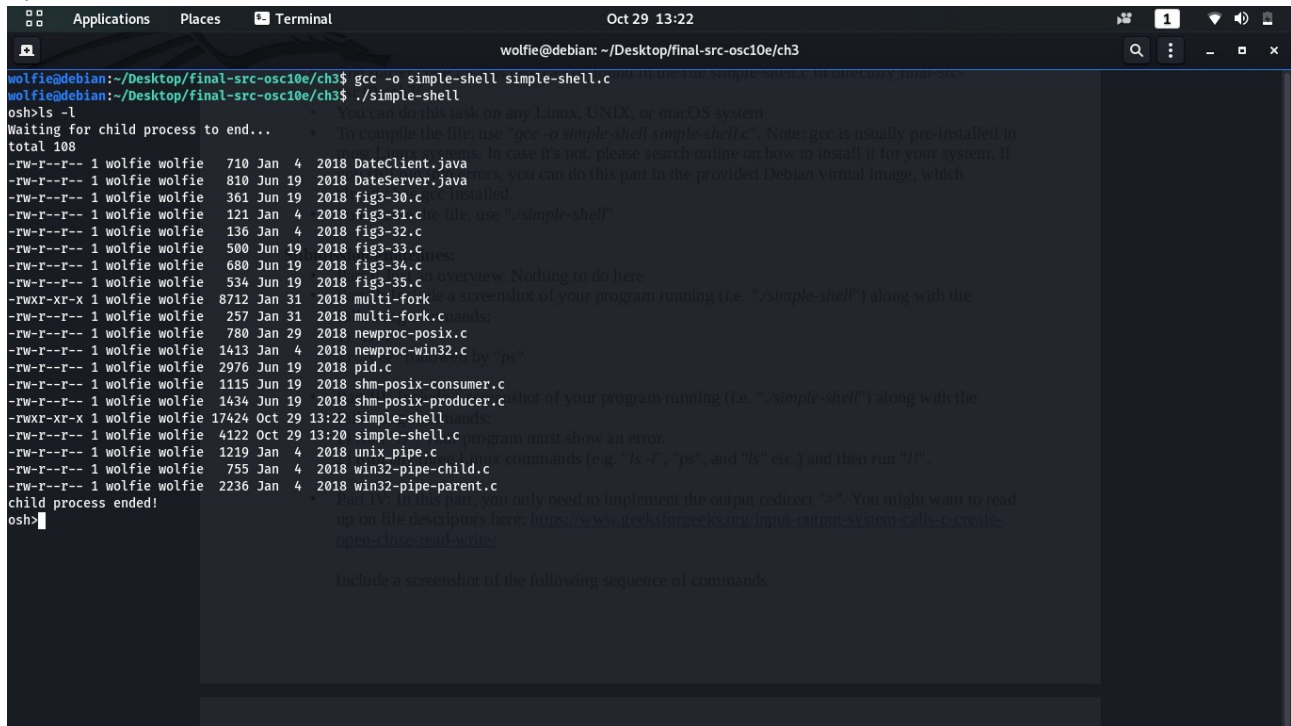


Project 1 —UNIX Shell:

Part II:

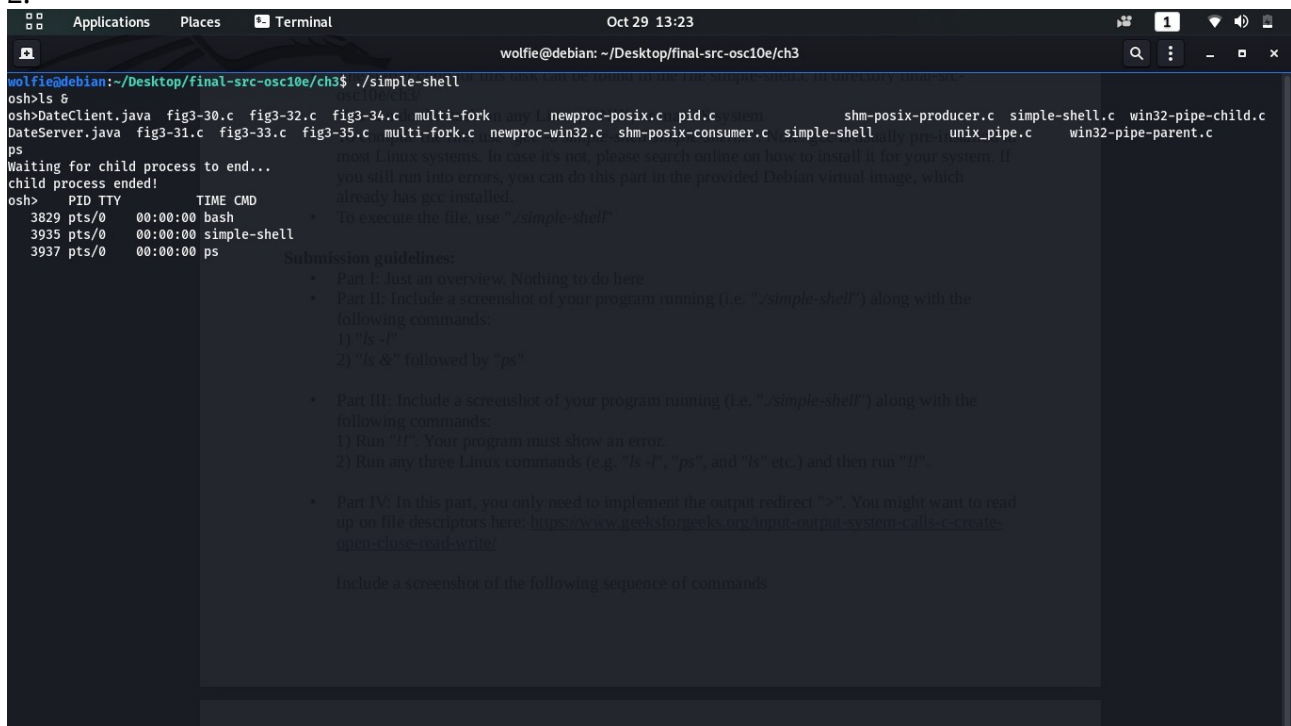
[screenshot]

1.



