s)  128,160,890,880 bytes free

C:\Windows>

```

*hal terakhir

- Menampilkan isi file dengan bentuk mendatar dan menampilkan file yang terhidir

```

C:\Windows>dir /w
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\Windows

[.]                [...]                [addins]                [AMDTAs]                [appcompat]                [apppatch]                [AppRe
[bcasdvr]          bfsvc.exe          [Boot]                [Branding]                [CbsTemp]                comsetup.log                [conta
[CSC]              [Cursors]          DDACL.sys.log          [debug]                [DeliveryOptimization]    diagerr.xml                [diagn
diagwrrn.xml       [DigitalLocker]    DtcInstall.log         [en-US]                explorer.exe               [GameBarPresenceWriter]    [Globa
[Help]             HelpPane.exe       hh.exe                 [IME]                  [ImmersiveControlPanel]  [INF]                      [Infus
[InputMethod]      [L2Schemas]       [LiveKernelReports]   [Logs]                  mib.bin                   [Microsoft.NET]           [Migra
[ModemLogs]        notepad.exe        [OCR]                  [Offline Web Pages]     [Panther]                [PCHEALTH]                [Perfo
PFRO.log           [PLA]              [PolicyDefinitions]   [Prefetch]              [PrintDialog]             [Provisioning]             regedi
[Registration]     [RemotePackages]   [rescache]             [Resources]              [SchCache]                [schemas]                  [secur
[ServiceProfiles] [servicing]         [Setup]                setupect.log             setuperr.log               [ShellExperiences]        [SHELL
[SKB]              [SoftwareDistribution] [Speech]              [Speech_OneCore]        splwow64.exe              [System]                   system
[System32]          [SystemApps]       [SystemResources]     [SysWow64]              twain_32.dll               [TAPI]                     [Temp]
[TextInput]         [tracing]          [twain_32]            twain_32.dll             [UpdateAssistant]         [Vss]                      [Web]
win.ini            WindowsShell.Manifest WindowsUpdate.log       winhlp32.exe              [WinSxS]                  WMSysPr9.prx              write.

          24 File(s)          7,155,833 bytes
          74 Dir(s)  128,160,890,880 bytes free

```

*perintah "dir /w"

```

C:\WINDOWS\system32\cmd.exe
C:\Windows>dir /a
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\Windows

10/05/2018  08:19 AM    <DIR>          .
10/05/2018  08:19 AM    <DIR>          ..
09/03/2018  11:18 AM    <DIR>          addins
09/03/2018  11:46 AM    <DIR>          AMDTAs
09/10/2018  04:21 PM    <DIR>          appcompat
09/20/2018  09:47 PM    <DIR>          apppatch
10/03/2018  07:03 PM    <DIR>          AppReadiness
10/05/2018  06:07 AM    <DIR>          assembly
09/03/2018  11:42 AM    <DIR>          bcastdvr
09/29/2017  08:41 PM             65,536 bfsvc.exe
09/03/2018  11:18 AM    <DIR>          BitLockerDiscoveryVolumeContents
09/03/2018  11:18 AM    <DIR>          Boot
10/05/2018  06:11 PM             67,584 bootstat.dat
09/03/2018  11:18 AM    <DIR>          Branding
09/26/2018  01:41 PM    <DIR>          CbsTemp
10/04/2018  10:48 PM             1,586 comsetup.log
09/03/2018  11:42 AM    <DIR>          containers
09/03/2018  11:54 AM    <DIR>          CSC
09/03/2018  11:18 AM    <DIR>          Cursors
10/05/2018  08:19 AM             2,226 DDACLSys.log
09/25/2018  08:45 AM    <DIR>          debug
10/03/2018  08:10 PM    <DIR>          DeliveryOptimization
10/05/2018  08:17 AM             17,148 diagerr.xml
09/03/2018  11:18 AM    <DIR>          diagnostics
10/05/2018  08:17 AM             17,148 diagwrn.xml
09/03/2018  11:29 AM    <DIR>          DigitalLocker
09/03/2018  11:18 AM    <DIR>          Downloaded Program Files
10/04/2018  10:56 PM             712 DtcInstall.log
09/03/2018  11:18 AM    <DIR>          ELAMBKUP
09/03/2018  11:29 AM    <DIR>          en-US
08/09/2018  12:50 PM             3,904,304 explorer.exe
10/05/2018  05:36 AM    <DIR>          Fonts
09/03/2018  11:18 AM    <DIR>          GameBarPresenceWriter
09/03/2018  11:18 AM    <DIR>          Globalization
09/03/2018  11:29 AM    <DIR>          Help
04/16/2018  03:04 AM             976,896 HelpPane.exe
09/29/2017  08:41 PM             17,920 hh.exe
09/03/2018  11:29 AM    <DIR>          IME
09/20/2018  09:47 PM    <DIR>          ImmersiveControlPanel
10/04/2018  10:45 PM    <DIR>          INF

```

*Perintah dir /a

7. Keluar dari prompt dengan perintah “exit”

C. Percobaan ketiga : merubah nama file

1. Menuju folder baru “files” yang telah ditambahkan file “file1.docx” dan melihat isinya

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

C:\>cd files

C:\files>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files

10/05/2018  06:42 PM    <DIR>          .
10/05/2018  06:42 PM    <DIR>          ..
10/05/2018  06:42 PM                0 file1.docx
               1 File(s)                0 bytes
               2 Dir(s)  128,176,349,184 bytes free

C:\files>
```

2. Mengubah nama file

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

C:\>cd files

C:\files>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files

10/05/2018  06:42 PM    <DIR>          .
10/05/2018  06:42 PM    <DIR>          ..
10/05/2018  06:42 PM                0 file1.docx
               1 File(s)                0 bytes
               2 Dir(s)  128,176,349,184 bytes free

C:\files>ren file1.docx file.docx

C:\files>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files

10/05/2018  06:46 PM    <DIR>          .
10/05/2018  06:46 PM    <DIR>          ..
10/05/2018  06:42 PM                0 file.docx
               1 File(s)                0 bytes
               2 Dir(s)  128,176,332,800 bytes free

C:\files>
```

D. Percobaan keempat : copy file dan menghapus file

1. Membuat folder baru "files2"

C:\WINDOWS\system32\cmd.exe

```
C:\>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\

09/02/2018  09:02 PM    <DIR>          AMD
09/06/2017  07:40 PM    <DIR>          drivers
09/16/2018  08:55 AM             0 dummy.wav
10/05/2018  06:46 PM    <DIR>          files
10/05/2018  06:49 PM    <DIR>          files2
09/02/2018  09:57 AM    <DIR>          Fraps
09/16/2018  05:38 AM    <DIR>          OS
09/03/2018  11:18 AM    <DIR>          PerfLogs
09/19/2018  08:45 PM    <DIR>          praktikum
10/05/2018  05:36 AM    <DIR>          Program Files
10/05/2018  05:47 AM    <DIR>          Program Files (x86)
07/28/2018  08:13 AM    <DIR>          Python27
11/20/2017  07:34 PM    <DIR>          Python34
03/01/2018  11:27 AM    <DIR>          shadersmod.net
09/02/2018  09:19 PM    <DIR>          Users
03/27/2018  06:50 AM    <DIR>          Valve
10/05/2018  08:19 AM    <DIR>          Windows
10/05/2018  05:15 AM    <DIR>          Windows.old
08/25/2018  06:15 AM    <DIR>          Windows10Upgrade
09/12/2017  09:47 PM    <DIR>          xampp
               1 File(s)              0 bytes
               19 Dir(s)  128,176,267,264 bytes free

C:\>cd files

C:\files>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files

10/05/2018  06:46 PM    <DIR>          .
10/05/2018  06:46 PM    <DIR>          ..
10/05/2018  06:42 PM             0 file.docx
               1 File(s)              0 bytes
               2 Dir(s)  128,176,672,768 bytes free

C:\files>
```

2. Mencopy file yang ada didalam folder "files" menuju folder "files2"

C:\WINDOWS\system32\cmd.exe

```
C:\files2>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files2

10/05/2018  07:07 PM    <DIR>          .
10/05/2018  07:07 PM    <DIR>          ..
               0 File(s)                0 bytes
               2 Dir(s)  128,273,842,176 bytes free

C:\files2>copy C:\files C:\files2
C:\files\file.docx
               1 file(s) copied.

C:\files2>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files2

10/05/2018  07:09 PM    <DIR>          .
10/05/2018  07:09 PM    <DIR>          ..
10/05/2018  06:42 PM                0 file.docx
               1 File(s)                0 bytes
               2 Dir(s)  128,273,842,176 bytes free

C:\files2>
```

3. Mendelet isi folder "files"

C:\WINDOWS\system32\cmd.exe

```
C:\files>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files

10/05/2018  06:46 PM    <DIR>          .
10/05/2018  06:46 PM    <DIR>          ..
10/05/2018  06:42 PM                0 file.docx
                1 File(s)                0 bytes
                2 Dir(s)  128,273,514,496 bytes free

C:\files>cd..

