Assignment 0B
OS344 - Operating Systems Laboratory

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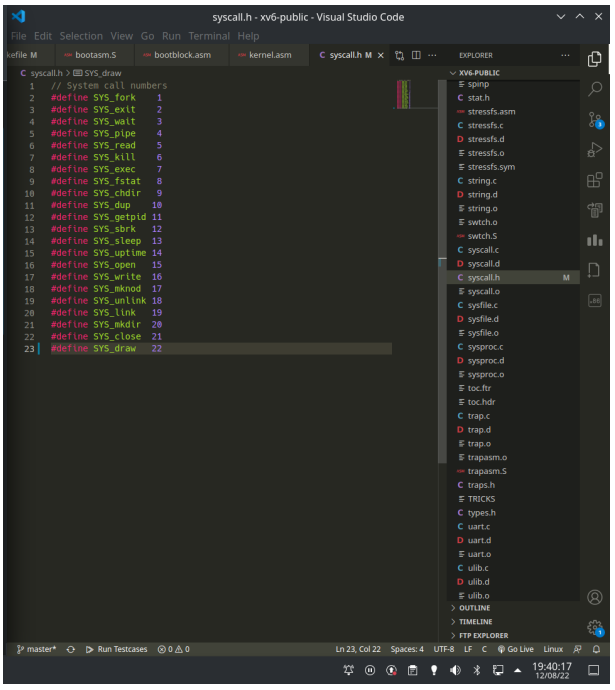
Assignment 0B:- Adding a system call
Exercise 1:
In order to create our own system call sys_draw we will need to change 5 files as follows:

1) syscall.h
2) syscall.c
3) sysproc.c
4) usys.S
5) user.h

Now I started with syscall.h, we can see that there are already 21 system calls, so I added the 22nd call sys_draw using the following command:

```
#define SYS_draw    22
```

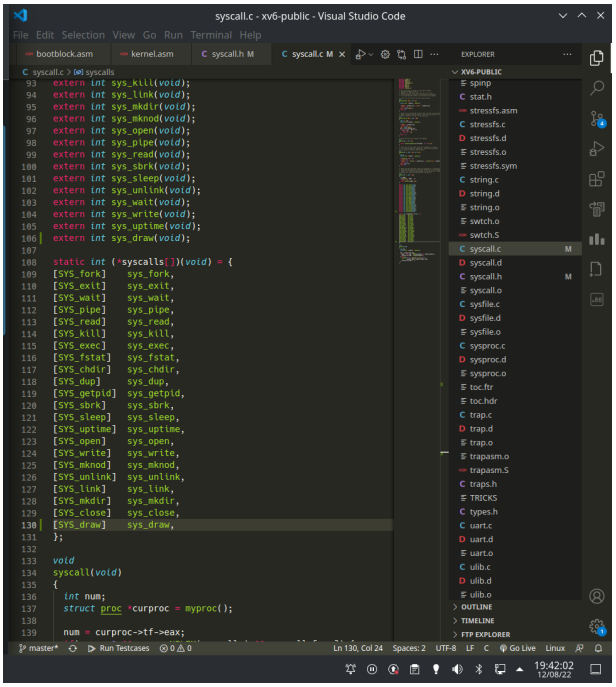


Now we need to add a pointer to the system call in the syscall.c file. The file contains an array of function pointers. In order to add the sys_draw call, I added the following line in the pointer list:

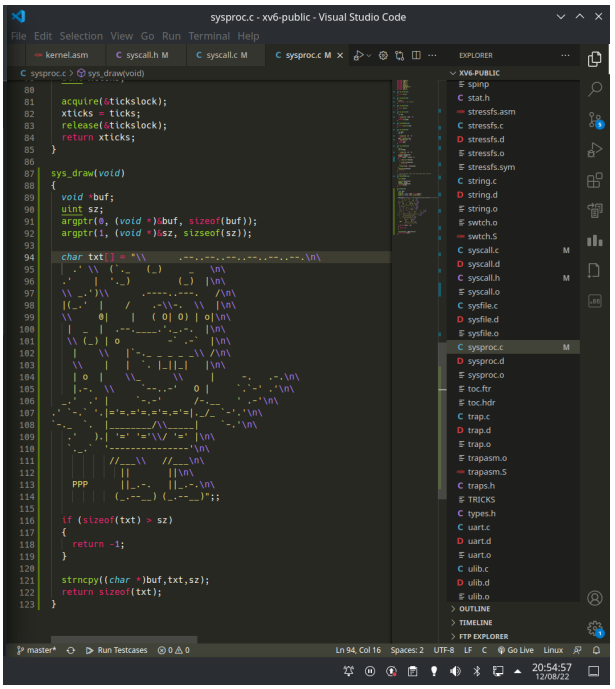
```
[SYS_draw]    sys_draw,
```

Also we need to add prototype of the function as we will define it in sysproc.c file we will just declare it here in syscall.c file using the following command:

```
extern int sys_draw(void);
```

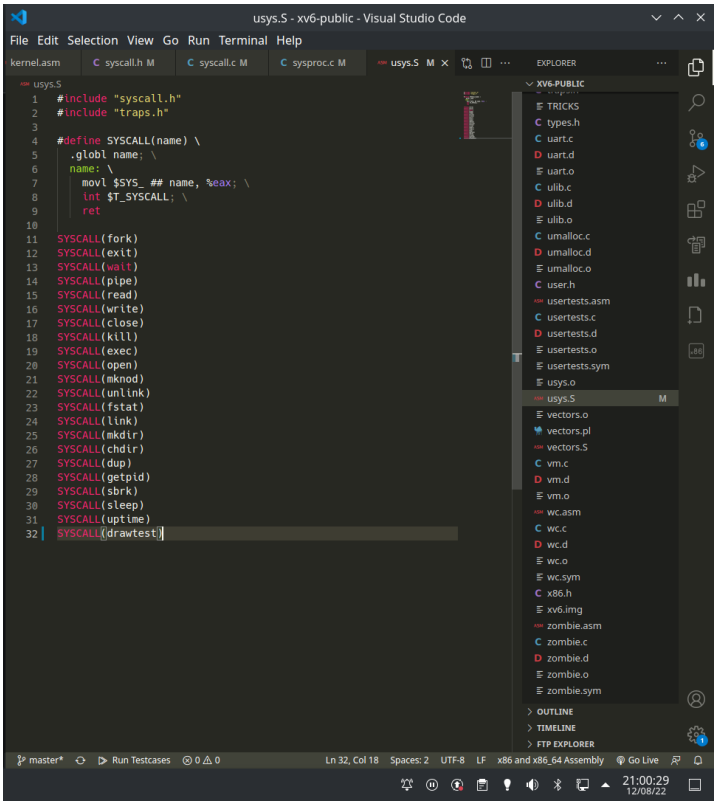


Now we define our system call sys_draw in the sysproc.c file which can be seen in the below figure.



Now to facilitate the user to use the system call we will add an interface using the following line in usys.S :