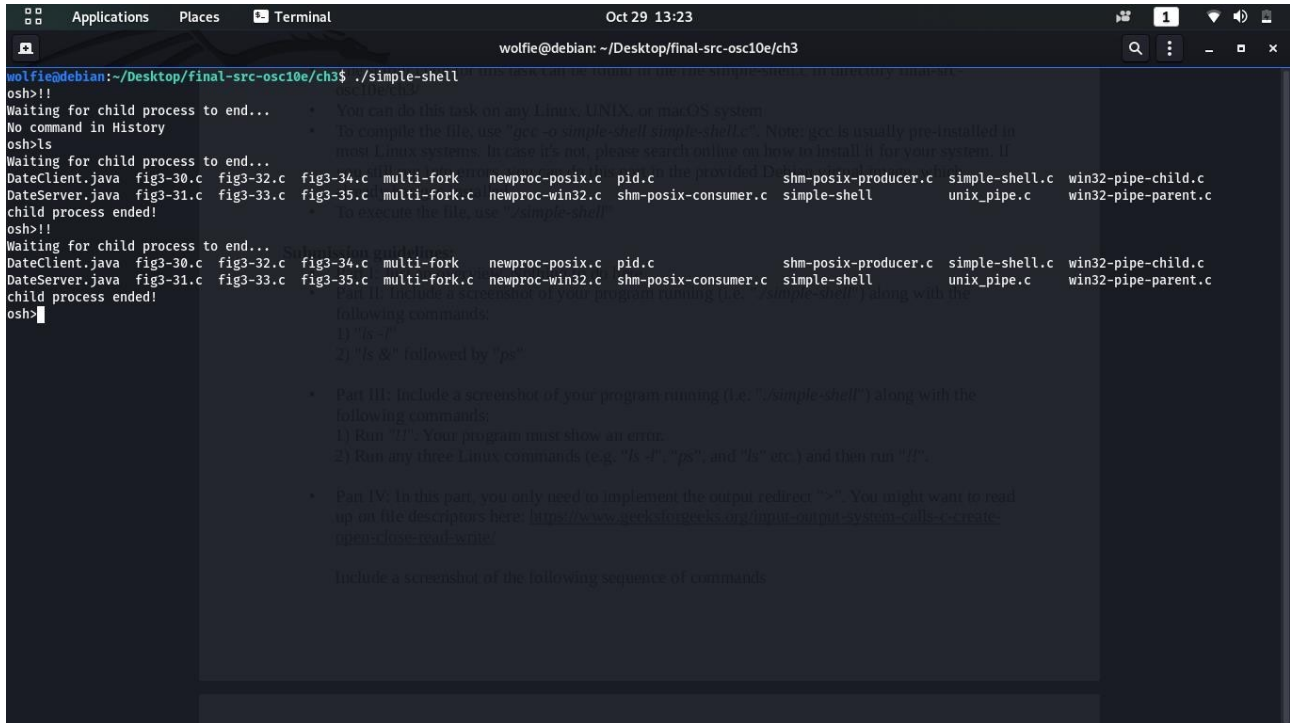
```
wolfie@debian: ~/Desktop/final-src-osc10e/ch3
wolfie@debian:~/Desktop/final-src-osc10e/ch3$ gcc -o simple-shell simple-shell.c
wolfie@debian:~/Desktop/final-src-osc10e/ch3$ ./simple-shell
osh>ls -l
total 108
-rw-r--r-- 1 wolfie wolfie 710 Jan 4 2018 DateClient.java
-rw-r--r-- 1 wolfie wolfie 810 Jun 19 2018 DateServer.java
-rw-r--r-- 1 wolfie wolfie 361 Jun 19 2018 fig3-30.c
-rw-r--r-- 1 wolfie wolfie 121 Jan 4 2018 fig3-31.c
-rw-r--r-- 1 wolfie wolfie 136 Jan 4 2018 fig3-32.c
-rw-r--r-- 1 wolfie wolfie 500 Jun 19 2018 fig3-33.c
-rw-r--r-- 1 wolfie wolfie 680 Jun 19 2018 fig3-34.c
-rw-r--r-- 1 wolfie wolfie 534 Jun 19 2018 fig3-35.c
-rwxr-xr-x 1 wolfie wolfie 8712 Jan 31 2018 multi-fork.c
-rw-r--r-- 1 wolfie wolfie 257 Jan 31 2018 multi-fork.c
-rw-r--r-- 1 wolfie wolfie 780 Jan 29 2018 newproc-posix.c
-rw-r--r-- 1 wolfie wolfie 1413 Jan 4 2018 newproc-win32.c
-rw-r--r-- 1 wolfie wolfie 2976 Jun 19 2018 pid.c
-rw-r--r-- 1 wolfie wolfie 1115 Jun 19 2018 shm-posix-consumer.c
-rw-r--r-- 1 wolfie wolfie 1434 Jun 19 2018 shm-posix-producer.c
-rwxr-xr-x 1 wolfie wolfie 17424 Oct 29 13:22 simple-shell.c
-rw-r--r-- 1 wolfie wolfie 4122 Oct 29 13:20 simple-shell.c
-rw-r--r-- 1 wolfie wolfie 1219 Jan 4 2018 unix_pipe.c
-rw-r--r-- 1 wolfie wolfie 755 Jan 4 2018 win32-pipe-child.c
-rw-r--r-- 1 wolfie wolfie 2236 Jan 4 2018 win32-pipe-parent.c
child process ended!
osh>
```

2.



