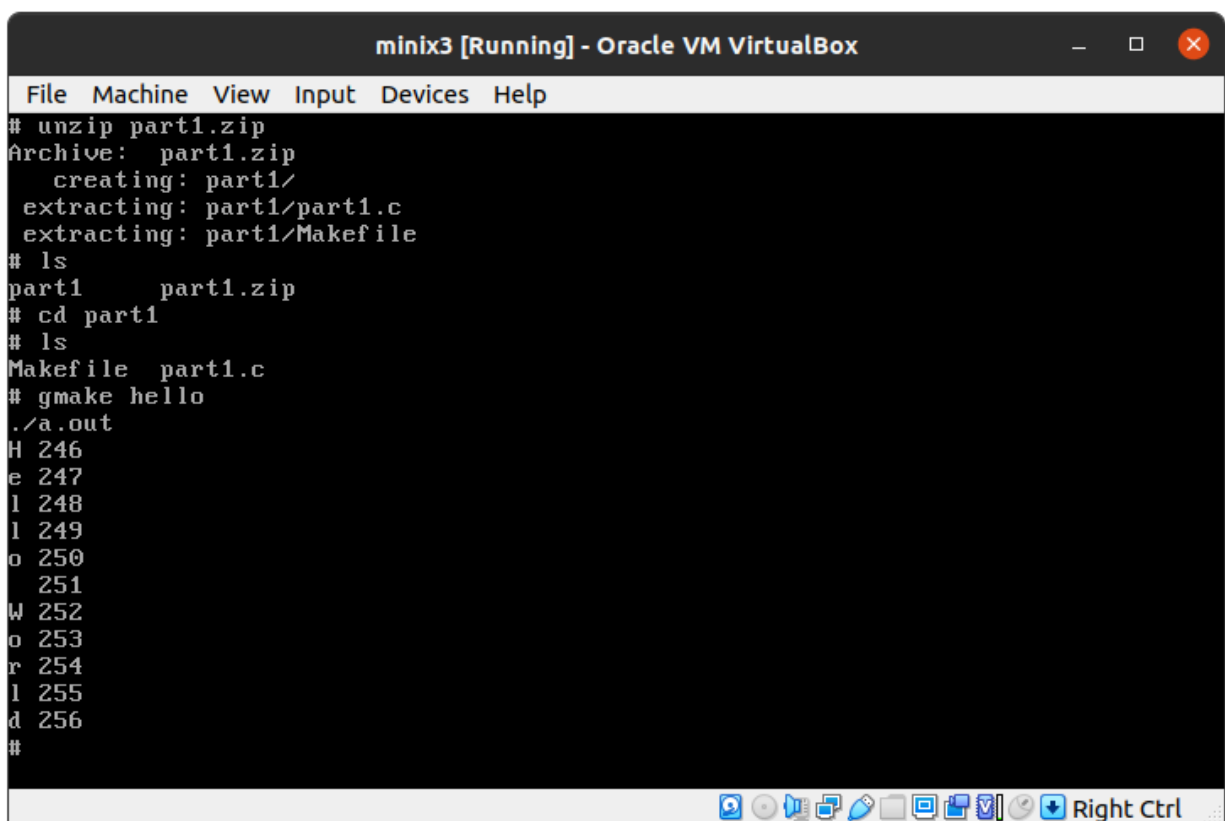


OS LAB: ASSIGNMENT - 2

1 Part I

The minimum lines of C code with which I achieved the given task is 22 (with proper style and libraries included).

I tested the code on my Minix3 virtual machine. Below is the screenshot of the same:



```
minix3 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
# unzip part1.zip
Archive:  part1.zip
  creating: part1/
  extracting: part1/part1.c
  extracting: part1/Makefile
# ls
part1      part1.zip
# cd part1
# ls
Makefile  part1.c
# gmake hello
./a.out
H 246
e 247
l 248
l 249
o 250
  251
W 252
o 253
r 254
l 255
d 256
#
```

2 Part II

The processes are generated in a tree-like way, with the parent process coming first, followed by the child process, and the processes exit in reverse order, with the child process exiting first, followed by the parent process. This sequence is justified because a parent process cannot generate a child process until it has spawned itself, and it must wait for the child process to exit before exiting.

