

CS314 - Lab 2

Part I :

`fork()` is used to create a child process. The return value from this, is used to decide whether the current process is a parent or child.

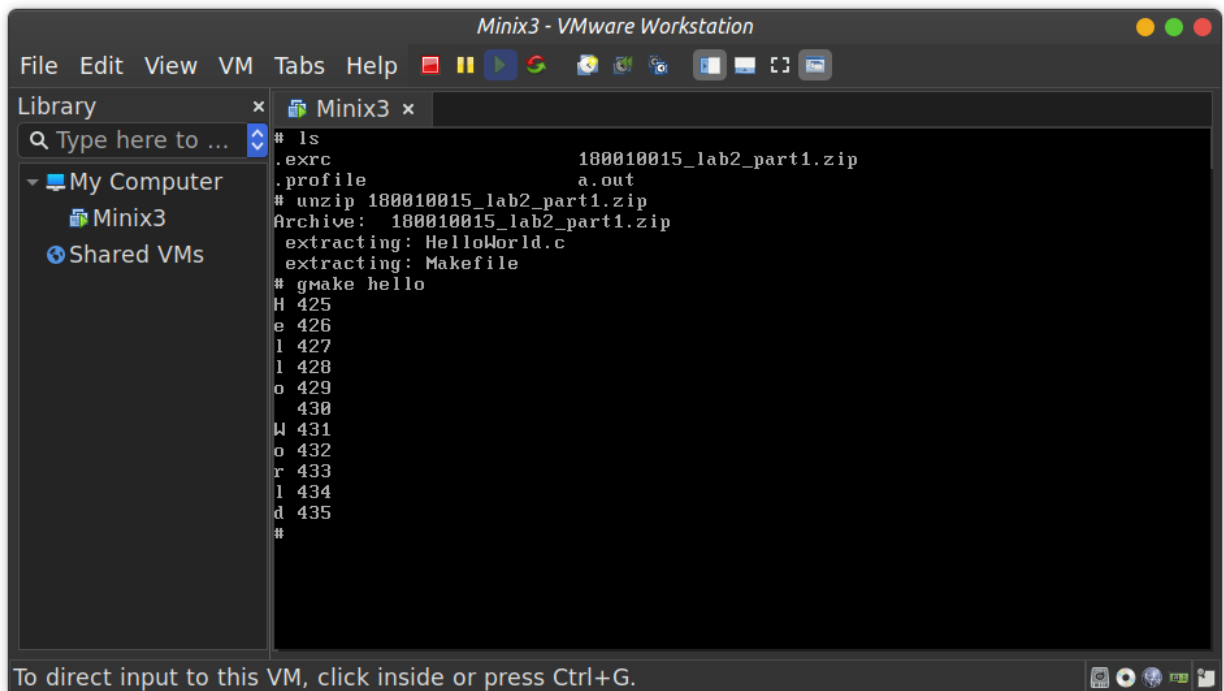
`sleep()` is another useful function from `unistd.h`, stops program execution for particular time limit

`rand()` selects random number.

A function to print 'hello world' is called with the string to be printed as argument, its length and index of char to print. Function verifies if the index is less than the string's length then creates a child process. Using id from fork, it checks if it is the parent process.

What is the minimum lines of C code with which you can achieve the above?

- For me C code was of around 27 lines. (it can be optimised)