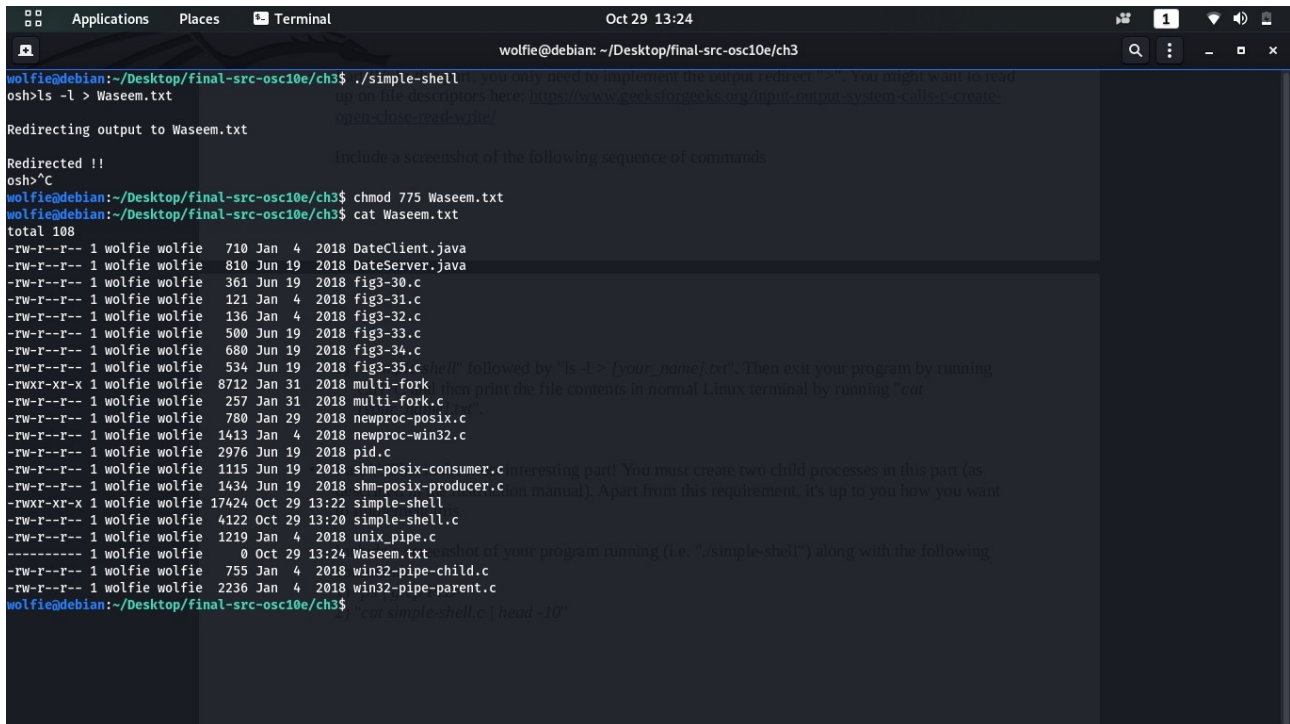
```
wolfie@debian: ~/Desktop/final-src-osc10e/ch3
wolfie@debian:~/Desktop/final-src-osc10e/ch3$ ./simple-shell
osh>ls -l
total 108
-rw-r--r-- 1 wolfie wolfie 710 Jan 4 2018 DateClient.java
-rw-r--r-- 1 wolfie wolfie 810 Jun 19 2018 DateServer.java
-rw-r--r-- 1 wolfie wolfie 361 Jun 19 2018 fig3-30.c
-rw-r--r-- 1 wolfie wolfie 121 Jan 4 2018 fig3-31.c
-rw-r--r-- 1 wolfie wolfie 136 Jan 4 2018 fig3-32.c
-rw-r--r-- 1 wolfie wolfie 500 Jun 19 2018 fig3-33.c
-rw-r--r-- 1 wolfie wolfie 680 Jun 19 2018 fig3-34.c
-rw-r--r-- 1 wolfie wolfie 534 Jun 19 2018 fig3-35.c
-rwxr-xr-x 1 wolfie wolfie 8712 Jan 31 2018 multi-fork.c
-rw-r--r-- 1 wolfie wolfie 257 Jan 31 2018 multi-fork.c
-rw-r--r-- 1 wolfie wolfie 780 Jan 29 2018 newproc-posix.c
-rw-r--r-- 1 wolfie wolfie 1413 Jan 4 2018 newproc-win32.c
-rw-r--r-- 1 wolfie wolfie 2976 Jun 19 2018 pid.c
-rw-r--r-- 1 wolfie wolfie 1115 Jun 19 2018 shm-posix-consumer.c
-rw-r--r-- 1 wolfie wolfie 1434 Jun 19 2018 shm-posix-producer.c
-rwxr-xr-x 1 wolfie wolfie 17424 Oct 29 13:22 simple-shell.c
-rw-r--r-- 1 wolfie wolfie 4122 Oct 29 13:20 simple-shell.c
-rw-r--r-- 1 wolfie wolfie 1219 Jan 4 2018 unix_pipe.c
-rw-r--r-- 1 wolfie wolfie 755 Jan 4 2018 win32-pipe-child.c
-rw-r--r-- 1 wolfie wolfie 2236 Jan 4 2018 win32-pipe-parent.c
child process ended!
osh>
```