C:\>del files
C:\files\*, Are you sure (Y/N)? y

C:\>cd files

C:\files>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files

10/05/2018  07:11 PM    <DIR>          .
10/05/2018  07:11 PM    <DIR>          ..
                0 File(s)                0 bytes
                2 Dir(s)  128,273,514,496 bytes free

C:\files>
```

4. Mengcopy isi file kemudian membuat folder baru dan meletakkan isi copyan didalamnya

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

C:\>xcopy files2 D:\baru\ /s/e
files2\file.docx
1 File(s) copied

C:\>D:

D:\>cd baru

D:\baru>dir
Volume in drive D has no label.
Volume Serial Number is 5A86-8CE4

Directory of D:\baru

10/05/2018  07:19 PM    <DIR>          .
10/05/2018  07:19 PM    <DIR>          ..
10/05/2018  06:42 PM                0 file.docx
                1 File(s)                0 bytes
                2 Dir(s)  103,799,267,328 bytes free

D:\baru>
```

- E. Percobaan kelima : membuat dan menghapus direktori
1. Membuat folder baru

C:\WINDOWS\system32\cmd.exe

```
C:\>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\

09/02/2018  09:02 PM    <DIR>        AMD
09/06/2017  07:40 PM    <DIR>        drivers
09/16/2018  08:55 AM             0 dummy.wav
10/05/2018  07:11 PM    <DIR>        files
10/05/2018  07:09 PM    <DIR>        files2
09/02/2018  09:57 AM    <DIR>        Fraps
09/16/2018  05:38 AM    <DIR>        OS
09/03/2018  11:18 AM    <DIR>        PerfLogs
09/19/2018  08:45 PM    <DIR>        praktikum
10/05/2018  05:36 AM    <DIR>        Program Files
10/05/2018  05:47 AM    <DIR>        Program Files (x86)
07/28/2018  08:13 AM    <DIR>        Python27
11/20/2017  07:34 PM    <DIR>        Python34
03/01/2018  11:27 AM    <DIR>        shadersmod.net
09/02/2018  09:19 PM    <DIR>        Users
03/27/2018  06:50 AM    <DIR>        Valve
10/05/2018  08:19 AM    <DIR>        Windows
10/05/2018  05:15 AM    <DIR>        Windows.old
08/25/2018  06:15 AM    <DIR>        Windows10Upgrade
09/12/2017  09:47 PM    <DIR>        xampp
               1 File(s)             0 bytes
               19 Dir(s)  128,273,223,680 bytes free

C:\>md baru

C:\>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\

09/02/2018  09:02 PM    <DIR>        AMD
10/05/2018  07:22 PM    <DIR>        baru
09/06/2017  07:40 PM    <DIR>        drivers
09/16/2018  08:55 AM             0 dummy.wav
10/05/2018  07:11 PM    <DIR>        files
10/05/2018  07:09 PM    <DIR>        files2
09/02/2018  09:57 AM    <DIR>        Fraps
09/16/2018  05:38 AM    <DIR>        OS
```

2. Menghapus direktori baru


```

C:\>rd baru

C:\>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\

09/02/2018  09:02 PM    <DIR>        AMD
09/06/2017  07:40 PM    <DIR>        drivers
09/16/2018  08:55 AM             0 dummy.wav
10/05/2018  07:11 PM    <DIR>        files
10/05/2018  07:09 PM    <DIR>        files2
09/02/2018  09:57 AM    <DIR>        Fraps
09/16/2018  05:38 AM    <DIR>        OS
09/03/2018  11:18 AM    <DIR>        PerfLogs
09/19/2018  08:45 PM    <DIR>        praktikum
10/05/2018  05:36 AM    <DIR>        Program Files
10/05/2018  05:47 AM    <DIR>        Program Files (x86)
07/28/2018  08:13 AM    <DIR>        Python27
11/20/2017  07:34 PM    <DIR>        Python34
03/01/2018  11:27 AM    <DIR>        shadersmod.net
09/02/2018  09:19 PM    <DIR>        Users
03/27/2018  06:50 AM    <DIR>        Valve
10/05/2018  08:19 AM    <DIR>        Windows
10/05/2018  05:15 AM    <DIR>        Windows.old
08/25/2018  06:15 AM    <DIR>        Windows10Upgrade
09/12/2017  09:47 PM    <DIR>        xampp
               1 File(s)             0 bytes
              19 Dir(s) 128,273,219,584 bytes free

C:\>

```

3. Membuat direktori baru dengan perintah "*mkdir*"

C:\WINDOWS\system32\cmd.exe

```
C:\>mkdir baru1
```

```
C:\>dir
```

```
Volume in drive C has no label.  
Volume Serial Number is C6A2-ABB3
```

```
Directory of C:\
```

09/02/2018	09:02 PM	<DIR>	AMD
10/05/2018	07:26 PM	<DIR>	baru1
09/06/2017	07:40 PM	<DIR>	drivers
09/16/2018	08:55 AM		0 dummy.wav
10/05/2018	07:11 PM	<DIR>	files
10/05/2018	07:09 PM	<DIR>	files2
09/02/2018	09:57 AM	<DIR>	Fraps
09/16/2018	05:38 AM	<DIR>	OS
09/03/2018	11:18 AM	<DIR>	PerfLogs
09/19/2018	08:45 PM	<DIR>	praktikum
10/05/2018	05:36 AM	<DIR>	Program Files
10/05/2018	05:47 AM	<DIR>	Program Files (x86)
07/28/2018	08:13 AM	<DIR>	Python27
11/20/2017	07:34 PM	<DIR>	Python34
03/01/2018	11:27 AM	<DIR>	shadersmod.net
09/02/2018	09:19 PM	<DIR>	Users
03/27/2018	06:50 AM	<DIR>	Valve
10/05/2018	08:19 AM	<DIR>	Windows
10/05/2018	05:15 AM	<DIR>	Windows.old
08/25/2018	06:15 AM	<DIR>	Windows10Upgrade
09/12/2017	09:47 PM	<DIR>	xampp
		1 File(s)	0 bytes
		20 Dir(s)	128,273,219,584 bytes free

```
C:\>
```

4. Membuat folder bernama "film" didalam folder "file1"

C:\WINDOWS\system32\cmd.exe

```
C:\>md files\film
```

```
C:\>cd files
```

```
C:\files>dir
```

```
Volume in drive C has no label.  
Volume Serial Number is C6A2-ABB3
```


```
Directory of C:\files
```

10/05/2018	07:32 PM	<DIR>	.
10/05/2018	07:32 PM	<DIR>	..
10/05/2018	07:32 PM	<DIR>	film
		0 File(s)	0 bytes
		3 Dir(s)	128,272,379,904 bytes free

```
C:\files>
```

F. Percobaan keenam : memindahkan file dan menampilkan isi folder secara terstruktur

1. Memindah file dari folder ke folder yang lain

 Select C:\WINDOWS\system32\cmd.exe

```
C:\>move C:\files\baru\pindah.docx C:\files2
1 file(s) moved.

C:\>cd files2

C:\files2>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files2

10/05/2018  07:37 PM    <DIR>          .
10/05/2018  07:37 PM    <DIR>          ..
10/05/2018  07:35 PM                0 pindah.docx
                1 File(s)                0 bytes
                2 Dir(s)  128,272,367,616 bytes free

C:\files2>move C:\files\baru\pindah.txt C:\files2
1 file(s) moved.


C:\files2>dir
Volume in drive C has no label.
Volume Serial Number is C6A2-ABB3

Directory of C:\files2

10/05/2018  07:38 PM    <DIR>          .
10/05/2018  07:38 PM    <DIR>          ..
10/05/2018  07:35 PM                0 pindah.docx
10/05/2018  07:36 PM                0 pindah.txt
                2 File(s)                0 bytes
                2 Dir(s)  128,272,367,616 bytes free

C:\files2>
```

2. Melihat seluruh isi folder secara terstruktur

 C:\WINDOWS\system32\cmd.exe

```
C:\files>tree
Folder PATH listing
Volume serial number is C6A2-ABB3
C:.
├── baru
└── film

C:\files>
```

TUGAS:

C:\WINDOWS\system32\cmd.exe

```
D:\Musik\Japanese>cd..\..

D:\>copy D:\musik1\alone.mp3 D:\multimedia
        1 file(s) copied.

D:\>copy D:\musik1\Alan Walker - Alone.mp3 D:\multimedia
The system cannot find the file specified.

D:\>copy D:\Project\1.jpg D:\multimedia
        1 file(s) copied.

D:\>copy D:\Rapat HW.txt D:\multimedia
The system cannot find the file specified.

D:\>copy D:\Rapat HW.txt D:\multimedia
The system cannot find the file specified.

D:\>copy D:\teks.txt D:\multimedia
        1 file(s) copied.

D:\>copy D:\Lampiran.docx D:\multimedia
        1 file(s) copied.

D:\>cd multimedia

D:\multimedia>dir
Volume in drive D has no label.
Volume Serial Number is 5A86-8CE4

Directory of D:\multimedia

10/05/2018  08:04 PM    <DIR>          .
10/05/2018  08:04 PM    <DIR>          ..
08/13/2018  09:32 PM             137,946 1.jpg
08/17/2017  04:11 PM          2,632,328 Alone.mp3
05/24/2018  09:48 PM          2,680,985 Lampiran.docx
05/17/2018  12:42 PM              1,113 teks.txt
               4 File(s)          5,452,372 bytes
               2 Dir(s)  103,790,481,408 bytes free

D:\multimedia>
```

Modul 6

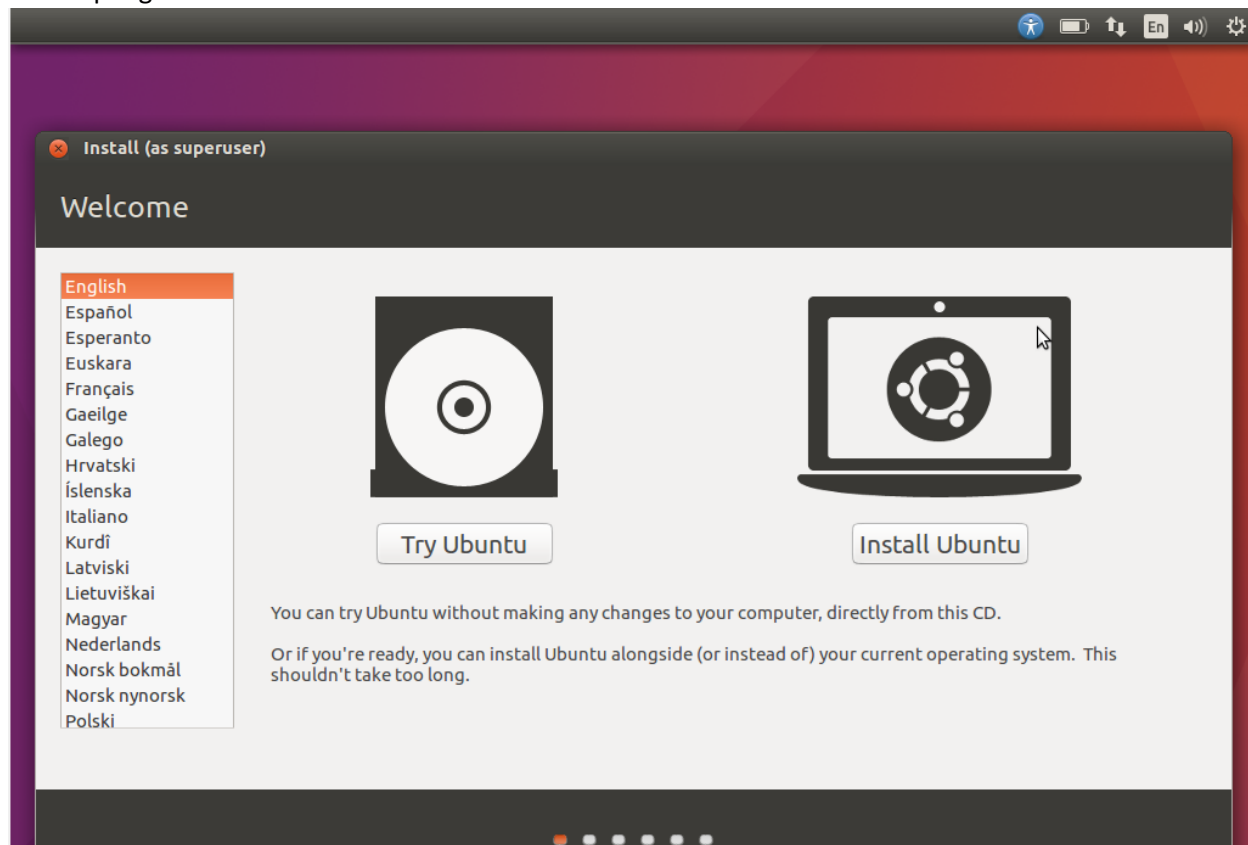
Instalasi Sistem Operasi Linux, dan Menambah Aplikasi Linux

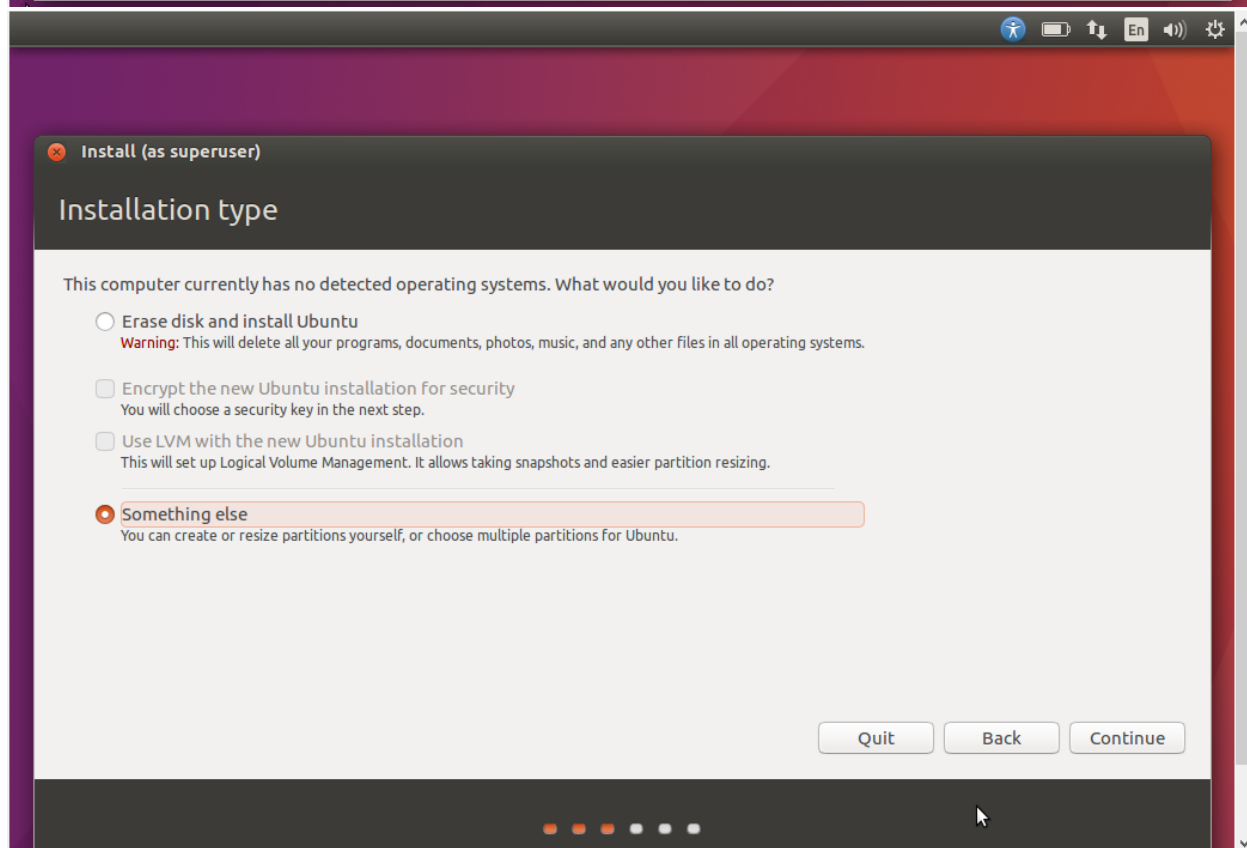
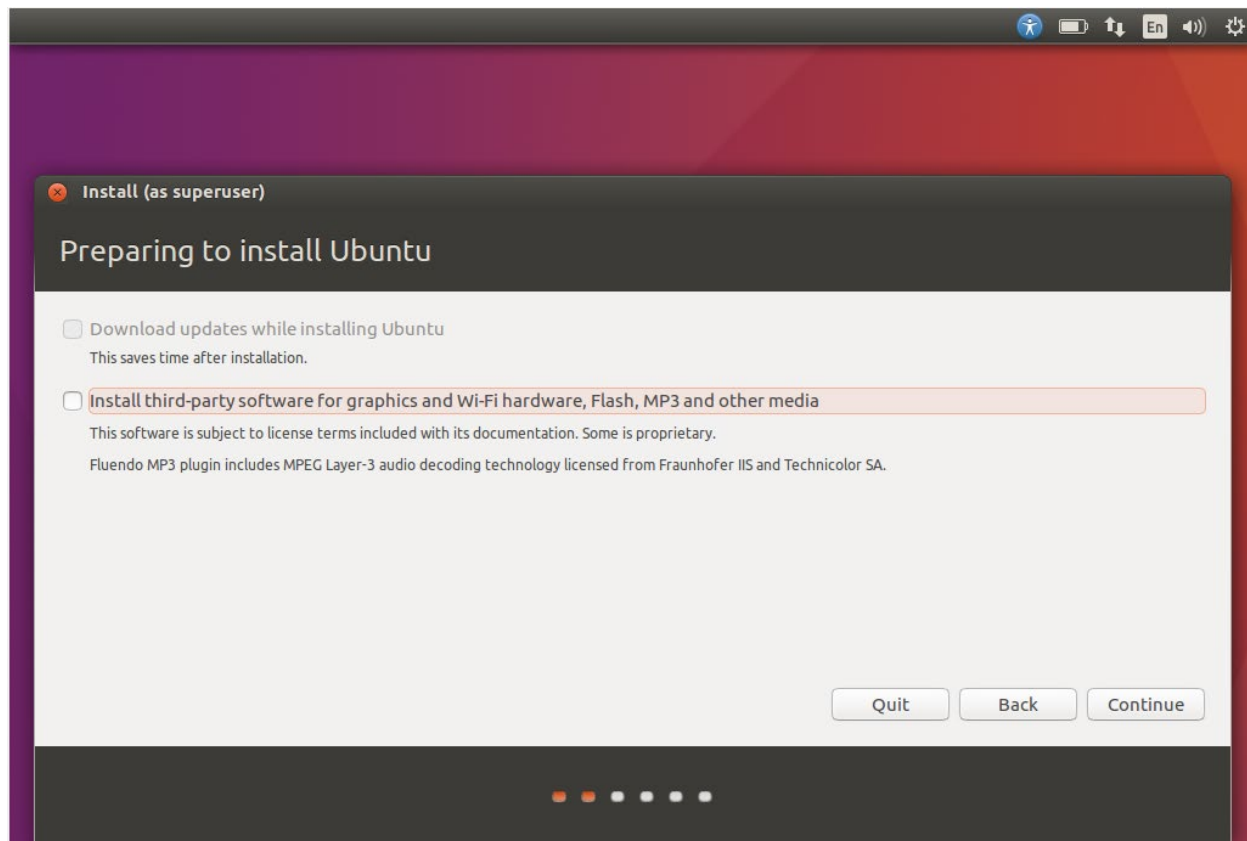
Nama : Anang Fahrudin Arbi

