

# Report for CS344 Assignment-1

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## Q1.

The 5 files which were edited to add the system call are:-

- a) We will firstly change the syscall.h file where every system call is being assigned a particular number and as the system already has 21 system calls we will give our system call the number 22. So we add this line of code in syscall.h:

**#define SYS\_draw 22**

- b) Now we do the changes in the syscall.c file. This file has an array of function pointers(\*syscalls[ ]) which points to different system calls and it uses the indices defined in syscall.h file to point to the corresponding system call. We add this line of code in syscall.c at the appropriate index:

**[SYS\_draw] sys\_draw,**

Now we add a prototype of the system call function which we will be implementing in the sysproc.c file. So we add this line of code to declare the function prototype in syscall.c:

**extern int sys\_draw(void);**

- c) Now we implement the sys\_draw function in the sysproc.c file. Details of the code are provided in the code itself using comments at appropriate locations.
- d) Now we add a system call definition of the system call function at the user level in the usys.S file. This connects the user's program's call to the system's call function. We add this line of code:

**SYSCALL(draw)**

- e) Now finally we add the function prototype at the user level in user.h by adding this line of code:

**int draw(void\*, uint);**

## Q2.

Now we will add a user program Drawtest.c to call the system call. We add it in the xv6 directory. Details of the code are provided in the code itself using comments at appropriate locations.

Now we edit our MakeFile: We add our new C program under the UPROGS and EXTRA list.

Now we do **make clean**, **make** and **make qemu**.

We run ls and Drawtest to see the following outputs:-

```
$ ls
.          1 1 512
..         1 1 512
README    2 2 2286
cat        2 3 16268
echo       2 4 15120
forktest   2 5 9432
grep       2 6 18488
init       2 7 15708
kill       2 8 15148
ln         2 9 15004
ls         2 10 17632
mkdir     2 11 15248
rm         2 12 15224
sh         2 13 27860
stressfs   2 14 16140
usertests  2 15 67244
wc         2 16 17000
zombie     2 17 14816
Drawtest   2 18 15280
console    3 19 0
$ █
```

Fig 2.1: Showing the ls command in the xv6's shell command prompt to see the fs.img file's content

```
$ Drawtest

      ,ood8888booo,
    ,od8      8bo,
  ,od      bo,
,od8      8b,
,o      o,      ,a8b
,8      8,,od8  8
8'      d8'  8b
8      d8'ba  aP'
Y,      o8'   aP'
Y8,      YaaaP' ba
Y8o      Y8'   88
`Y8      ,8"   `P
      Y8o      ba
      oood888888P""",d8P',8"
      ,od      8
      ,dP      o88o
      ,dP      8
      ,d'      oo      8
$      d$"8      8
d      d d8      od  ""boooooooooob  d"" 8
$      8 d      ood' , 8      b 8  '8 b
$      $ 8 8      d d8      `b d  '8 b
$      $ 8 b      Y d8      8 ,P  '8 b
`$$      Yb b      8b 8b      8 8,  '8 o,
      `Y b      8o $$o      d b      b $o
      8      '$      8$,,$"      $ $o      'so$$
      $o$$P"      $$o$
```

Fig 2.2: Showing the ascii art image formed by calling Drawtest.