Part III: [screenshot]



```
wolfie@debian: ~/Desktop/final-src-osc10e/ch3
osh>!!
Waiting for child process to end...
No command in History
osh>ls
Waiting for child process to end...
DateClient.java fig3-30.c fig3-32.c fig3-34.c multi-fork newproc-posix.c pid.c shm-posix-producer.c simple-shell.c win32-pipe-child.c
DateServer.java fig3-31.c fig3-33.c fig3-35.c multi-fork.c newproc-win32.c shm-posix-consumer.c simple-shell unix_pipe.c win32-pipe-parent.c
child process ended!
osh>!!
Waiting for child process to end...
DateClient.java fig3-30.c fig3-32.c fig3-34.c multi-fork newproc-posix.c pid.c shm-posix-producer.c simple-shell.c win32-pipe-child.c
DateServer.java fig3-31.c fig3-33.c fig3-35.c multi-fork.c newproc-win32.c shm-posix-consumer.c simple-shell unix_pipe.c win32-pipe-parent.c
child process ended!
osh>
```

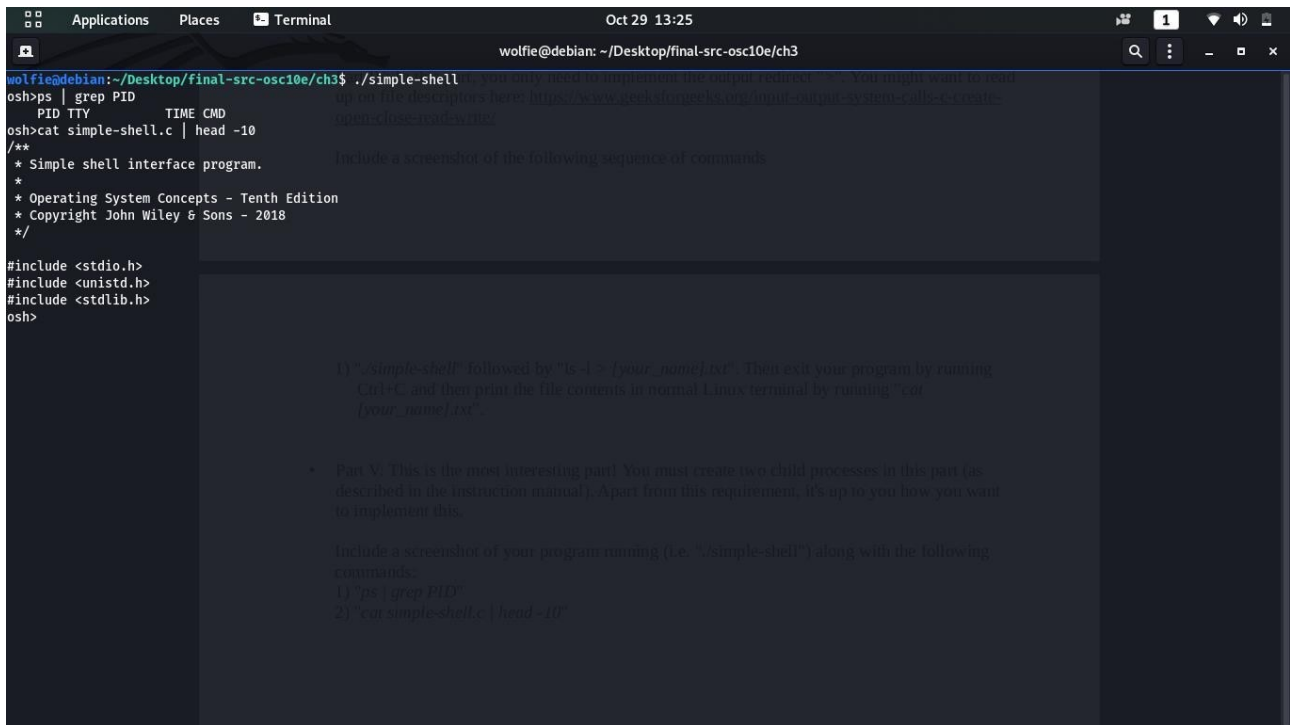
Part IV: [screenshot]



```
wolfie@debian: ~/Desktop/final-src-osc10e/ch3
osh>ls -l > Waseem.txt
Redirecting output to Waseem.txt
osh>^C
wolfie@debian:~/Desktop/final-src-osc10e/ch3$ chmod 775 Waseem.txt
wolfie@debian:~/Desktop/final-src-osc10e/ch3$ cat Waseem.txt
total 108
-rw-r--r-- 1 wolfie wolfie 710 Jan 4 2018 DateClient.java
-rw-r--r-- 1 wolfie wolfie 810 Jun 19 2018 DateServer.java
-rw-r--r-- 1 wolfie wolfie 361 Jun 19 2018 fig3-30.c
-rw-r--r-- 1 wolfie wolfie 121 Jan 4 2018 fig3-31.c
-rw-r--r-- 1 wolfie wolfie 136 Jan 4 2018 fig3-32.c
-rw-r--r-- 1 wolfie wolfie 500 Jun 19 2018 fig3-33.c
-rw-r--r-- 1 wolfie wolfie 680 Jun 19 2018 fig3-34.c
-rw-r--r-- 1 wolfie wolfie 534 Jun 19 2018 fig3-35.c
-rwxr-xr-x 1 wolfie wolfie 8712 Jan 31 2018 multi-fork
-rw-r--r-- 1 wolfie wolfie 257 Jan 31 2018 multi-fork.c
-rw-r--r-- 1 wolfie wolfie 780 Jan 29 2018 newproc-posix.c
-rw-r--r-- 1 wolfie wolfie 1413 Jan 4 2018 newproc-win32.c
-rw-r--r-- 1 wolfie wolfie 2976 Jun 19 2018 pid.c