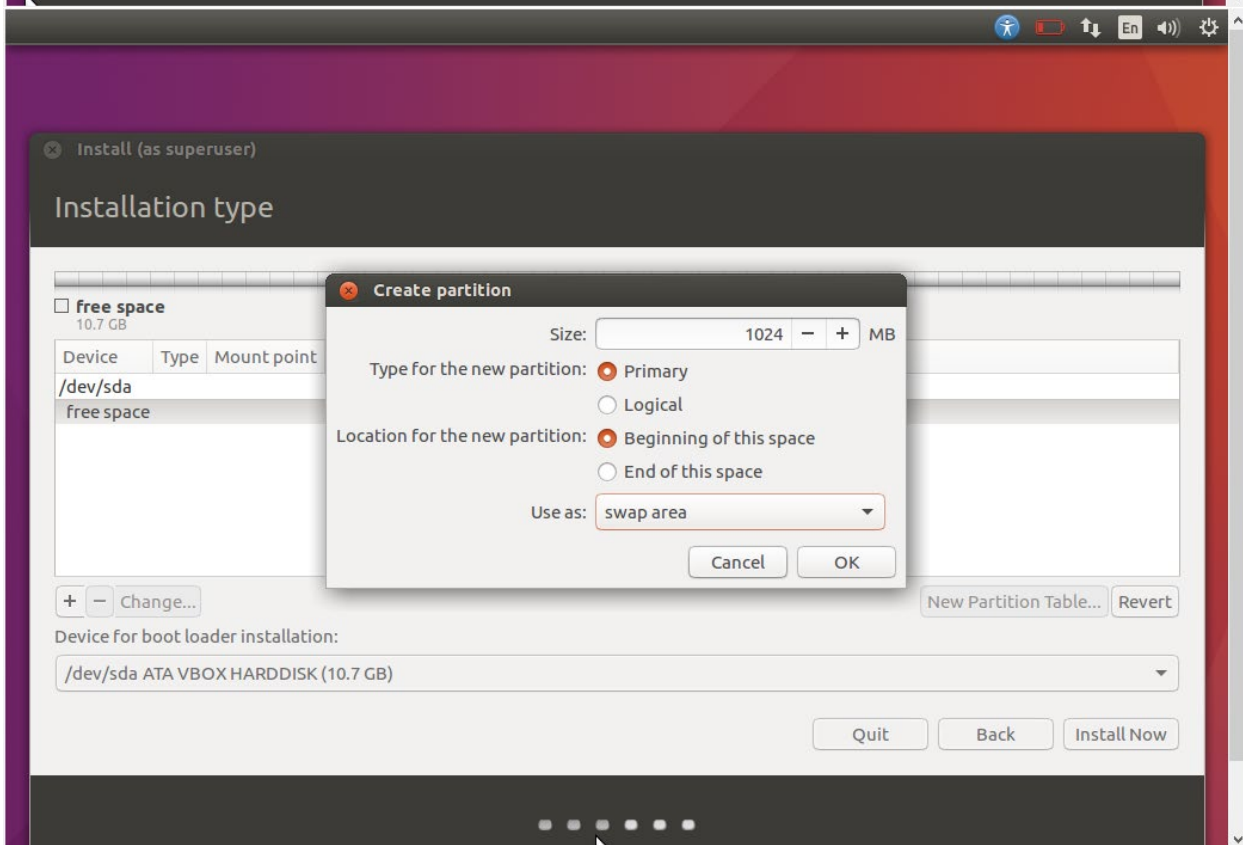
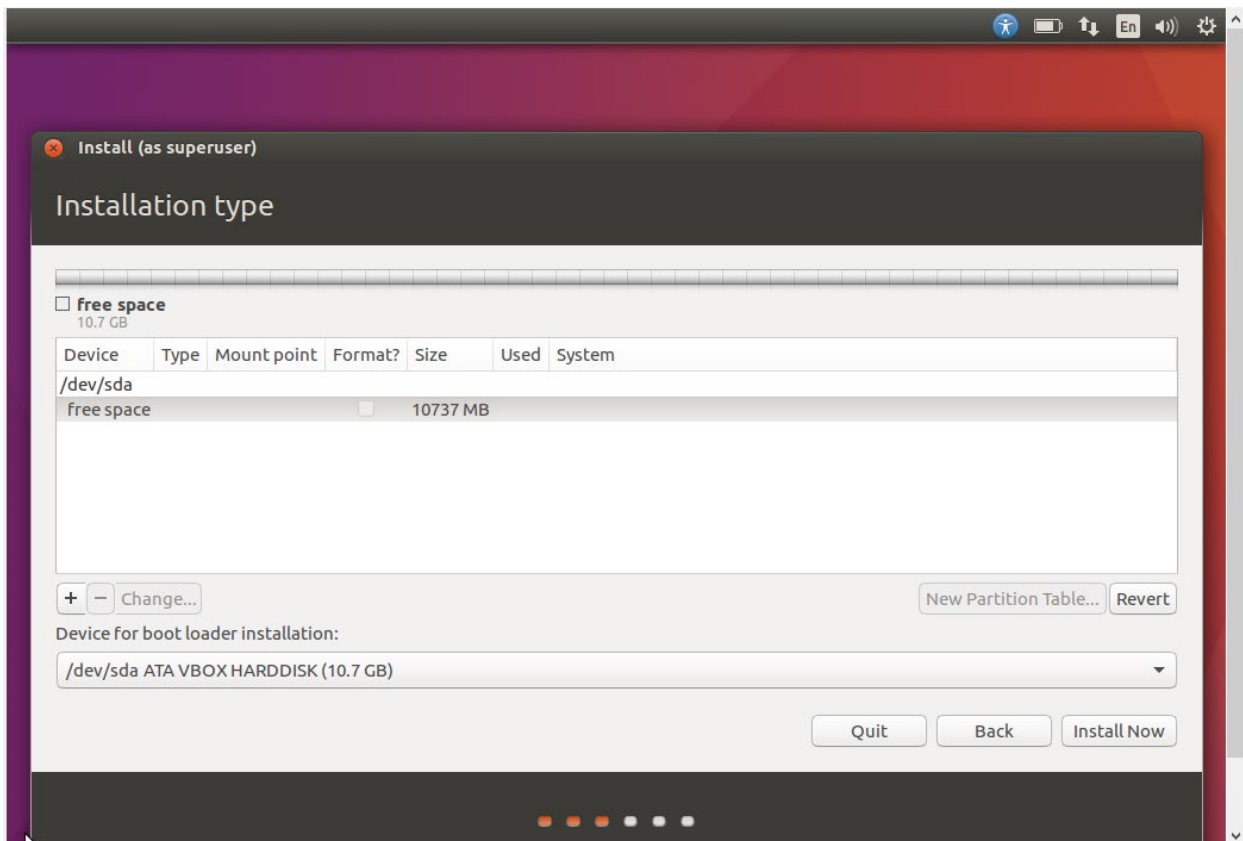
NIM : L200170106

