



جامعة عفت

EFFAT UNIVERSITY

CS 3101

Operating Systems - Spring 2023

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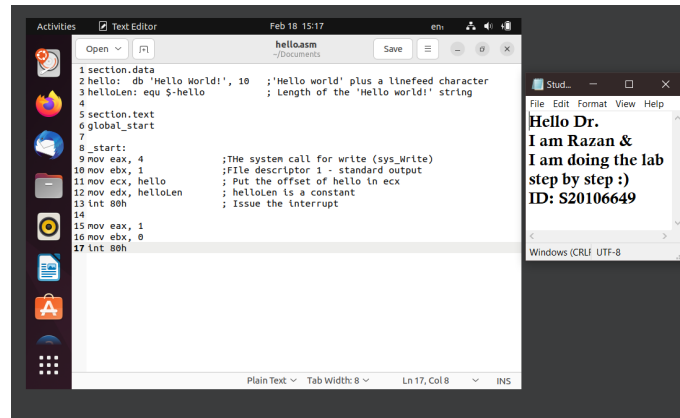
Date Last Edited: February 6, 2024

Contents

1 Task 1:	2
1.1 Creating the asm file:	2
2 Task 2:	2
2.1 Compiling and running the new executable (/hello):	2
2.2 tracing system calls (strace):	2

1 Task 1:

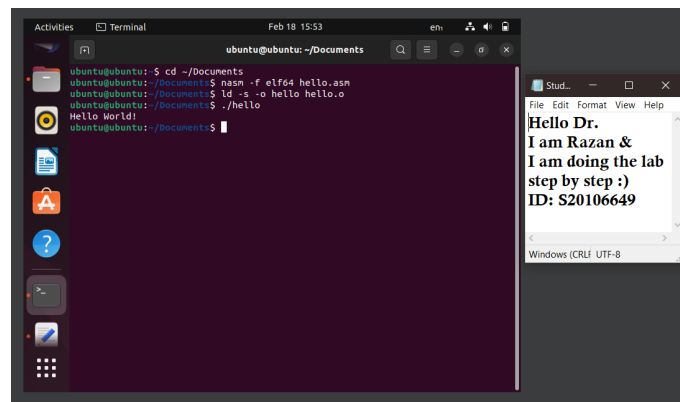
1.1 Creating the asm file:



```
1 section.data
2 hello: db 'Hello World!', 10      ; 'Hello world' plus a newline character
3 helloLen: equ $-hello           ; Length of the 'Hello world!' string
4
5 section.text
6 global _start
7
8 _start:
9     mov eax, 4                   ; The system call for write (sys_write)
10    mov ebx, 1                   ; File descriptor 1 - standard output
11    mov ecx, hello               ; Put the offset of hello in ecx
12    mov edx, helloLen            ; helloLen is a constant
13    int 80h                     ; Issue the interrupt
14
15    mov eax, 1
16    mov ebx, 0
17    int 80h
```

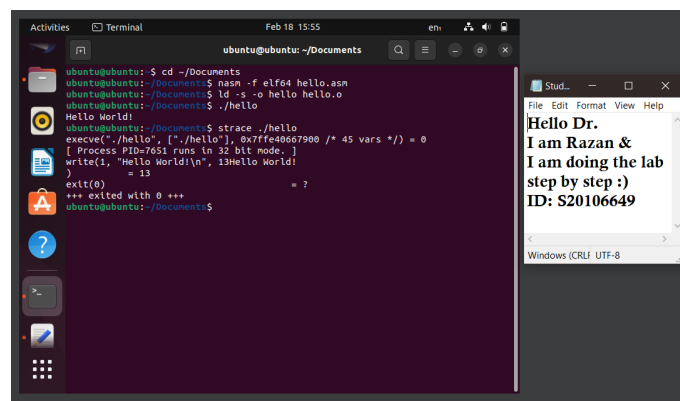
2 Task 2:

2.1 Compiling and running the new executable (./hello):



```
ubuntu@ubuntu: ~/Documents
ubuntu@ubuntu:~/Documents$ cd ~/Documents
ubuntu@ubuntu:~/Documents$ nasm -f elf64 hello.asm
ubuntu@ubuntu:~/Documents$ ld -s -o hello hello.o
ubuntu@ubuntu:~/Documents$ ./hello
Hello World!
```

2.2 tracing system calls (strace):



```
ubuntu@ubuntu:~/Documents$ strace ./hello
execve("./hello", ["/hello"], 0x7ffe48667900 /* 45 vars */) = 0
[ Process PID=7651 runs in 32 bit mode. ]
write(1, "Hello World!\n", 13Hello World!
)                                = 13
exit(0)                          = 0
+++ exited with 0 +++
ubuntu@ubuntu:~/Documents$
```