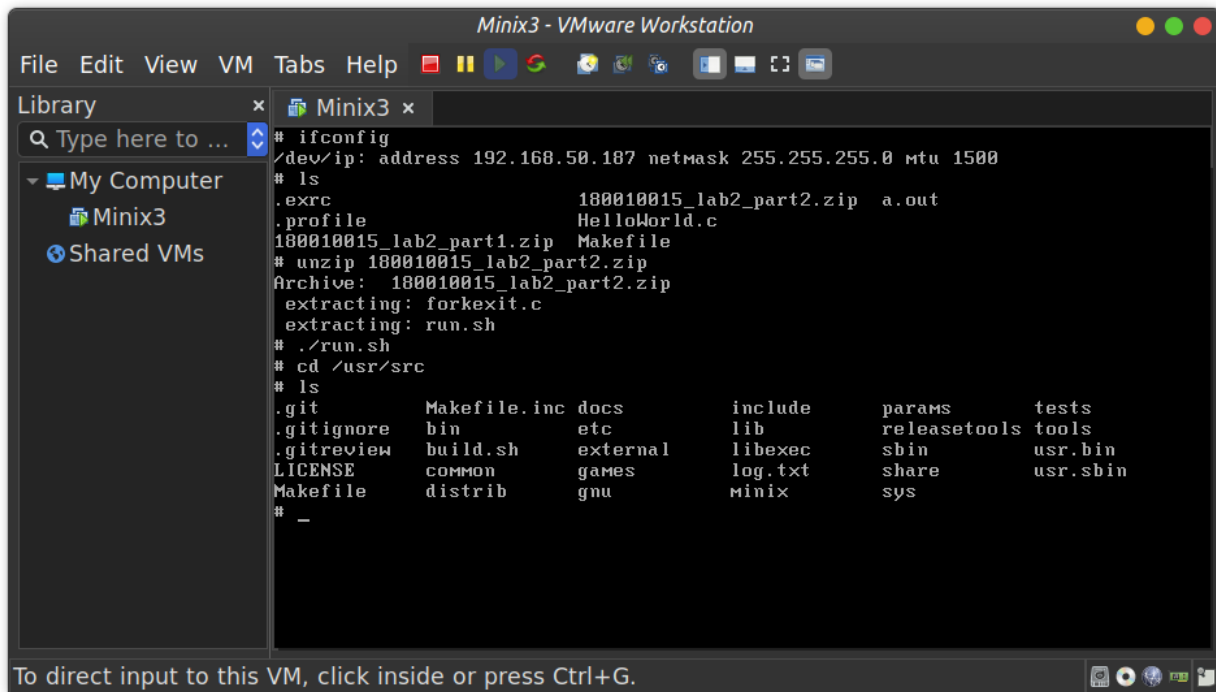
The screenshot shows a VMware Workstation window titled "Minix3 - VMware Workstation". The interface includes a menu bar (File, Edit, View, VM, Tabs, Help) and a toolbar. On the left, a "Library" pane shows "My Computer" with "Minix3" and "Shared VMs". The main terminal window, titled "Minix3 x", displays the following output:

```
# ls
.exrc                               180010015_lab2_part1.zip
.profile                            a.out
# unzip 180010015_lab2_part1.zip
Archive: 180010015_lab2_part1.zip
  extracting: HelloWorld.c
  extracting: Makefile
# gmake hello
H 425
e 426
l 427
l 428
o 429
  430
W 431
o 432
r 433
l 434
d 435
#
```

At the bottom of the window, a status bar reads: "To direct input to this VM, click inside or press Ctrl+G."