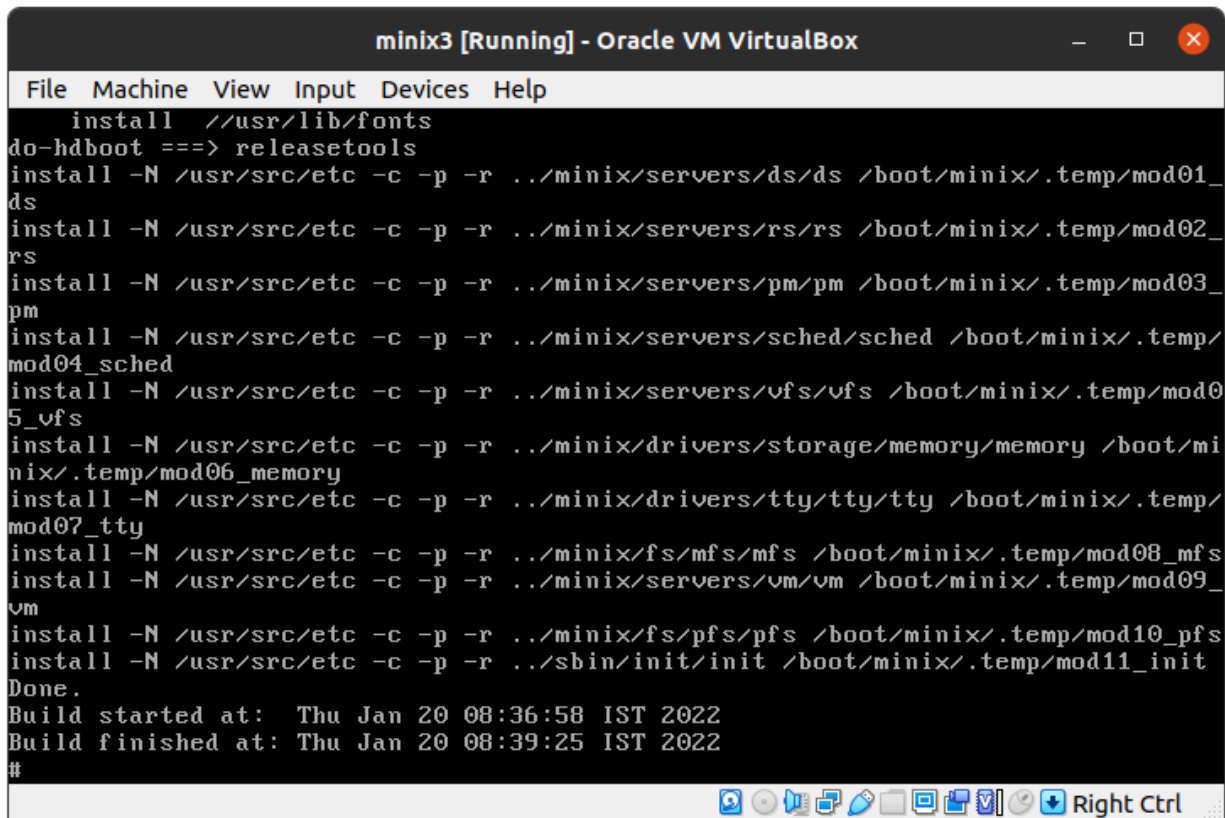
To achieve the given task I edited file `forkexit.c` which was at location `/usr/src/minix/servers/pm/` and inserted 2 `printf` statements:

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

These statements are inserted at positions where a process is spawned and terminated respectively.

