

# OPERATING SYSTEM



Assignment # 01

STUDENT NAME: UMAIR AZAD

ROLL NO : 19P-0030

SECTION : 5A

**Fast National University of Computer and Emerging  
Sciences, Peshawar  
Department of Computer Science**

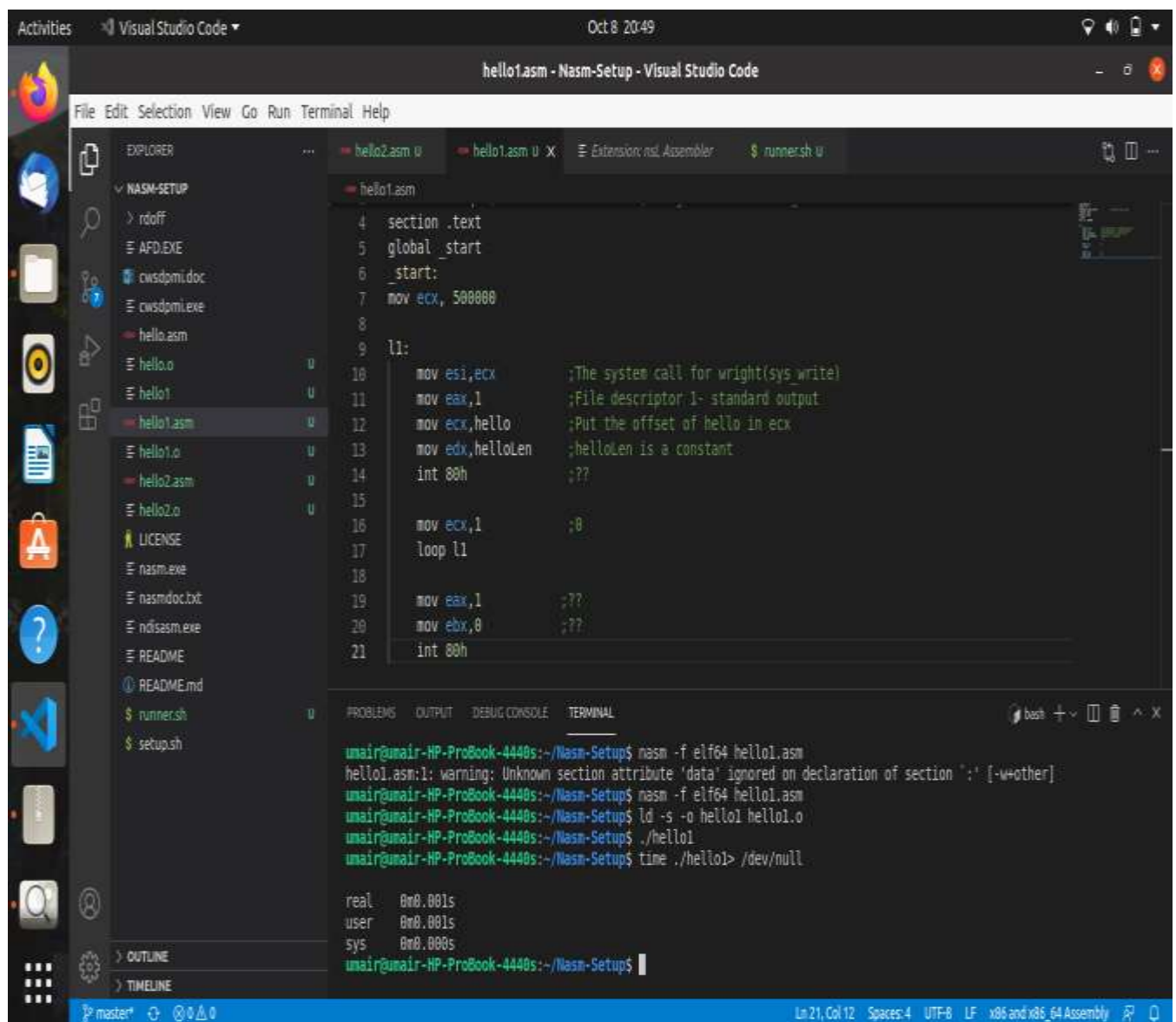
## Conclusions:

No of experiments run N=50

Average 'user time' for helo1 (int-based calls) I =0.0092

Average 'user time' for Hello2 (syscall-based calls) S =0.0094

Percentage speedup (I-S) \* 100 / I =-921.7



The screenshot shows the Visual Studio Code editor with the file `hello1.asm` open. The file explorer on the left shows the project structure, including `NASM-SETUP` and various files. The main editor displays the assembly code for `hello1.asm`, which includes a `section .text`, `global _start`, and a loop that calls `sys_write` to print "hello". The terminal at the bottom shows the commands used to assemble and run the program, along with the timing results.

```
4 section .text
5 global _start
6 _start:
7 mov ecx, 500000
8
9 ll:
10 mov esi,ecx ;The system call for wright(sys_write)
11 mov eax,1 ;File descriptor 1- standard output
12 mov ecx,hello ;Put the offset of hello in ecx
13 mov edx,helloLen ;helloLen is a constant
14 int 80h ;??
15
16 mov ecx,1 ;0
17 loop ll
18
19 mov eax,1 ;??
20 mov ebx,0 ;??
21 int 80h
```

```
umair@umair-HP-ProBook-4440s:~/Nasm-Setup$ nasm -f elf64 hello1.asm
hello1.asm:1: warning: Unknown section attribute 'data' ignored on declaration of section ': [-w+other]
umair@umair-HP-ProBook-4440s:~/Nasm-Setup$ nasm -f elf64 hello1.asm
umair@umair-HP-ProBook-4440s:~/Nasm-Setup$ ld -s -o hello1 hello1.o
umair@umair-HP-ProBook-4440s:~/Nasm-Setup$ ./hello1
umair@umair-HP-ProBook-4440s:~/Nasm-Setup$ time ./hello1 > /dev/null

real    0m0.001s
user    0m0.001s
sys      0m0.000s
umair@umair-HP-ProBook-4440s:~/Nasm-Setup$
```

Visual Studio Code - Oct 8 20:52

hello1.txt - Nasm-Setup - Visual Studio Code

```
File Edit Selection View Go Run Terminal Help
EXPLORER
  NASM-SETUP
    > idoff
    E AFD-RAE
    E cwsdpmi.doc
    E cwsdpmi.exe
    E hello.asm
    E hello.o
    E hello1
    E hello1.asm
    E hello1.o
    E hello1.txt
    E hello2
    E hello2.asm
    E hello2.o
    E hello2.txt
    E nasm.exe
    E nasm.doc.txt
    E ndasm.exe
    E README
    E README.md
    E runner.sh
    E setup.sh
  OUTLINE
  TIMELINE
  hello1.txt
1
2 real 0m0.000s
3 user 0m0.000s
4 sys 0m0.000s
5
6 real 0m0.001s
7 user 0m0.001s
8 sys 0m0.000s
9
10 real 0m0.000s
11 user 0m0.000s
12 sys 0m0.000s
13
14 real 0m0.001s
15 user 0m0.001s
16 sys 0m0.000s
17
18 real 0m0.000s
19 user 0m0.000s
20 sys 0m0.000s
21
22 real 0m0.001s
23 user 0m0.001s
24 sys 0m0.000s
25
26 real 0m0.001s
27 user 0m0.001s
28 sys 0m0.000s
29
30 real 0m0.001s
31 user 0m0.001s
32 sys 0m0.000s
```

Visual Studio Code - Oct 8 21:03

hello2.asm - Nasm-Setup - Visual Studio Code

```
File Edit Selection View Go Run Terminal Help
EXPLORER
  NASM-SETUP
    > idoff
    E AFD-EXE
    E cwsdpmi.doc
    E cwsdpmi.exe
    E hello.asm
    E hello.o
    E hello1
    E hello1.asm
    E hello1.o
    E hello1.txt
    E hello2
    E hello2.asm
    E hello2.o
    E hello2.txt
    E nasm.exe
    E nasm.doc.txt
    E ndasm.exe
    E README
    E README.md
    E runner.sh
    E setup.sh
  OUTLINE
  TIMELINE
  hello2.asm
1 section: data
2 hello: db ' '
3 helloLen: equ $-hello
4 section: text
5 global _start
6 _start:
7 mov ecx, 500000
8 li:
9 mov ebx, ecx
10 mov rdi, 1
11 mov rsi, hello
12 mov rdx, helloLen
13 mov rax, 1
14 syscall
15 mov ecx, ebx
16 loop li
17 mov rdi, 0
18 mov rax, 60
19 syscall
20
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
unair@unair-HP-ProBook-4440s:~/Nasm-Setup$ nasm -f elf64 -o hello1.o hello1.asm
unair@unair-HP-ProBook-4440s:~/Nasm-Setup$ nasm -f elf64 -o hello2.o hello2.asm
unair@unair-HP-ProBook-4440s:~/Nasm-Setup$ ld -s -o hello1 hello1.o
unair@unair-HP-ProBook-4440s:~/Nasm-Setup$ ld -s -o hello2 hello2.o
unair@unair-HP-ProBook-4440s:~/Nasm-Setup$ chmod +x runner.sh
unair@unair-HP-ProBook-4440s:~/Nasm-Setup$ ./runner.sh
unair@unair-HP-ProBook-4440s:~/Nasm-Setup$
```

