OS Lab 2

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CS20B046

Problem statement 1 →

XV6 installation →
1. sudo apt-get update
2. sudo apt-get install qemu qemu-system-x86
3. sudo apt-get install libc6-dev:i386
4. git clone https://github.com/mit-pdos/xv6-public.git xv6
5. chmod 700-R xv6
6. cd xv6
7. make qemu

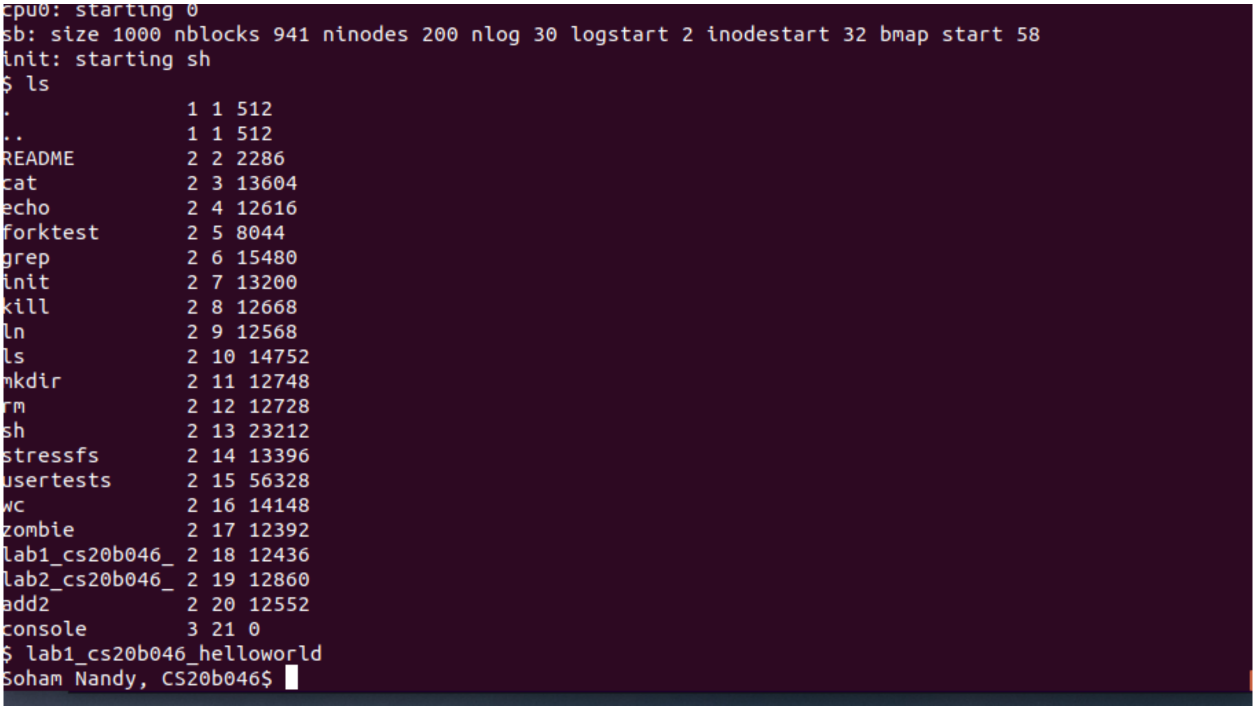
Challenges Faced →
1. While running make qemu → got a warning stating you either need to remov eall instances of user.h or add a tag to it

Firing the Qemu terminal
1. Simply type make qemu will fire up the terminal

Creating and Running a hello world program
1. Inside the xv6 directory write the program
2. Edit the Makefile adding lab1_cs20b036_`helloworld.c\ in`

```
mkfs.c ulib.c user.h cat.c echo.c forktest.c grep.c
kill.c\
ln.c ls.c mkdir.c rm.c stressfs.c usertests.c wc.c
zombie.c\
helloworld.c\
printf.c umalloc.c\
README dot-bochsrc *.pl toc.* runoff runoff1
runoff.list\
.gdbinit.tmpl gdbutil\
```

3. Type make clean
4. Type make
5. The qemu terminal will pop up showing the output



```
cpu0: starting 0
sb: size 1000 nblocks 941 ninodes 200 nlog 30 logstart 2 inodestart 32 bmap start 58
init: starting sh
$ ls
.              1 1 512
..             1 1 512
README         2 2 2286
cat            2 3 13604
echo           2 4 12616
forktest       2 5 8044
grep           2 6 15480
init           2 7 13200
kill           2 8 12668
ln             2 9 12568
ls             2 10 14752
mkdir          2 11 12748
rm             2 12 12728
sh             2 13 23212
stressfs       2 14 13396
usertests      2 15 56328
wc             2 16 14148
zombie         2 17 12392
lab1_cs20b046_ 2 18 12436
lab2_cs20b046_ 2 19 12860
add2           2 20 12552
console        3 21 0
$ lab1_cs20b046_helloworld
Soham Nandy, CS20b046$ 
```