-rw-r--r-- 1 wolfie wolfie 1115 Jun 19 2018 shm-posix-consumer.c
-rw-r--r-- 1 wolfie wolfie 1434 Jun 19 2018 shm-posix-producer.c
-rwxr-xr-x 1 wolfie wolfie 17424 Oct 29 13:22 simple-shell
-rw-r--r-- 1 wolfie wolfie 4122 Oct 29 13:20 simple-shell.c
-rw-r--r-- 1 wolfie wolfie 1219 Jan 4 2018 unix_pipe.c
----- 1 wolfie wolfie 0 Oct 29 13:24 Waseem.txt
-rw-r--r-- 1 wolfie wolfie 755 Jan 4 2018 win32-pipe-child.c
-rw-r--r-- 1 wolfie wolfie 2236 Jan 4 2018 win32-pipe-parent.c
wolfie@debian:~/Desktop/final-src-osc10e/ch3$ cat simple-shell.c | head -10
```

Part V:

[screenshot]



The screenshot shows a Linux terminal window with the title bar "Applications Places Terminal" and the date "Oct 29 13:25". The user is "wolfie@debian" and the current directory is "~/Desktop/final-src-osc10e/ch3". The terminal shows the execution of a program named "simple-shell" and its output.

```
wolfie@debian:~/Desktop/final-src-osc10e/ch3$ ./simple-shell
osh>ps | grep PID
PID TTY TIME CMD
osh>cat simple-shell.c | head -10
/**
 * Simple shell interface program.
 *
 * Operating System Concepts - Tenth Edition
 * Copyright John Wiley & Sons - 2018
 */

#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>
osh>
```

The output of the program is a list of instructions for the student to follow:

- 1) "Simple-shell" followed by "ls -l > [your_name].txt". Then exit your program by running Ctrl+C, and then print the file contents in normal Linux terminal by running "cat [your_name].txt".
- Part V: This is the most interesting part! You must create two child processes in this part (as described in the instruction manual). Apart from this requirement, it's up to you how you want to implement this.

The instructions also include a screenshot of the program running (i.e. "simple-shell") along with the following commands:

- 1) "ps | grep PID"
- 2) "cat simple-shell.c | head -10"