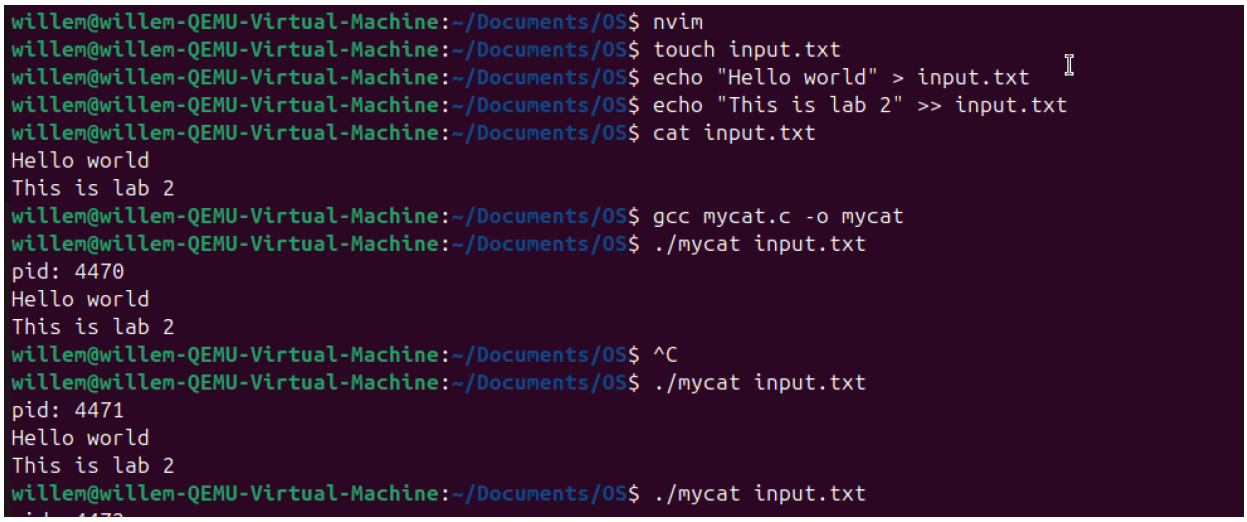


willem@willem-QEMU-Virtual-Machine:~/Documents/OS$ strace ./mycat input.txt
execve("./mycat", ["./mycat", "input.txt"], 0xffffff6d91248 /* 49 vars */) = 0
brk(NULL) = 0xb3510487d000
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0xe5077e719000
faccessat(AT_FDCWD, "/etc/ld.so.preload", R_OK) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=60399, ...}) = 0
mmap(NULL, 60399, PROT_READ, MAP_PRIVATE, 3, 0) = 0xe5077e70a000
close(3) = 0
openat(AT_FDCWD, "/lib/aarch64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0\267\0\1\0\0\0\360\206\2\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=1722920, ...}) = 0
mmap(NULL, 1892240, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_DENYWRITE, -1, 0) = 0xe5077e512000
mmap(0xe5077e520000, 1826704, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0) = 0xe5077e520000
munmap(0xe5077e512000, 57344) = 0
munmap(0xe5077e6de000, 8080) = 0
mprotect(0xe5077e6ba000, 77824, PROT_NONE) = 0
mmap(0xe5077e6cd000, 20480, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19d000) = 0xe5077e6cd000
mmap(0xe5077e6d2000, 49040, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0xe5077e6d2000
close(3) = 0
set_tid_address(0xe5077e719fb0) = 4484
set_robust_list(0xe5077e719fc0, 24) = 0
rseq(0xe5077e71a600, 0x20, 0, 0xd428bc00) = 0
mprotect(0xe5077e6cd000, 12288, PROT_READ) = 0
mprotect(0xb350f99cf000, 4096, PROT_READ) = 0

```
mprotect(0xe5077e71e000, 8192, PROT_READ) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0
munmap(0xe5077e70a000, 60399)           = 0
getpid()                                = 4484
fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0
getrandom("\xc6\xe4\xba\x37\x99\xac\xc3\x7e", 8, GRND_NONBLOCK) = 8
brk(NULL)                               = 0xb3510487d000
brk(0xb3510489e000)                     = 0xb3510489e000
write(1, "pid: 4484\n", 10pid: 4484
)            = 10
clock_nanosleep(CLOCK_REALTIME, 0, {tv_sec=1, tv_nsec=0}, 0xffffdd8674a8) = 0
openat(AT_FDCWD, "input.txt", O_RDONLY) = 3
read(3, "Hello world\nThis is lab 2\n", 1023) = 26
write(1, "Hello world\n", 12Hello world
)           = 12
write(1, "This is lab 2\n", 14This is lab 2
)         = 14
read(3, "", 1023)                       = 0
close(3)                                = 0
exit_group(0)                           = ?
+++ exited with 0 +++
```

1) What are the system call names for getting the process ID, opening a file, closing a file, reading a file, printing to the console and sleeping?

Getting pid: getpid();
Opening a file: openat();
Closing a file: close();
Reading a file: read();
Print to console: write();
Sleep: clock_nanosleep();

2) What are the number of system calls for opening, closing and reading the file(s) (i.e. how many times each was called).

openat() was called by the program only once
close() was called only once as well
read() was only called once

3) What are the number of system calls for printing to the screen? (count each individually. You may either use strace options to aid you in doing so, or you may use grep).

It used write() to print to the screen 3 times

4) What was the value of the file descriptor of your read file (please review the lecture slides before asking what this means)?

The file descriptor was set to 3 by the openat() function.