Problem Statement 2 →

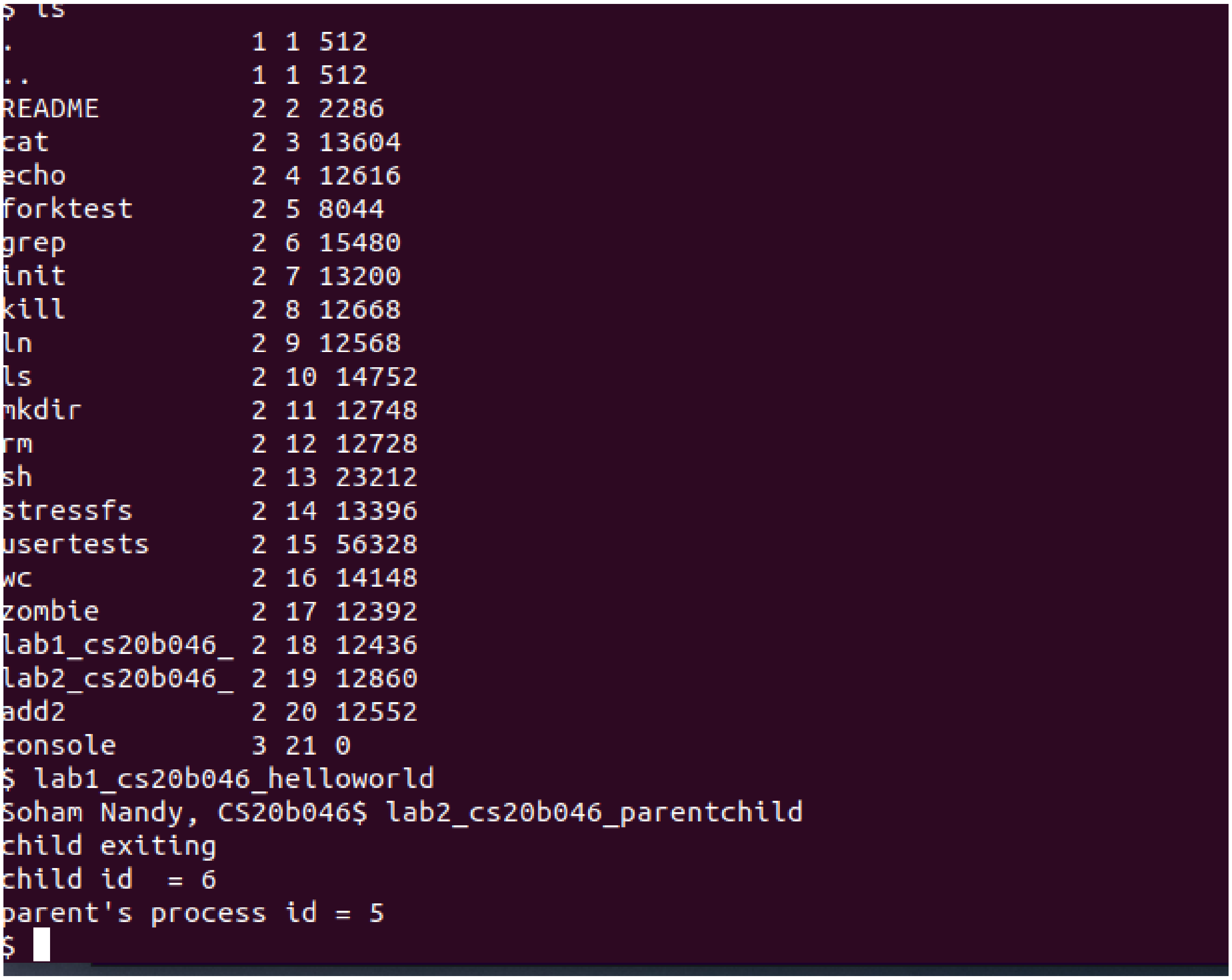
Steps

- Creating file lab2_cs20b046_parentchild.c
- Execute it using the standard Makefile

Challenges faced->

- **Issue 1** → Initially understanding the problem statement
- **Issue 2** → Struggled in putting getpid and getppid()
- **Issue 3** →getpid() worked but getppid() didn't