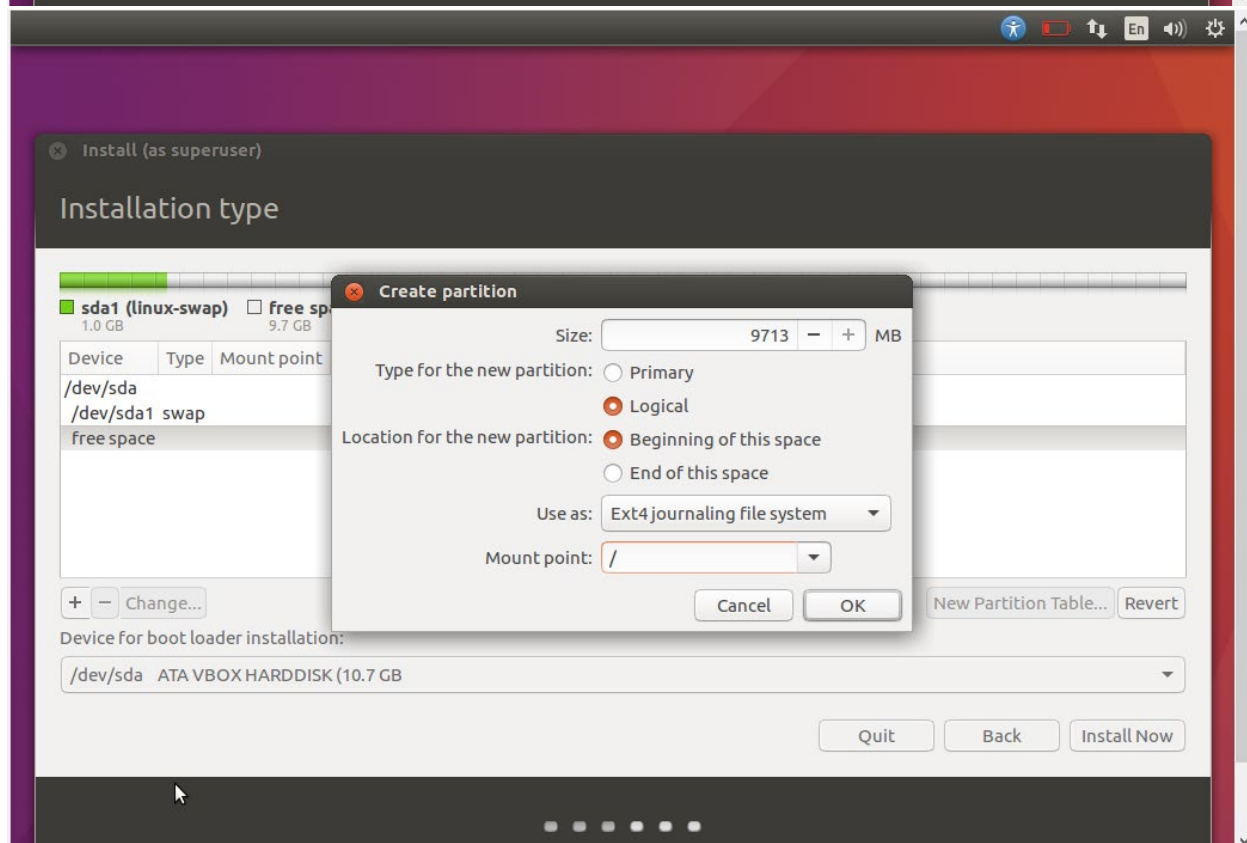
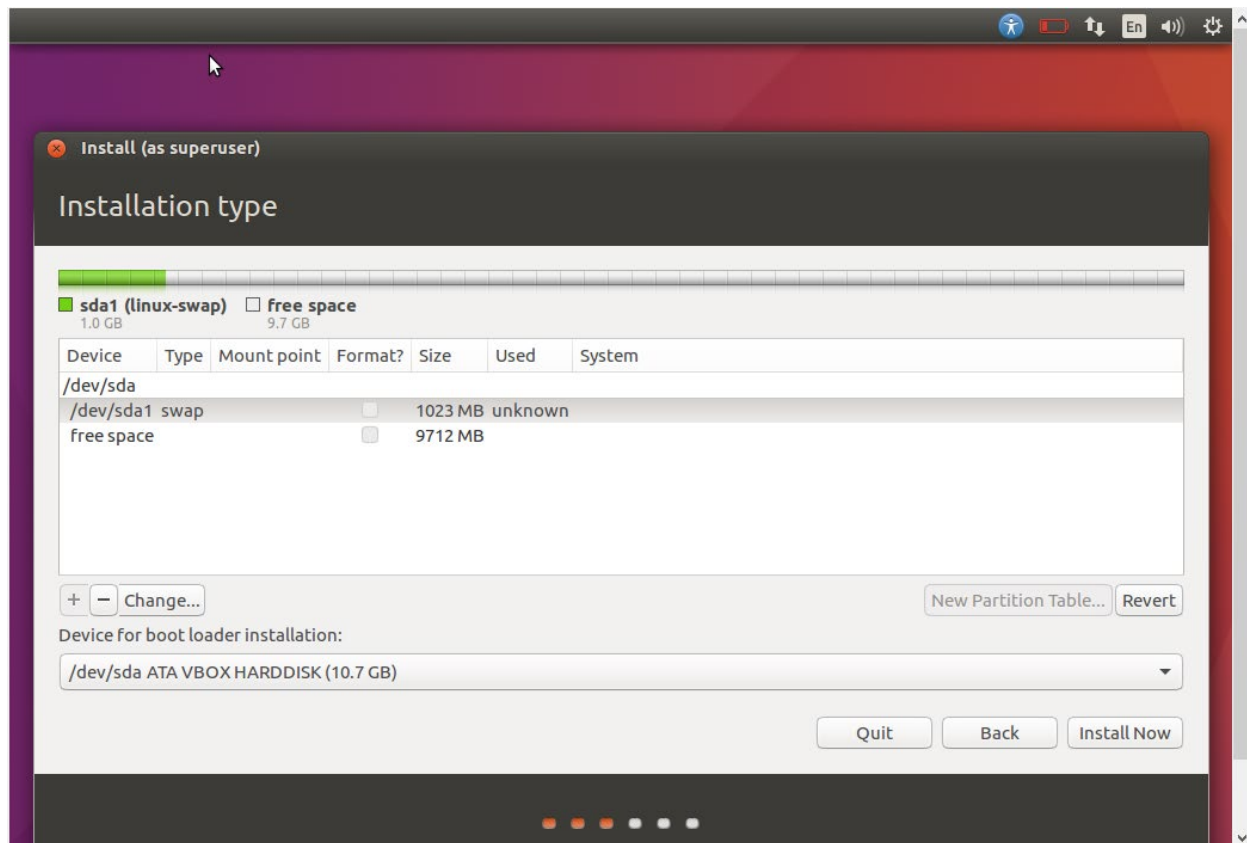
Kelas : E

