

# PRAKTIKUM SISTEM OPERASI

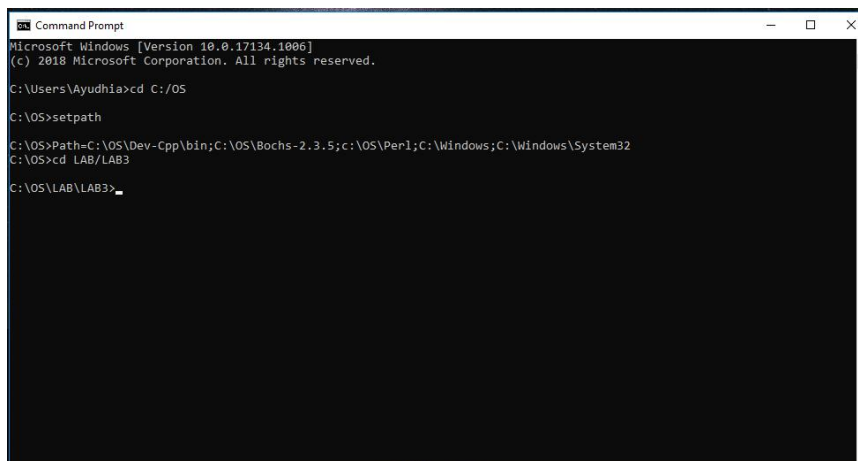
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*B*

## LAPORAN MODUL 3

1. Ketik 'cmd' lanjut dengan 'CD OS', 'setpath', dan 'cd LAB/LAB3'



```
Command Prompt
Microsoft Windows [Version 10.0.17134.1006]
(c) 2018 Microsoft Corporation. All rights reserved.

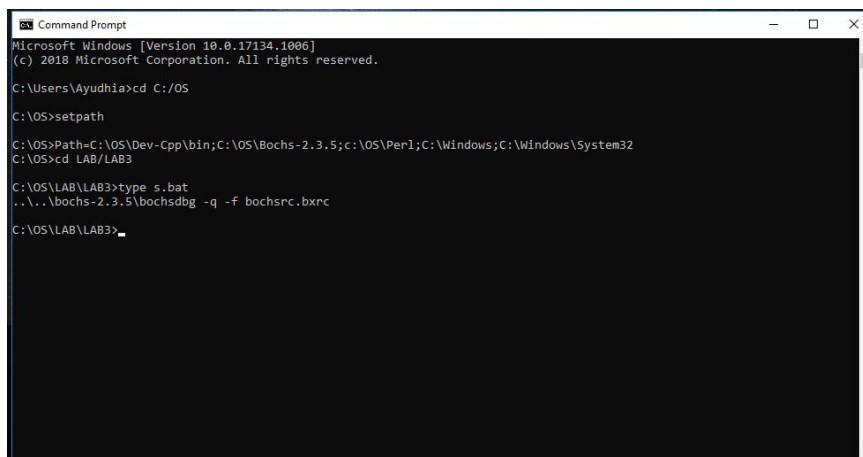
C:\Users\Ayudhia>cd C:/OS

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. Ketik 'type s.bat'



```
Command Prompt
Microsoft Windows [Version 10.0.17134.1006]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Ayudhia>cd C:/OS