Final output→



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wc             2 16 14148
zombie         2 17 12392
lab1_cs20b046_ 2 18 12436
lab2_cs20b046_ 2 19 12860
add2           2 20 12552
console        3 21 0
$ lab1_cs20b046_helloworld
Soham Nandy, CS20b046$ lab2_cs20b046_parentchild
child exiting
child id  = 6
parent's process id = 5
$ 
```

Problem Statement 3→

Steps

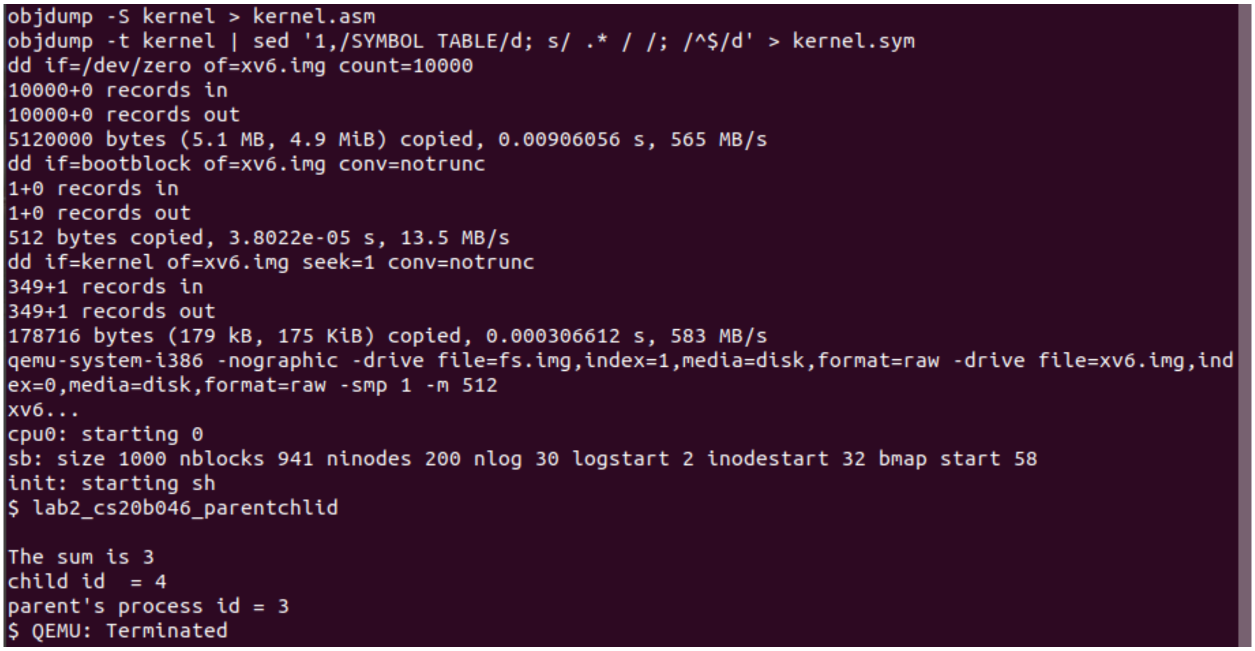
- Write a file add2.c which incorporates addition of 2 numbers
- Call this function for lab2_cs20b046_parentchild.c in the child process

Challenges faced

- **Issue 1 ->** Scanf utility in xv6 not found
- **Issue 2** → Couldn’t find the path to be put in the exec(<path>, arg) command
- **Issue 2** → Couldn’t link the exection

All Issues resolved finally

Final result→



```
objdump -S kernel > kernel.asm
objdump -t kernel | sed '1,/SYMBOL TABLE/d; s/ .* / /; /^$/d' > kernel.sym
dd if=/dev/zero of=xv6.img count=10000
10000+0 records in
10000+0 records out
5120000 bytes (5.1 MB, 4.9 MiB) copied, 0.00906056 s, 565 MB/s
dd if=bootblock of=xv6.img conv=notrunc
1+0 records in
1+0 records out
512 bytes copied, 3.8022e-05 s, 13.5 MB/s
dd if=kernel of=xv6.img seek=1 conv=notrunc
349+1 records in
349+1 records out
178716 bytes (179 kB, 175 KiB) copied, 0.000306612 s, 583 MB/s
qemu-system-i386 -nographic -drive file=fs.img,index=1,media=disk,format=raw -drive file=xv6.img,ind
ex=0,media=disk,format=raw -smp 1 -m 512
xv6...
cpu0: starting 0
sb: size 1000 nblocks 941 ninodes 200 nlog 30 logstart 2 inodestart 32 bmap start 58
init: starting sh
$ lab2_cs20b046_parentchlid

The sum is 3
child id  = 4
parent's process id = 3
$ QEMU: Terminated
```