

## Assignment 1 : OS Laboratory

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### Exercise 1:

We have created a system call which copies the given wolfie.txt (ASCII image). Given that the buffer is large enough. If the call succeeds, we return the number of bytes copied, else return a negative value(i.e., -1) which implies not valid.

The following are significant changes we made to create the system call we want.

- **sysproc.c** : A function **int sys\_wolfie(void)** is implemented.
- **syscall.h** : It defines the position of system call vector(i.e., 22) which corresponds to the sys\_wolfie in the whole implementation.
- **syscall.c** : **extern int sys\_wolfie(void);** connects the shell and kernel, and the system call function was added to the system call vector at the specified position in the syscall.h .
- **user.h** : Includes the system call **int wolfie(void \*buf,uint size);** in the user header file to copy the **wolfie.txt** image.
- **usys.s** : Creates a user level system call definition for the system call sys\_wolfie to connect user's call to the the system call function.

### Exercise 2:

A file **Drawtest.c** was created that gets the image from the kernel, and prints it to the console if the buffer is large enough, else prints an error message.

- **Makefile** is edited so that includes just an extra line **\_Drawtest\** in the **UPROGS**(user programs) part in the **Makefile**.
- And then we do **make clean** in xv6-public directory and **make** again. Now we run make qemu to see the image of **wolfie.txt** .
- Now we run **ls** to see the contents **fs.img** and then execute **Drawtest** in the xv6 shell's commnad prompt to get the wolfie image form kernel to print it to the console.

```
init: starting sh
$ ls
.          1 1 512
..         1 1 512
README    2 2 2286
cat        2 3 16272
echo      2 4 15124
forktest  2 5 9440
grep       2 6 18492
init       2 7 15712
kill       2 8 15152
ln         2 9 15012
ls         2 10 17640
mkdir      2 11 15256
rm         2 12 15232
sh         2 13 27868
stressfs   2 14 16144
usertests  2 15 67252
wc         2 16 17008
zombie     2 17 14824
Drawtest   2 18 15240
console    3 19 0
```

ls

```
$ Drawtest
      ,ood8888b0oo,
     ,od8          8bo,
    ,od           ,bo,
   ,d8           ,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       `Y8"  `p
Y8o      ,d8P'  ba
          ,8"   p'
ooooo8888888P""",
     ,dp,od     o88o
    ,dp,od      8
   ,d' oo       8
$ d$"8 8      Y Y o 8
d d d8 od ""b0oooooob d"" 8 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 '8 $o
8 '$ 8$,,$" $ $o '$o$$
$oS$P" $So$
```

wolfie