

ML Assignment

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Batch: S4 Comp

Assignment 7:

Code:

```
section .data

msg1: db 'GDTR contents :', 0xa
len1: equ $ - msg1

msg2: db 'LDTR contents:', 0xa
len2: equ $ - msg2

msg3: db 'IDTR contents :', 0xa
len3: equ $ - msg3

msg4: db 'TR contents:', 0xa
len4: equ $ - msg4

msg5: db 'MSW contents:', 0xa
len5: equ $ - msg5

msg6: db 'We are in protected mode.!!', 0xa
len6: equ $ - msg6

msg7: db ' ', 0xa
len7: equ $ - msg7

msg8: db 'We are not in protected mode.!!', 0xa
len8: equ $ - msg8

msg9: db ' : ', 0xa
len9: equ $ - msg9


section .bss

gdt: resd 01
    resw 01

ldt: resw 01

idt: resd 01
```

```
    resw 01  
tr: resw 01  
msw: resw 01  
result: resw 01
```

```
section .text  
global _start
```

```
_start:  
    smsw [msw]  
    sgdt [gdt]  
    sldt [ldt]  
    sidt [idt]  
    str [tr]  
  
    mov ax, [msw]  
    bt ax, 0  
    jc next  
  
    mov rax, 1  
    mov rdi, 1  
    mov rsi, msg8  
    mov rdx, len8  
    syscall  
    jmp exit
```

```
next:  
    mov rax, 1  
    mov rdi, 1  
    mov rsi, msg6  
    mov rdx, len6  
    syscall
```

```
; GDTR
```

```
mov rax, 1
mov rdi, 1
mov rsi, msg1
mov rdx, len1
syscall
mov bx, word [gdt + 4]
call HtoA
mov bx, word [gdt + 2]
call HtoA
mov rax, 1
mov rdi, 1
mov rsi, msg9
mov rdx, len9
syscall
mov bx, word [gdt]
call HtoA
```

; LDTR

```
mov rax, 1
mov rdi, 1
mov rsi, msg7
mov rdx, len7
syscall
mov rax, 1
mov rdi, 1
mov rsi, msg2
mov rdx, len2
syscall
mov bx, word [ldt]
call HtoA
```

; IDTR

```
mov rax, 1
mov rdi, 1
```

```
mov rsi, msg7
mov rdx, len7
syscall
mov rax, 1
mov rdi, 1
mov rsi, msg3
mov rdx, len3
syscall
mov bx, word [idt + 4]
call HtoA
mov bx, word [idt + 2]
call HtoA
mov rax, 1
mov rdi, 1
mov rsi, msg9
mov rdx, len9
syscall
mov bx, word [idt]
call HtoA
```

```
; TR
```

```
mov rax, 1
mov rdi, 1
mov rsi, msg7
mov rdx, len7
syscall
mov rax, 1
mov rdi, 1
mov rsi, msg4
mov rdx, len4
syscall
mov bx, word [tr]
call HtoA
```

```
; MSW
mov rax, 1
mov rdi, 1
mov rsi, msg7
mov rdx, len7
syscall
mov rax, 1
mov rdi, 1
mov rsi, msg5
mov rdx, len5
syscall
mov bx, word [msw]
call HtoA
```

```
; EXIT
exit:
    mov rax, 60
    mov rdi, 0
    syscall
```

```
HtoA:
    mov rcx, 4
    mov rdi, result
```

