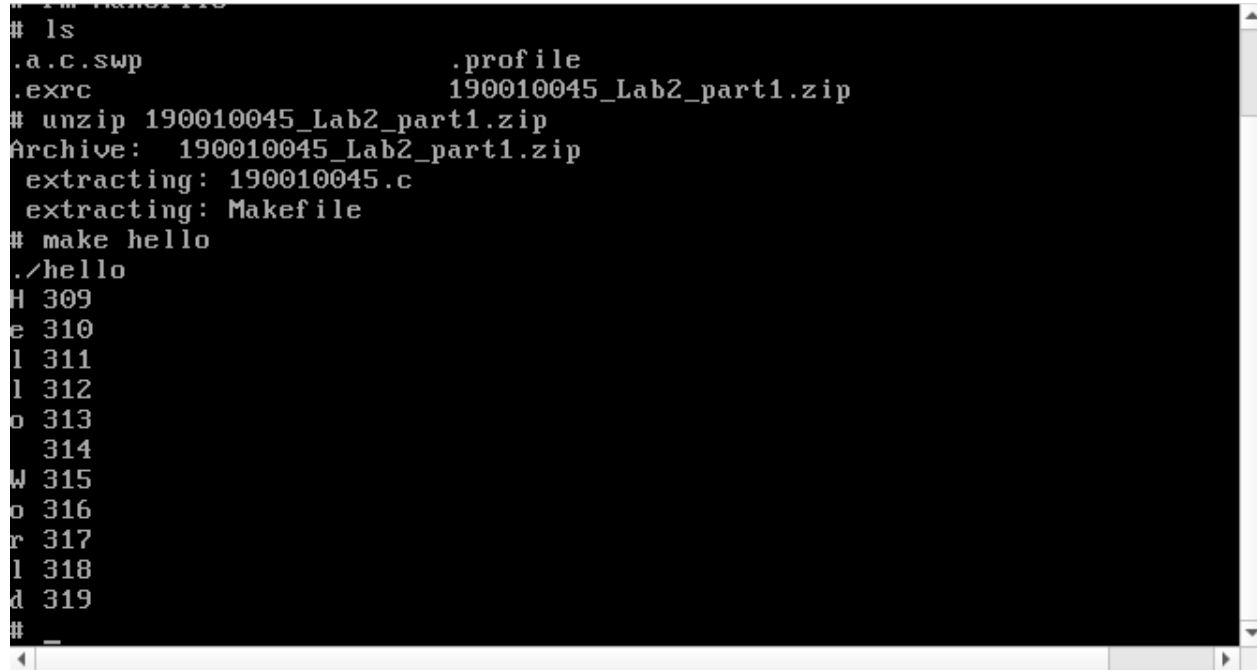# Assignment-2
Operating Systems Lab
190010045

PART-I

Minimum number of lines of C code with which I got output is **20**.

Attaching screenshot of code output in Minix3:

```
# ls
.a.c.swp                    .profile
.exrc                       190010045_Lab2_part1.zip
# unzip 190010045_Lab2_part1.zip
Archive:  190010045_Lab2_part1.zip
 extracting: 190010045.c
 extracting: Makefile
# make hello
./hello
H 309
e 310
l 311
l 312
o 313
  314
W 315
o 316
r 317
l 318
d 319
#
```

PART-II

All processes are created in a form of tree with the parent coming first,followed by the child process.They exit in such a way that child exit first,followed by the parent.
To get the required output I changed forkexit.c at location /usr/src/minix/servers/pm.
Added 2 printf statements

```
printf("Minix: PID %d created\n", rmc->mp_pid);
 printf("Minix: PID %d exited\n", mp->mp_pid);
```

In do_fork() and do_exit() functions respectively.
Then updated the file in minix and built and rebooted.
Attaching the screenshots:

```
do-hdboot ===> releasetools
install -N /usr/src/etc -c -p -r ../minix/servers/ds/ds /boot/minix/.temp/mod01_
ds
install -N /usr/src/etc -c -p -r ../minix/servers/rs/rs /boot/minix/.temp/mod02_
rs
install -N /usr/src/etc -c -p -r ../minix/servers/pm/pm /boot/minix/.temp/mod03_
pm
install -N /usr/src/etc -c -p -r ../minix/servers/sched/sched /boot/minix/.temp/
mod04_sched
install -N /usr/src/etc -c -p -r ../minix/servers/vfs/vfs /boot/minix/.temp/mod0
5_vfs
install -N /usr/src/etc -c -p -r ../minix/drivers/storage/memory/memory /boot/mi
nix/.temp/mod06_memory
install -N /usr/src/etc -c -p -r ../minix/drivers/tty/tty/tty /boot/minix/.temp/
mod07_tty
install -N /usr/src/etc -c -p -r ../minix/fs/mfs/mfs /boot/minix/.temp/mod08_mfs
install -N /usr/src/etc -c -p -r ../minix/servers/vm/vm /boot/minix/.temp/mod09_
vm
install -N /usr/src/etc -c -p -r ../minix/fs/pfs/pfs /boot/minix/.temp/mod10_pfs
install -N /usr/src/etc -c -p -r ../sbin/init/init /boot/minix/.temp/mod11_init
git: not found
Done.
Build started at:  Fri Jan 21 00:29:02 IST 2022
Build finished at: Fri Jan 21 01:03:22 IST 2022
#
```

After building,it will show the process created and exited statements with
their pid's if we run any commands.
Attaching screenshots for some example commands:

```
Minix/i386 (172.20.10.5) (console)

login: root
Password:
Copyright (c) 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,
    2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
    The NetBSD Foundation, Inc.  All rights reserved.
Copyright (c) 1982, 1986, 1989, 1991, 1993
    The Regents of the University of California.  All rights reserved.

For post-installation usage tips such as installing binary
packages, please see:
http://wiki.minix3.org/UsersGuide/PostInstallation

For more information on how to use MINIX 3, see the wiki:
http://wiki.minix3.org

We'd like your feedback: http://minix3.org/community/

Minix: PID 212 created
Minix: PID 212 exited
Minix: PID 213 created
Minix: PID 213 exited
#
```

```
# ls
Minix: PID 214 created
.a.c.swp                   190010045_Lab2_part1.zip   hello
.exrc                      190010045_Lab2_part2.zip   log.txt
.profile                   Makefile                   run.sh
190010045.c                forkexit.c
Minix: PID 214 exited
#
```

```
# cd usr/
# ls
Minix: PID 217 created
Makefile    bin         lib         man         run         src
adm         etc         libdata     mdec        sbin        tests
ast         games       libexec     pkg         share       tmp
benchmarks  include     log         preserve    spool       var
Minix: PID 217 exited
```

```
# cd src
# ls
Minix: PID 218 created
LICENSE         common      games       minix           sys
Makefile        distrib     gnu         params          tests
Makefile.inc    docs        include     releasetools    tools
bin             etc         lib         sbin            usr.bin
build.sh        external    libexec     share           usr.sbin
Minix: PID 218 exited
```

```
# clang 190010045.c
Minix: PID 223 created
Minix: PID 224 created
Minix: PID 224 exited
Minix: PID 225 created
Minix: PID 225 exited
Minix: PID 223 exited
#
```