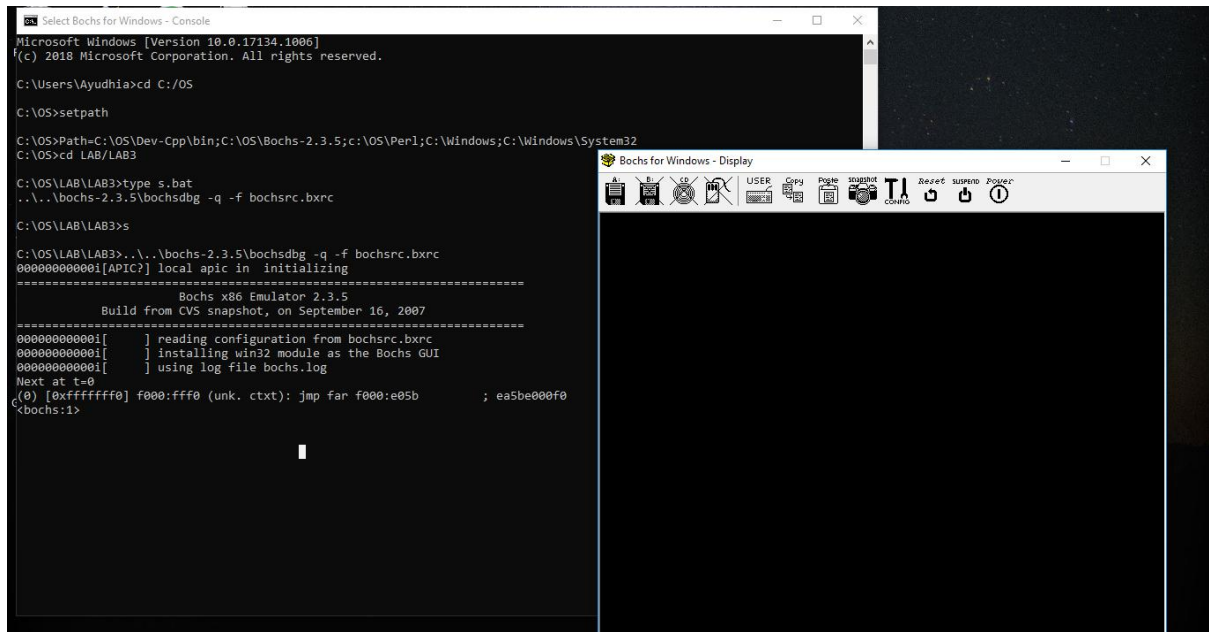
C:\OS>setpath

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

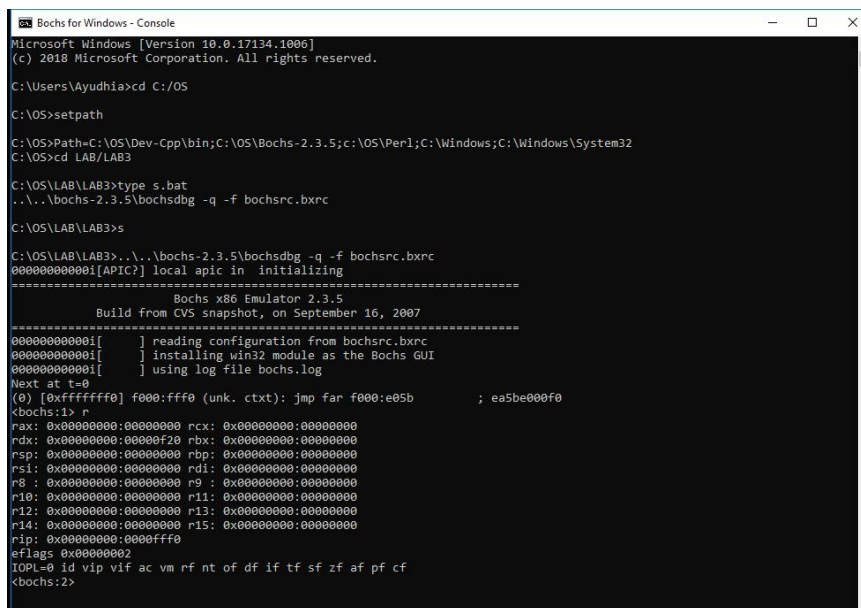
C:\OS\LAB\LAB3>type s.bat
..\..\bochs-2.3.5\bochsdbg -q -f bochsrc.bxrc

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

### 3. Mulai melakukan 'debugging', masukkan perintah 's'



### 4. Ketik 'r' untuk melihat isi register CS dan IP



## 5. Mengeksekusi perintah tersebut

```
Bochs for Windows - Console
C:\OS\LAB\LAB3>
C:\OS\LAB\LAB3>.\..\bochs-2.3.5\bochsrc -q -f bochsrc.bxrc
000000000000[APIC?] local apic in  initializing
=====
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000000[ ] reading configuration from bochsrc.bxrc
000000000000[ ] installing win32 module as the Bochs GUI
000000000000[ ] using log file bochs.log
Next at t=0
(0) [0xfffffff0] f000:fff0 (unk. ctxt): jmp far f000:e05b      ; ea5be00f0
<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            ; 31c0
<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. Kemudian masukkan perintah 'vc 0:0x7c00' untuk membuat pemberhentian di halaman tersebut

```
Bochs for Windows - Console
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
=====
000000000000[ ] reading configuration from bochsrc.bxrc
000000000000[ ] installing win32 module as the Bochs GUI
000000000000[ ] using log file bochs.log
Next at t=0
(0) [0xfffffff0] f000:fff0 (unk. ctxt): jmp far f000:e05b      ; ea5be00f0
<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            ; 31c0
<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> vb 0:0x7c00
<bochs:5> c
(10254512) Breakpoint 10285624, in 0000:7c00 (0x00007c00)
Next at t=2084140
(0) [0x00007c00] 0000:7c00 (unk. ctxt): jmp .+0x003b (0x00007c3e) ; e93b00
<bochs:6>
```

