

Operating Systems

Assignment # 02

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20p-0117

BSSE-4A

```
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ nasm -f elf64 hello.asm
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ ld -s -o hello hello.o
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ ./hello
```

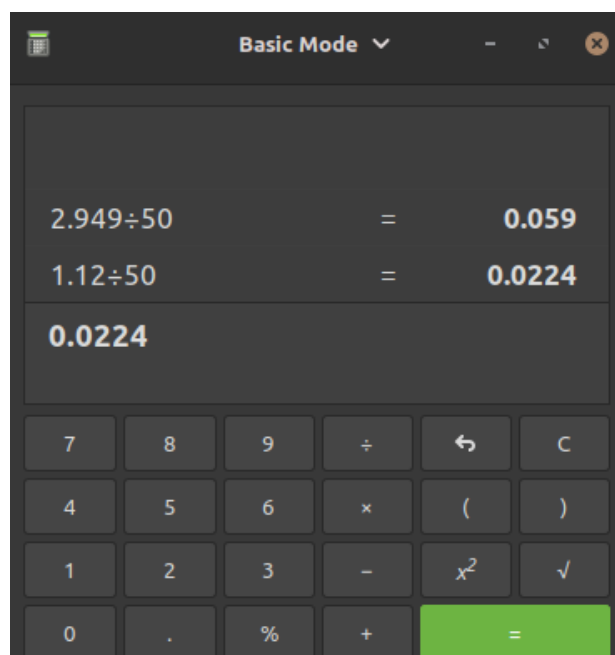
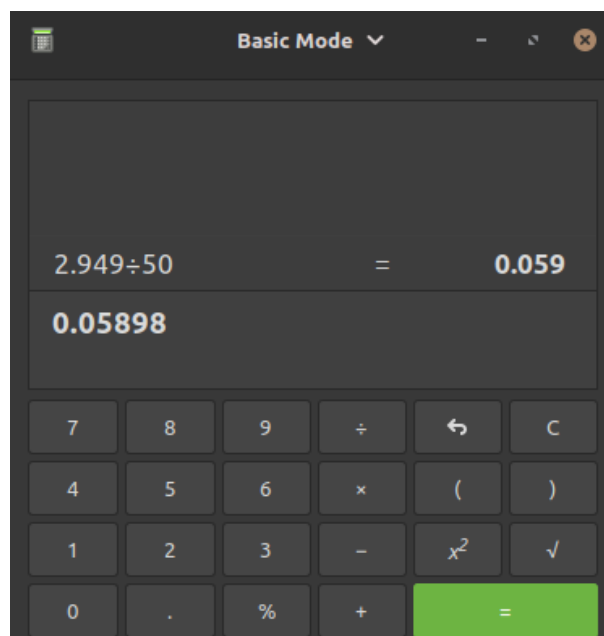
```
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ time ./hello > /dev/null

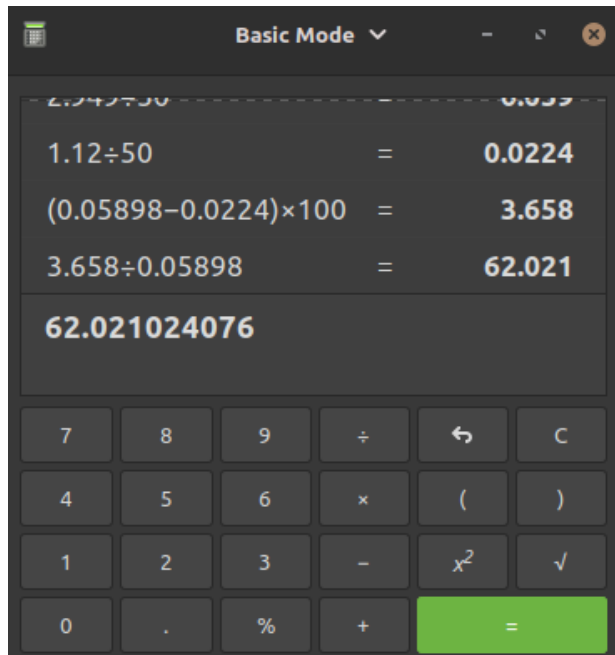
real    0m0.185s
user    0m0.060s
```

```
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ nasm -f elf64 hello.asm
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ nasm -f elf64 -o hello.o hello.asm
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ nasm -f elf64 -o hello2.o hello2.asm
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ ld -s -o hello hello.o
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ █
```

```
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ chmod +x runner.sh
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ ./runner.sh
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ █
```

```
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ grep user hello.txt >> resultHello.txt
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ grep user hello2.txt >> resultHello2.txt
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ awk '{sum += $1} END {print sum}' resultHello.txt
2.949
(base) hamza@hamza-Lenovo-ideapad-320-15ABR:~/Documents/Semester no.4/Operating Systems/Assignments/2/a02/a02$ awk '{sum += $1} END {print sum}' resultHello2.txt
1.12
```





Number of experiments run: $N = 50$

Average 'user time' for hello (int-based calls): $I = 0.05898$

Average 'user time' for hello2 (syscall-based calls): $S = 0.0224$

Percentage speedup: $(I-S) \times 100 / I = 62.0210$