Part II :

```
# cp forkexit.c /usr/src/minix/servers/pm/forkexit.c
```

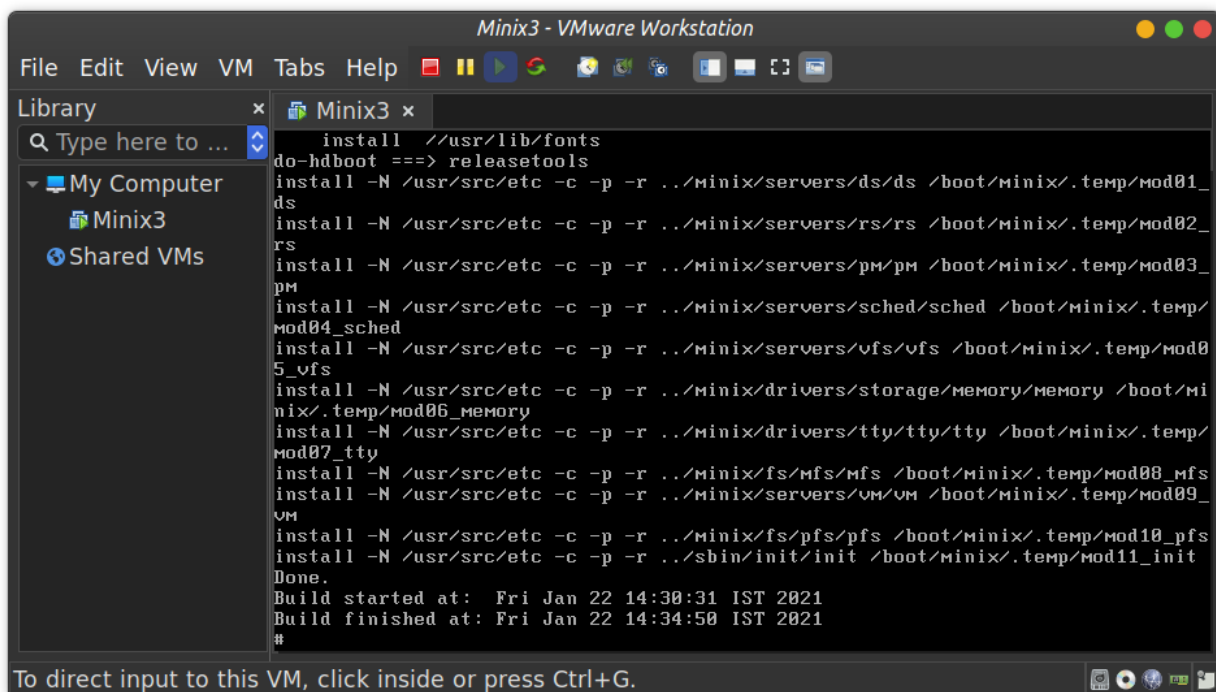


The screenshot shows a VMware Workstation window titled "Minix3 - VMware Workstation". The interface includes a menu bar (File, Edit, View, VM, Tabs, Help), a toolbar, and a sidebar with "Library" and "My Computer" sections. The "Minix3" VM is selected. The main terminal area displays the following commands and output:

```
# ifconfig
/dev/ip: address 192.168.50.187 netmask 255.255.255.0 mtu 1500
# ls
.exrc                  180010015_lab2_part2.zip  a.out
.profile              HelloWorld.c
180010015_lab2_part1.zip Makefile
# unzip 180010015_lab2_part2.zip
Archive: 180010015_lab2_part2.zip
  extracting: forkexit.c
  extracting: run.sh
# ./run.sh
# cd /usr/src
# ls
.git          Makefile.inc  docs          include       params        tests
.gitignore   bin          etc           lib           releasetools  tools
.gitreview   build.sh    external     libexec      sbin          usr.bin
LICENSE      common      games        log.txt      share         usr.sbin
Makefile     distrib    gnu          minix        sys
# _
```

At the bottom of the window, a message reads: "To direct input to this VM, click inside or press Ctrl+G."

```
# cd /usr/src && make build MKUPDATE=yes >log.txt 2>log.txt
# cat log.txt
```

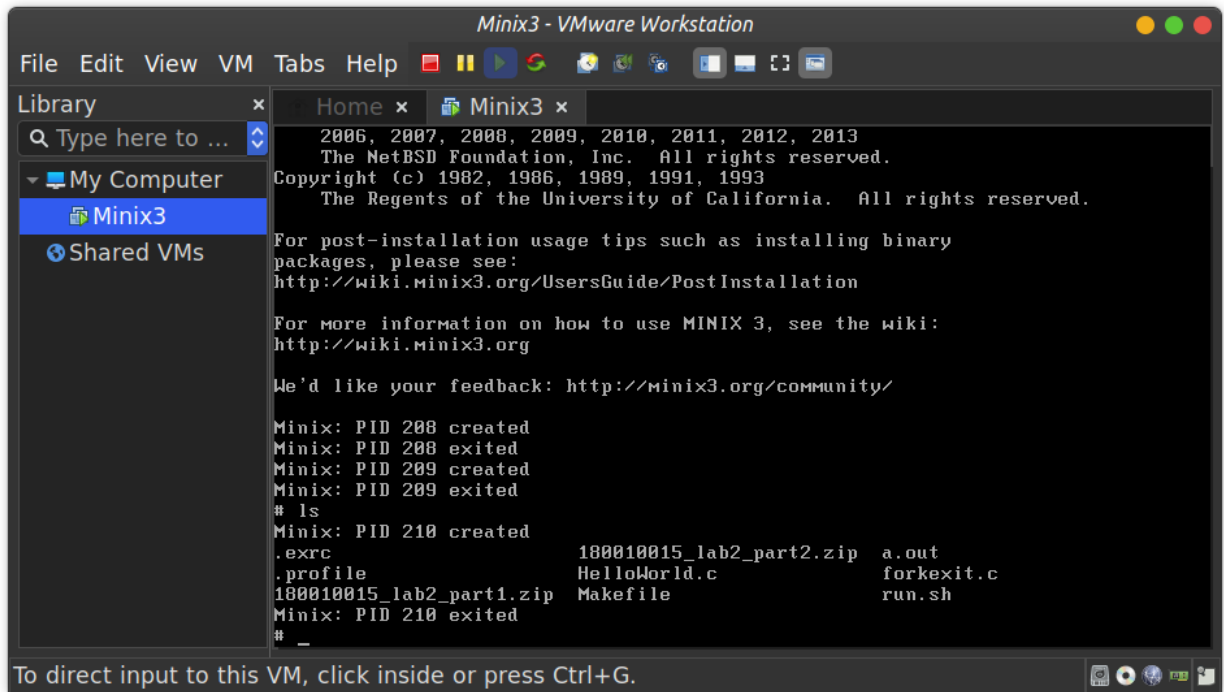


The screenshot shows the same Minix3 VM window. The terminal area displays the output of the build process:

```
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: Fri Jan 22 14:30:31 IST 2021
Build finished at: Fri Jan 22 14:34:50 IST 2021
#
```

At the bottom of the window, a message reads: "To direct input to this VM, click inside or press Ctrl+G."

reboot



Processes have 5 stages :

- Start
- Ready
- Running
- Waiting
- Terminated

Process creation is sequential, if PID - i was last created process, next will be with PID - i+1. First will be 'init' process & subsequent processes will be child processes. Exits of processes need not to be sequential.