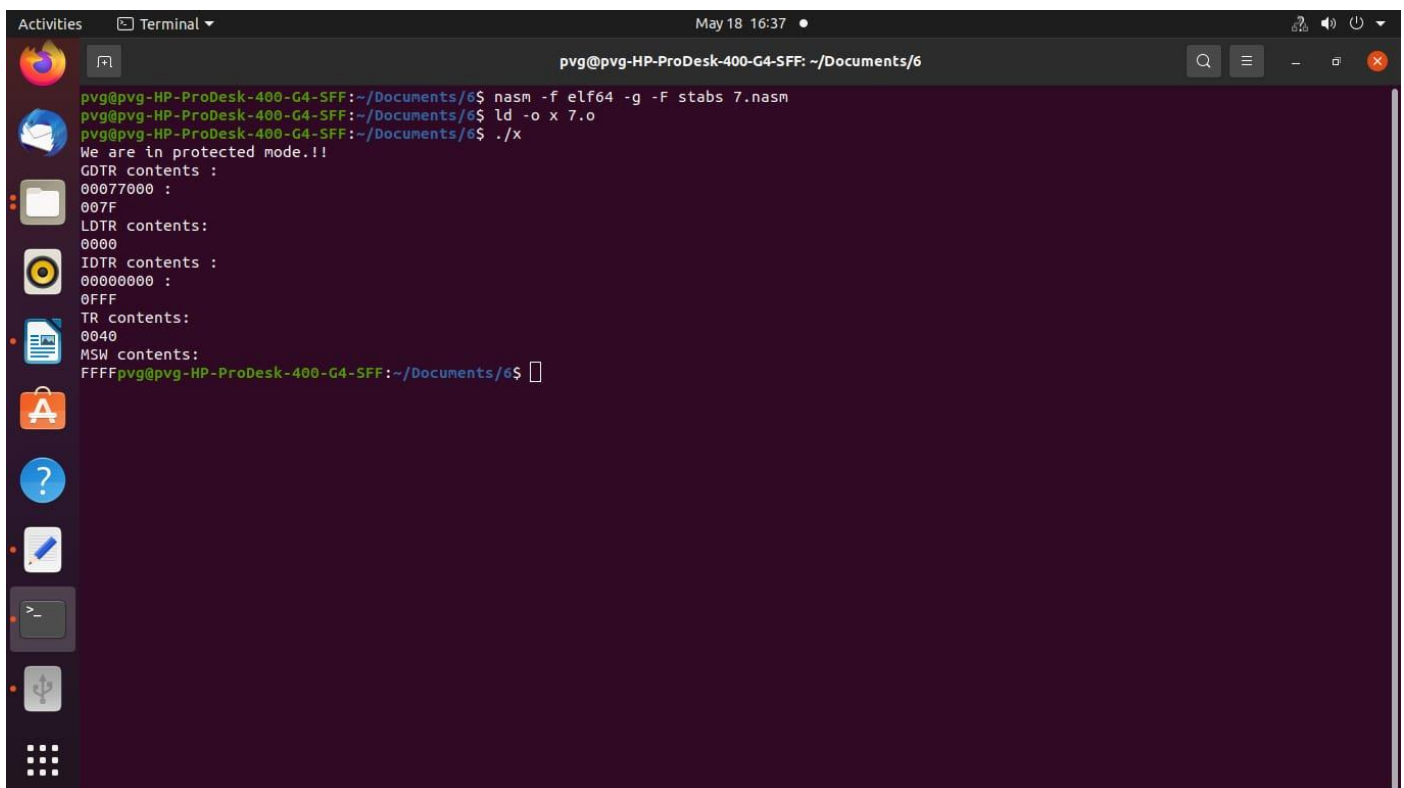
```
dup1:
    rol bx, 4
    mov al, bl
    and al, 0fh
    cmp al, 09h
    jg p3
    add al, 30h
    jmp p4
```

```
p3:
    add al, 37h
```

```
p4:
```

```
mov [rdi], al
inc rdi
loop dup1
mov rax, 1
mov rdi, 1
mov rsi, result
mov rdx, 4
syscall
ret
```

Output:



The screenshot shows a terminal window titled "Terminal" with the date and time "May 18 16:37". The user is logged in as "pvg" on a machine named "pvg-HP-ProDesk-400-G4-SFF". The terminal shows the following commands and output:

```
pvg@pvg-HP-ProDesk-400-G4-SFF:~/Documents/6$ nasm -f elf64 -g -F stabs 7.nasm
pvg@pvg-HP-ProDesk-400-G4-SFF:~/Documents/6$ ld -o x 7.o
pvg@pvg-HP-ProDesk-400-G4-SFF:~/Documents/6$ ./x
We are in protected mode.!!
GDTR contents :
00077000 :
007F
LDTR contents:
0000
IDTR contents :
00000000 :
0FFF
TR contents:
0040
MSW contents:
FFFFpvg@pvg-HP-ProDesk-400-G4-SFF:~/Documents/6$
```