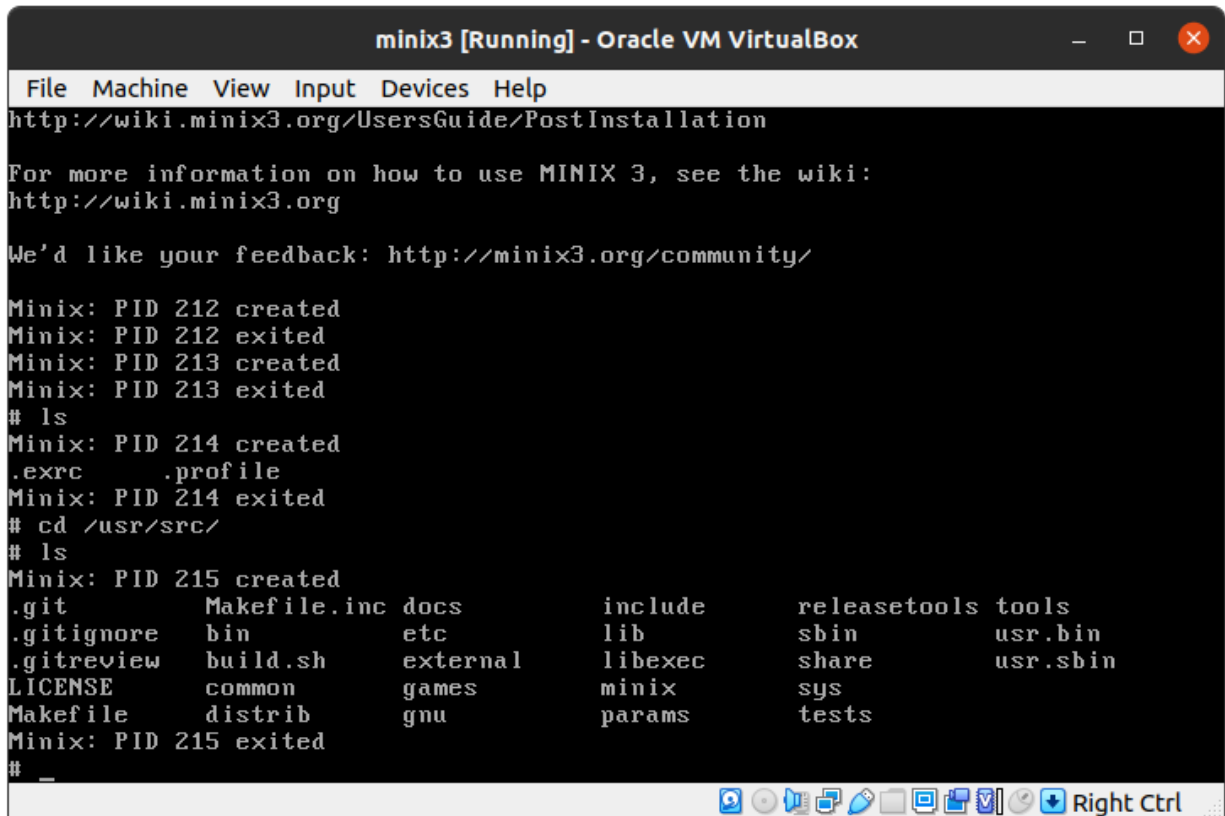
Then I build the system and reboot it.

Below is the screenshot for the same:



```
minix3 [Running] - Oracle VM VirtualBox  
File Machine View Input Devices Help  
install //usr/lib/fonts  
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  
Done.  
Build started at: Thu Jan 20 08:36:58 IST 2022  
Build finished at: Thu Jan 20 08:39:25 IST 2022  
#
```

So, if we run any command it'll show the sequence of processes created and exited. The pid of each process will be printed when it is created and also terminated. Below is the screenshot for the same:



```
minix3 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
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
.exrc      .profile
Minix: PID 214 exited
# cd /usr/src/
# ls
Minix: PID 215 created
.git       Makefile.inc docs      include   releasetools tools
.gitignore bin        etc       lib        sbin      usr.bin
.gitreview build.sh   external  libexec    share     usr.sbin
LICENSE    common    games     minix      sys
Makefile   distrib   gnu       params     tests
Minix: PID 215 exited
# _
```