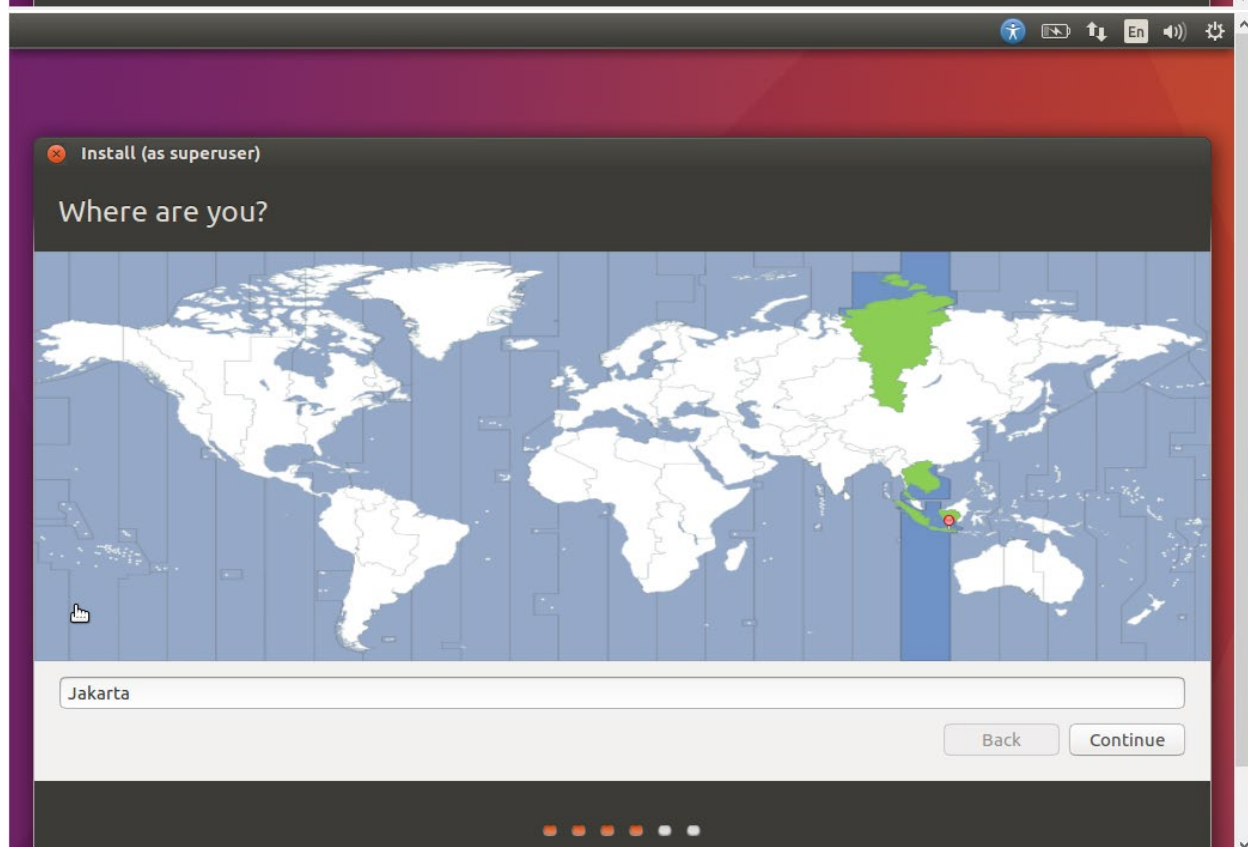
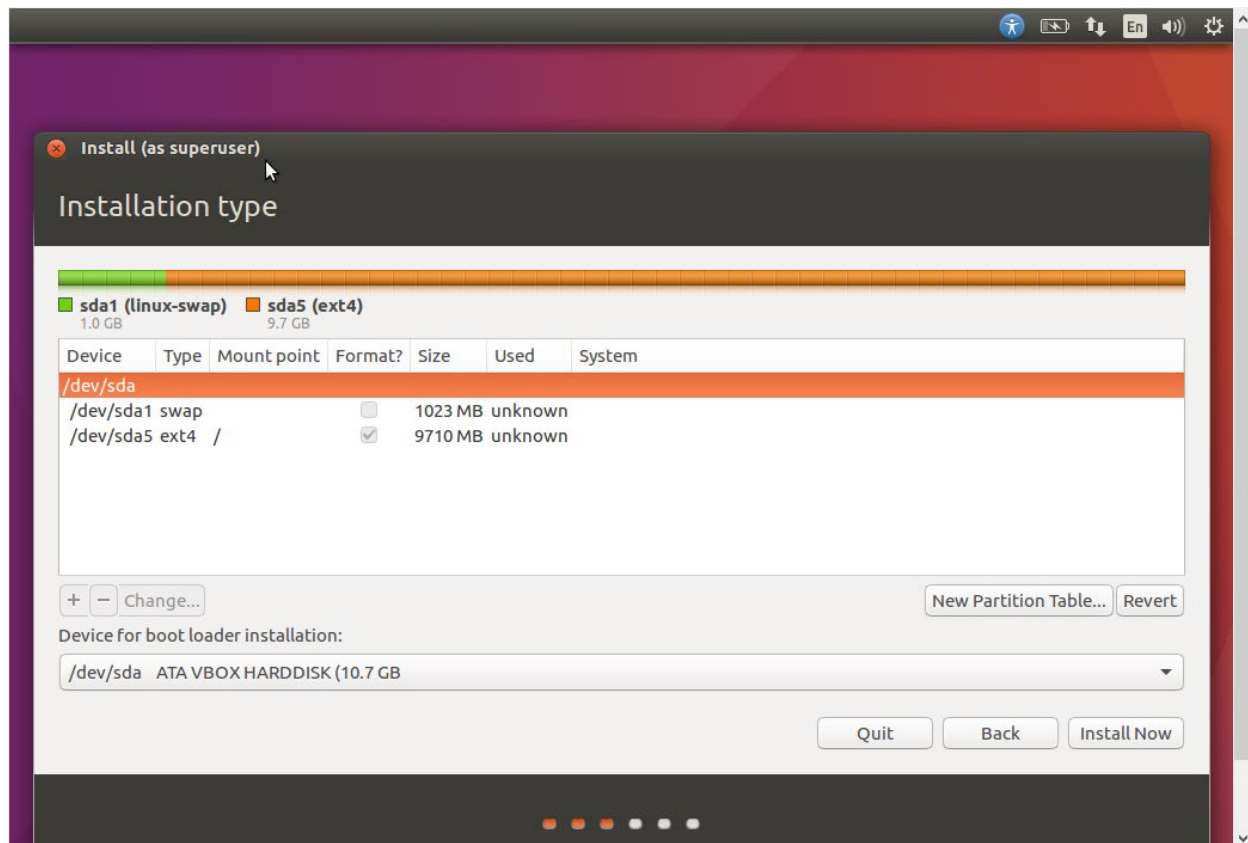
1. Proses penginstalan