```
Bochs for Windows - Display
Plex86/Bochs UGABios 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/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...
```

7. Ketik '**c**' untuk melanjutkan, dan ketik '**s**' berulang sebanyak 10 kali dan lakukan pengecekan dengan file boot.asm

```

Bochs for Windows - Console
r12: 0x00000000:00000000 r13: 0x00000000:00000000
r14: 0x00000000:00000000 r15: 0x00000000:00000000
rip: 0x00000000:000e05b
eflags 0x00000002
IOPL=0 id vip vif ac vm rf nt of df if tf sf zf af pf cf
<bochs:4> vd 0x07c00
<bochs:5> c
(10264512) Breakpoint 10285624, in 0000:7c00 (0x00007c00)
Next at t=2084140
(0) [0x00007c00] 0000:7c00 (unk. ctxt): jmp .+0x003b (0x00007c3e) ; e93b00
<bochs:6> s
Next at t=2084141
(0) [0x00007c3e] 0000:7c3e (unk. ctxt): cli ; fa
<bochs:7> s
Next at t=2084142
(0) [0x00007c3f] 0000:7c3f (unk. ctxt): mov ax, 0x07c0 ; b8c007
<bochs:8> s
Next at t=2084143
(0) [0x00007c42] 0000:7c42 (unk. ctxt): mov ds, ax ; 8ed8
<bochs:9> s
Next at t=2084144
(0) [0x00007c44] 0000:7c44 (unk. ctxt): mov es, ax ; 8ec0
<bochs:10> s
Next at t=2084145
(0) [0x00007c45] 0000:7c46 (unk. ctxt): mov fs, ax ; 8ee0
<bochs:11> s
Next at t=2084146
(0) [0x00007c48] 0000:7c48 (unk. ctxt): mov gs, ax ; 8ee8
<bochs:12> s
Next at t=2084147
(0) [0x00007c4a] 0000:7c4a (unk. ctxt): mov ax, 0x0000 ; b80000
<bochs:13> s
Next at t=2084148
(0) [0x00007c4d] 0000:7c4d (unk. ctxt): mov ss, ax ; 8ed0
<bochs:14> s
Next at t=2084149
(0) [0x00007c4f] 0000:7c4f (unk. ctxt): mov sp, 0xffff ; bcffff
<bochs:15> s
Next at t=2084150
(0) [0x00007c52] 0000:7c52 (unk. ctxt): sti ; fb
<bochs:16>

```

8. Ketik 'q' untuk menghentikan debugging. Kemudian lakukan debugging lagi dengan cara ketik 's', kemudian ketik **'vb 0x0100:0x0000'** untuk menghentikan langkah saat PC melakukan eksekusi dari program 'kernel.bin' dan ketik 'c'

The image shows a Windows 7 desktop environment. Two windows are open. The left window, titled 'Bochs for Windows - Console', displays the output of a Bochs BIOS boot process. It shows assembly instructions like 'mov sp, 0xffff' and 'sti', along with status messages such as 'Bochs is exiting. Press ENTER when you're ready to close this window.' and 'Bochs X86 Emulator 2.3.5 Build from CVS snapshot, on September 16, 2007'. The right window, titled 'Bochs for Windows - Display', shows the BIOS boot screen. It includes a menu with options like 'USER', 'Copy', 'Paste', 'Screenshot', 'Console', 'Reset', 'Shutdown', and 'Power'. Below the menu, it displays 'Plex86/Bochs UGABIOS 0.6a 19 Aug 2006' and 'This UGA/UBE Bios is released under the GNU LGPL'. It also provides links to 'http://bochs.sourceforge.net' and 'http://www.nongnu.org/ugabios'. The screen shows 'Bochs UBE Display Adapter enabled', 'Bochs BIOS - build: 09/10/07', '\$Revision: 1.183 \$ \$Date: 2007/09/10 20:00:29 \$', and 'Options: apmbios pcibios eltorito rombios32'. At the bottom, it says 'Booting from Floppy...' and 'Loading kernel ver 0.01'. A keyboard layout is visible at the bottom of the display window, showing 'CTRL + 3rd button enables mouse' and 'NUM', 'CAPS', 'SCRL'.

9. Ketik 's' sebanyak 10 kali, lalu bandingkan dengan isi file 'kernel.asm'

```
Bochs for Windows - Console
000000000001[ ] installing win32 module as the Bochs GUI
000000000001[ ] using log file bochs.log
Next at t=0
(0) [0xffffffff] f000:ffff (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 ; 8ed0
<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> s
Next at t=2945023
(0) [0x00001012] 0100:0012 (unk. ctxt): mov es, ax ; 8ec0
<bochs:13>
```