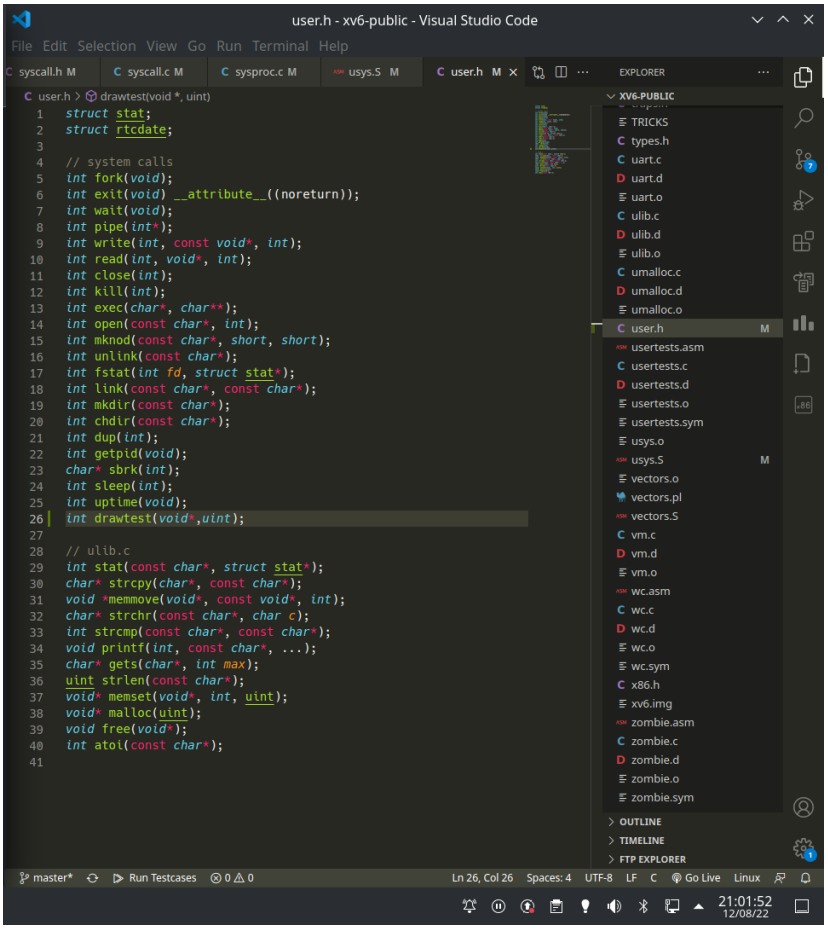
```
SYSCALL(draw)
```



and also line

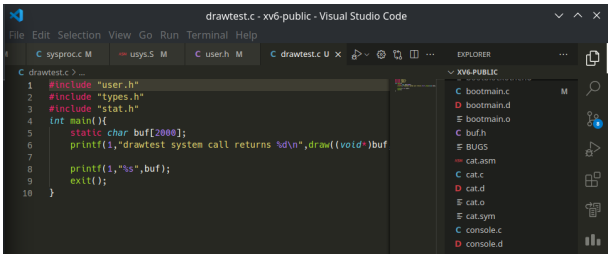
```
int draw(void*,uint);
```

In user.h



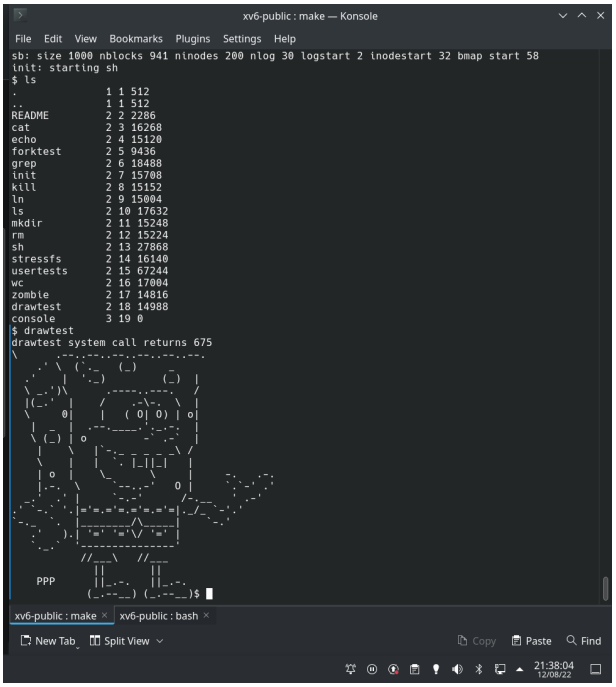
Exercise 2:

Now I wrote a user program drawtest.c inside the xv6-public folder which will call the sys_draw system call.



After writing the code I added drawtest.c file to Makefile under UPROGS and EXTRA.

Then I used “make clean”, “make”, “make qemu” and then entered ls to check whether it is showing my file and indeed it does. We can see in the below image the second last file. Then I entered drawtest to get the spongebob as can be seen below.


xv6-public : make — Konsole
File Edit View Bookmarks Plugins Settings Help
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 16268
echo 2 4 15120
forktest 2 5 9436
grep 2 6 18488
init 2 7 15708
kill 2 8 15152
ln 2 9 15004
ls 2 10 17632
mkdir 2 11 15248
rm 2 12 15224
sh 2 13 27868
stressfs 2 14 16140
usertests 2 15 67244
wc 2 16 17004
zombie 2 17 14816
drawtest 2 18 14988
console 3 19 0
$ drawtest
drawtest system call returns 675
PPP
$
xv6-public : make
xv6-public : bash
New Tab
Split View
Copy
Paste
Find
21:38:04
12/08/22