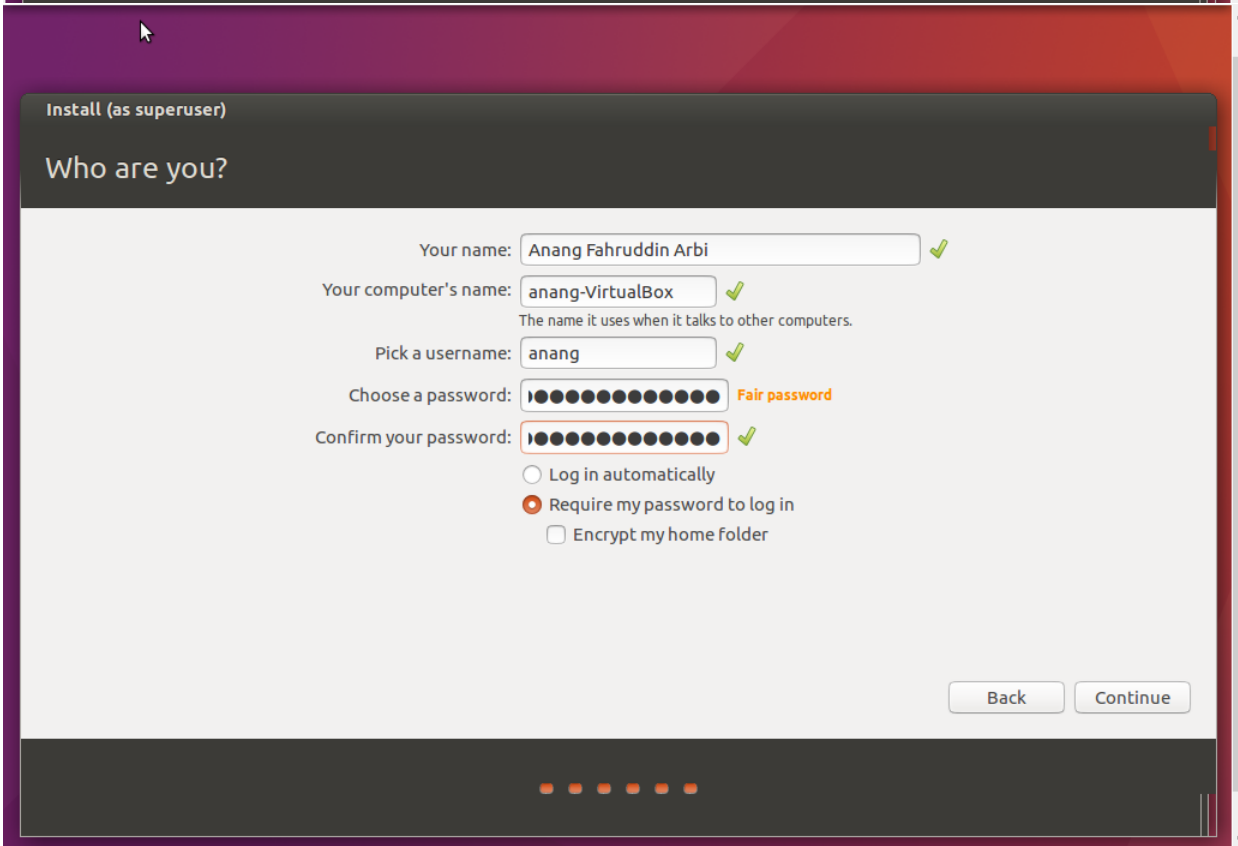
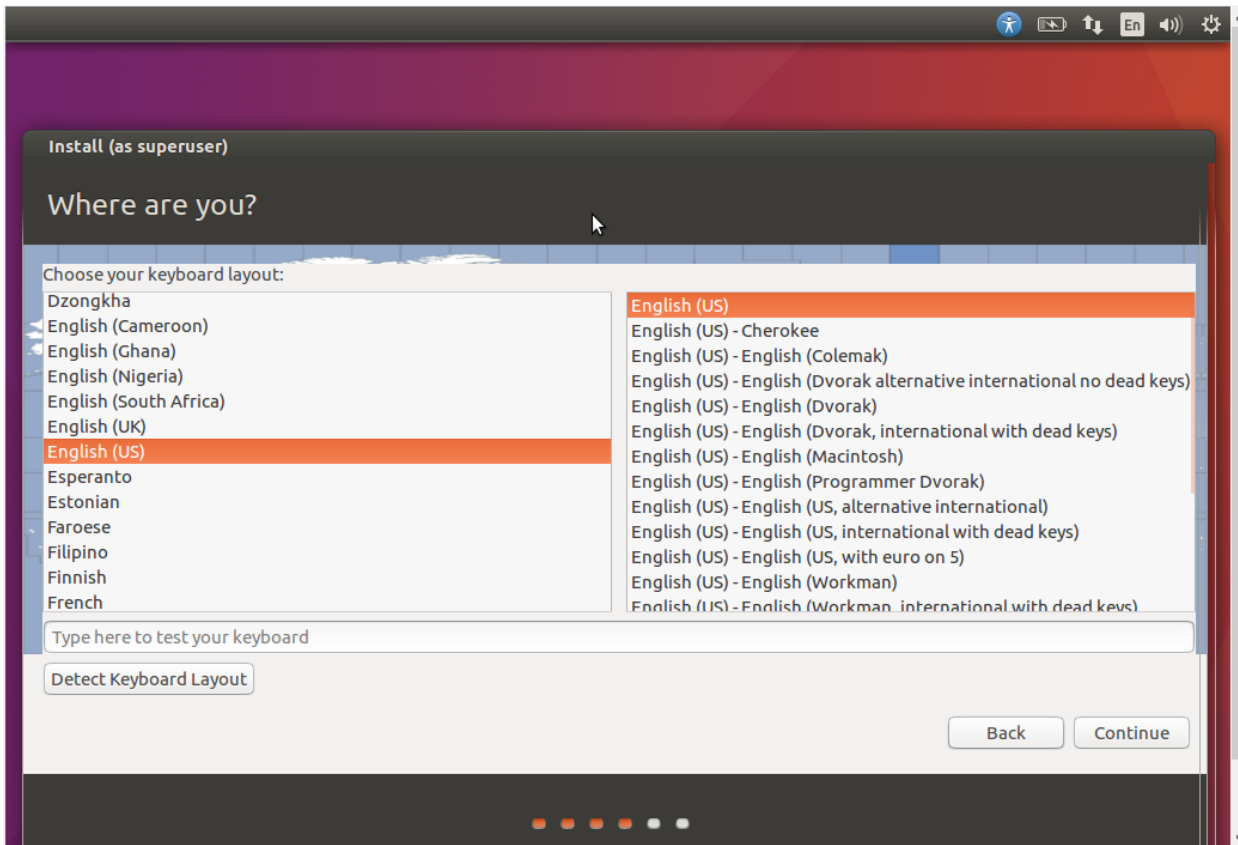












Install (as superuser)

Welcome to Ubuntu

Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for...



▸ Copying files...

Skip

Installation Complete



Installation is complete. You need to restart the computer in order to use the new installation.

Restart Now

Modul 7

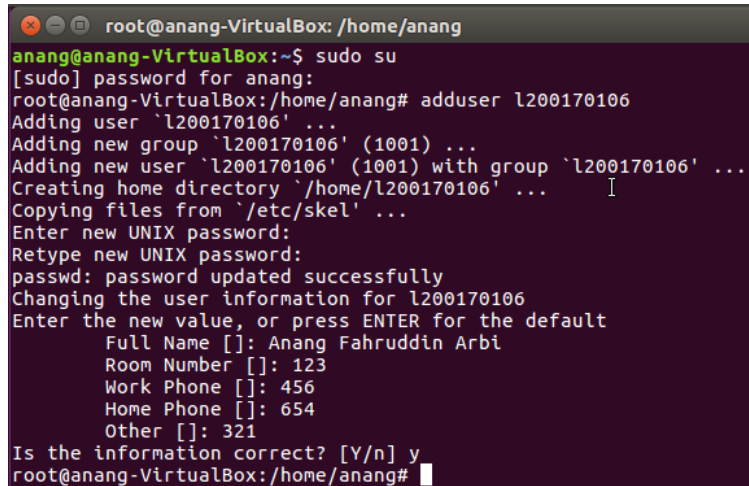
Management User dan Permission Direktori atau File pada Linux

Nama : Anang Fahrudin Arbi

NIM : L200170106

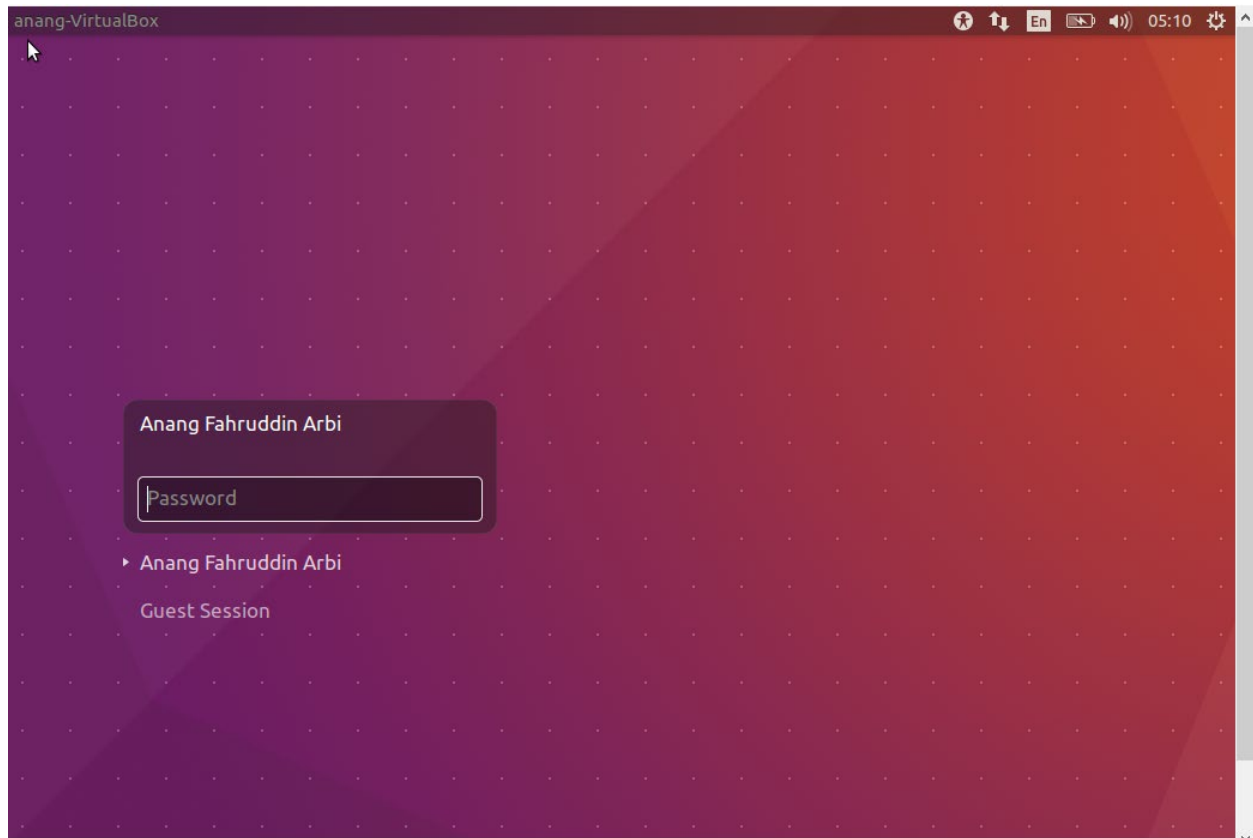
Kelas : E

1. Praktikum 1



```
root@anang-VirtualBox: /home/anang
anang@anang-VirtualBox:~$ sudo su
[sudo] password for anang:
root@anang-VirtualBox:/home/anang# adduser l200170106
Adding user `l200170106' ...
Adding new group `l200170106' (1001) ...
Adding new user `l200170106' (1001) with group `l200170106' ...
Creating home directory `/home/l200170106' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for l200170106
Enter the new value, or press ENTER for the default
  Full Name []: Anang Fahrudin Arbi
    Room Number []: 123
    Work Phone []: 456
    Home Phone []: 654
      Other []: 321
Is the information correct? [Y/n] y
root@anang-VirtualBox:/home/anang#
```

