

Özgür Öney
21101821
CS342 – 2
Assoc. Prof. Dr. Özcan Öztürk

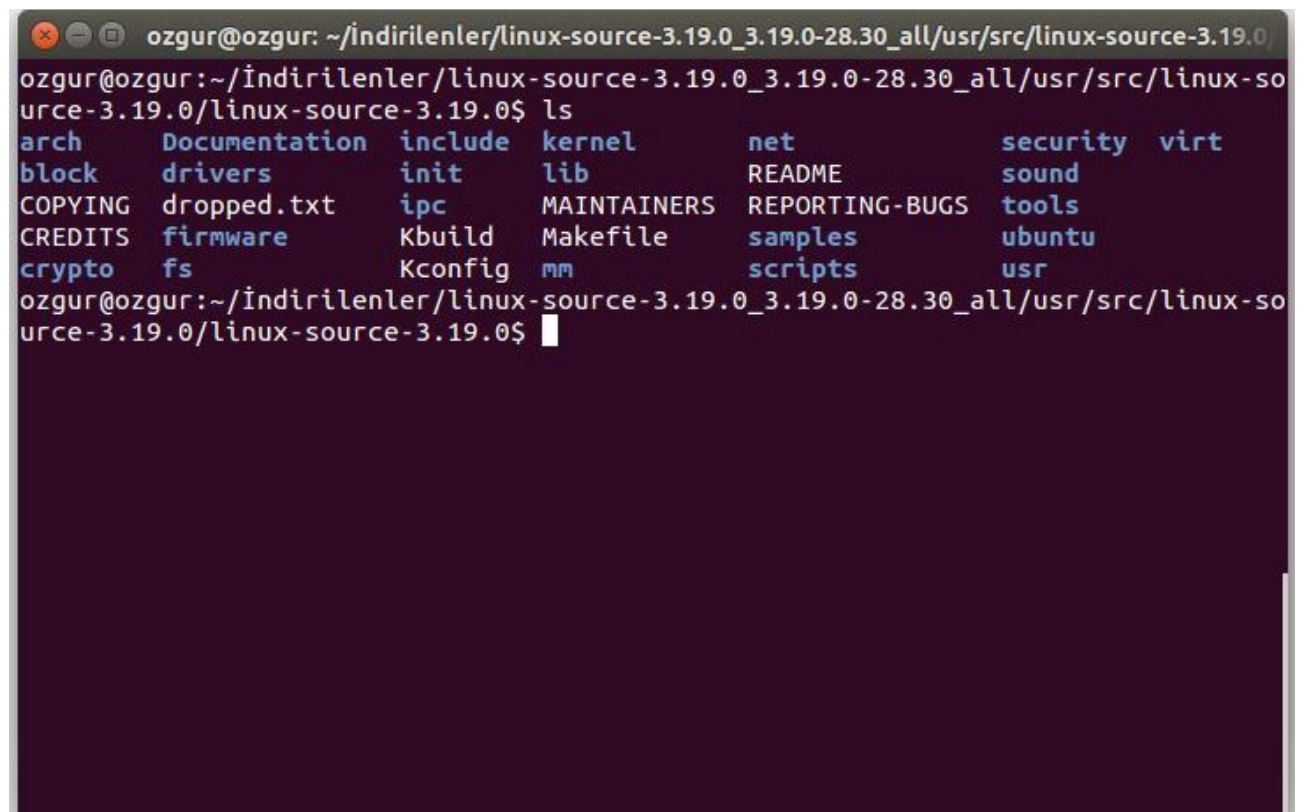
Homework 1

Assigned: Sep 11, 2015, Friday

Due date: Sep 19, 2015, Saturday, 23:55pm.

Q2) Kernel executable is in the path lib/modules/3.19.0-28-generic/kernel

3.19.0-28-generic is the version of my running kernel. After given instructions are followed and root directory has been changed to source code's directory, following subdirectories were reached.



```
ozgur@ozgur: ~/indirilenler/linux-source-3.19.0_3.19.0-28.30_all/usr/src/linux-source-3.19.0/
ozgur@ozgur:~/indirilenler/linux-source-3.19.0_3.19.0-28.30_all/usr/src/linux-so
urce-3.19.0/linux-source-3.19.0$ ls
arch      Documentation  include  kernel      net          security  virt
block     drivers       init     lib          README       sound
COPYING   dropped.txt   ipc      MAINTAINERS  REPORTING-BUGS  tools
CREDITS   firmware     Kbuild   Makefile     samples      ubuntu
crypto    fs            Kconfig  mm           scripts      usr
ozgur@ozgur:~/indirilenler/linux-source-3.19.0_3.19.0-28.30_all/usr/src/linux-so
urce-3.19.0/linux-source-3.19.0$
```

Q4) **strace** command in Linux is used to trace system calls. Since every user process has an interact with kernel by invoking system calls, **strace** utility logs these system calls respectively. Thanks to these, programs' interactions with the system could be monitored and tracked down. Following figure shows what Terminal did to show trace of executable after compilation.

```

ozgur@ozgur:~/Masaüstü/HW1
ozgur@ozgur:~$ strace ./intersection
strace: Can't stat './intersection': No such file or directory
ozgur@ozgur:~$ cd Masaüstü
ozgur@ozgur:~/Masaüstü$ cd HW1
ozgur@ozgur:~/Masaüstü/HW1$ gcc intersection.c -o intersection
ozgur@ozgur:~/Masaüstü/HW1$ strace ./intersection
strace: Can't stat './intersection': No such file or directory
ozgur@ozgur:~/Masaüstü/HW1$ strace ./intersection
execve("./intersection", ["/.intersection"], [/ 69 vars */]) = 0
brk(0) = 0x19e6000
access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7ff3c7dc5000
access("/etc/ld.so.preload", R_OK) = -1 ENOENT (No such file or directory)
open("/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=81798, ...}) = 0
mmap(NULL, 81798, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7ff3c7db1000
close(3) = 0
access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)
open("/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\3\0\0\1\0\0\0\32\0\37\2\0\0\0\0"...
, 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=1840928, ...}) = 0
mmap(NULL, 3949248, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7ff3c77e0000
mprotect(0x7ff3c799b000, 2093056, PROT_NONE) = 0
mmap(0x7ff3c7b9a000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1ba000) = 0x7ff3c7b9a000
mmap(0x7ff3c7ba0000, 17088, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7ff3c7ba0000
close(3) = 0
mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7ff3c7db0000
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7ff3c7dae000
arch_prctl(ARCH_SET_FS, 0x7ff3c7dae740) = 0
mprotect(0x7ff3c7b9a000, 16384, PROT_READ) = 0
mprotect(0x601000, 4096, PROT_READ) = 0
mprotect(0x7ff3c7dc7000, 4096, PROT_READ) = 0
munmap(0x7ff3c7db1000, 81798) = 0
brk(0) = 0x19e6000

```