- Membuat user baru lewat terminal linux



- Masuk ke user baru yang telah dibuat
2. Praktikum 2

```

l200170106@anang-VirtualBox:~$ touch latihan
l200170106@anang-VirtualBox:~$ chmod 666 latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
-rw-rw-rw- 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$ chmod 111 latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
---x---x--x 1 l200170106 l200170106 0 Des 16 05:16 latihan
Ubuntu Software 0l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$
l200170106@anang-VirtualBox:~$ chmod 222 latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
--w--w--w- 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$ chmod 333 latihan
l200170106@anang-VirtualBox:~$ ls -l

```

- Permissin Acces

3. Praktikum 3


```

l200170106@anang-VirtualBox:~$ chmod 000 latihan
l200170106@anang-VirtualBox:~$ ls -l latihan
----- 1 l200170106 l200170106 0 Des 16 05:16 latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
----- 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$ chmod +r latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
-r--r--r-- 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$ chmod +w latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
-rw-rw-r-- 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates

```

```

l200170106@anang-VirtualBox:~$ chmod +w latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
-rw-rw-r-- 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$ chmod +x latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
-rwxrwxr-x 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$ chmod -r latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
--wx-wx--x 1 l200170106 l200170106 0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos

```



```

l200170106@anang-VirtualBox:~$ chmod -w latihan
l200170106@anang-VirtualBox:~$ ls-l

ls: ls-l: command not found
l200170106@anang-VirtualBox:~$
l200170106@anang-VirtualBox:~$ ls -ls
total 44
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
12 -rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
 0 ---x--x--x 1 l200170106 l200170106    0 Des 16 05:16 latihan
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
 4 drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$ chmod -x
chmod: missing operand
Try 'chmod --help' for more information.
l200170106@anang-VirtualBox:~$ chmod -x latihan
l200170106@anang-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Desktop
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Documents
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Downloads
-rw-r--r-- 1 l200170106 l200170106 8980 Des 16 05:02 examples.desktop
----- 1 l200170106 l200170106    0 Des 16 05:16 latihan
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Music
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Pictures
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Public
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Templates
drwxr-xr-x 2 l200170106 l200170106 4096 Des 16 05:10 Videos
l200170106@anang-VirtualBox:~$

```

4. Praktikum 4

```

l200170106@anang-VirtualBox: /bin
l200170106@anang-VirtualBox:~$ cd /bin
l200170106@anang-VirtualBox:/bin$ nano info.sh

```

```
l200170106@anang-VirtualBox: /bin
GNU nano 2.5.3 File: info.sh Modified
#!/bin/sh
WAKTU = "Tanggal dan jam saat ini : \c"
JMLUSER = "Jumlah user : \c"
AKU = "Status personal : \c"
echo -e "$WAKTU"
date
echo -e "$JMLUSER"
who | wc -l
echo -e "$AKU"
whoami
exit()

[ Error writing info.sh: Permission denied ]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify ^C Cur Pos
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Linter ^_ Go To Line
```

- Menggunakan nano

Modul 9

File System Call

Nama : Anang Fahrudin Arbi

NIM : L200170106

- A. Membuat sebuah file dan menuliskan data didalamnya
- a. Program dengan algoritma sebagai berikut

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <fcntl.h>

main(int argc, char *argv[]){
    int fd, n, len ;
    char buf[100];
    if (argc != 2)
    {
        printf("Usage: ./a.out <filename>\n");
        exit(-1);
    }
    fd = open(argv[1], O_WRONLY | O_CREAT | O_TRUNC, 0644);
    if (fd < 0 )
    {
        printf("File location problem\n");
        exit(-1);
    }
    printf("Tekan Ctrl+D di akhir baris : \n");

    while((n = read(0, buf, sizeof(buf))) > 0)
    {
        len = strlen(buf);
        write(fd, buf, len);
    }
    close(fd);
}
```

- b. Berikut merupakan hasil eksekusi dari program diatas

```

ubuntu@ubuntu:~$ nano fcreate.c
ubuntu@ubuntu:~$ gcc -o fcreate fcreate.c
fcreate.c:6:1: warning: return type defaults to 'int' [-Wimplicit-int]
main(int argc, char *argv[]){
^
fcreate.c: In function 'main':
fcreate.c:23:13: warning: implicit declaration of function 'read' [-Wimplicit-function-declar
while((n = read(0, buf, sizeof(buf))) > 0)
^
fcreate.c:26:3: warning: implicit declaration of function 'write' [-Wimplicit-function-declar
write(fd, buf, len);
^
fcreate.c:29:2: warning: implicit declaration of function 'close' [-Wimplicit-function-declar
close(fd);
^
ubuntu@ubuntu:~$ ./fcreate test.txt
Tekan Ctrl+D di akhir baris :
Nama = Anang Fahrudin Arbi

```

- B. Membaca sebuah file dan menampilkan isinya dilayar
- Program dengan algoritma sebagai berikut

```

#include <stdio.h>
#include <stdlib.h>
#include <fcntl.h>

int main (int argc, char *argv[]){
    int fd, i;
    char buf[100];
    if (argc < 2)
    {
        printf("Usage: ./a.out <filename\n>");
        exit(1);
    }
    fd = open(argv[1], O_RDONLY);
    if(fd == -1)
    {
        printf("%s file does not exist\n", argv[1]);
        exit(1);
    }

    printf("Isi dari file %s adalah :\n", argv[1]);
    while(read(fd, buf, sizeof(buf))> 0)
        printf("%s", buf);

    close(fd);
}

```

- Berikut merupakan hasil eksekusi program diatas

```

ubuntu@ubuntu:~$ nano fcreate.c
ubuntu@ubuntu:~$ ./fread test.txt
Isi dari file test.txt adalah :
Nama = Anang Fahrudin Arbi
ubuntu@ubuntu:~$ nano fread.c
ubuntu@ubuntu:~$ gcc -o fread fread.c
fread.c: In function 'main':
fread.c:21:8: warning: implicit declaration of function 'read' [-Wimplicit-function-declaration]
  while(read(fd, buf, sizeof(buf))> 0)
        ^
fread.c:24:2: warning: implicit declaration of function 'close' [-Wimplicit-function-declaration]
  close(fd);
  ^
ubuntu@ubuntu:~$ ./fread test.txt
Isi dari file test.txt adalah :
Nama = Anang Fahrudin Arbi
ubuntu@ubuntu:~$

```

C. Menambah isi file

- a. Program dengan algoritma sebagai berikut

```

#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <fcntl.h>
main(int argc, char *argv[]){
    int fd, n, len;
    char buf[100];
    if(argc != 2)
    {
        printf("Usage: ./a.out <filename>\n");
        exit(-1);
    }
    fd = open(argv[1], O_APPEND|O_WRONLY|O_CREAT, 0644);
    if(fd < 0)
    {
        perror(argv[1]);
        exit(-1);
    }

    while((n = read(0,buf, sizeof(buf))) > 0)
    {
        len = strlen(buf);
        write(fd, buf, len);
    }

    close(fd);
}

```

- b. Berikut merupakan hasil eksekusi dari program di atas

```
ubuntu@ubuntu:~$ nano fappend.c
ubuntu@ubuntu:~$ gcc -o fappend fappend.c
fappend.c:5:1: warning: return type defaults to 'int' [-Wimplicit-int]
main(int argc, char *argv[]){
^
fappend.c: In function 'main':
fappend.c:20:13: warning: implicit declaration of function 'read' [-Wimplicit-function-declar
while((n = read(0,buf, sizeof(buf))) > 0)
^
fappend.c:23:3: warning: implicit declaration of function 'write' [-Wimplicit-function-declar
write(fd, buf, len);
^
fappend.c:26:2: warning: implicit declaration of function 'close' [-Wimplicit-function-declar
close(fd);
^
ubuntu@ubuntu:~$ ./fappend test.txt
NIM = L200170106
ubuntu@ubuntu:~$ ./fread test.txt
Isi dari file test.txt adalah :
Nama = Anang Fahrudin Arbi
D♦♦♦NIM = L200170106
o♦♦♦[29]ubuntu@ubuntu:~$
```