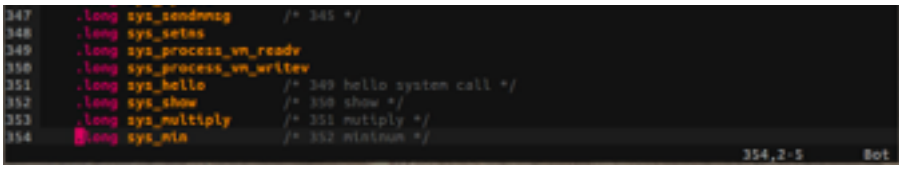
Operating System Project 1

1. Edit the source code and Makefile

Add system calls to system call table

```
$ sudo vim /usr/src/linux-3.2.54/arch/x86/kernel/syscall_table_32.S
```

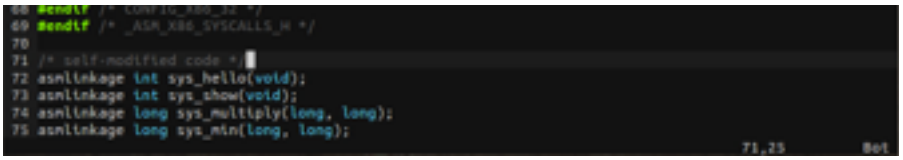


Add macros

```
$ sudo vim /usr/src/linux-3.2.54/arch/x86/include/asm/unistd_32.h
```

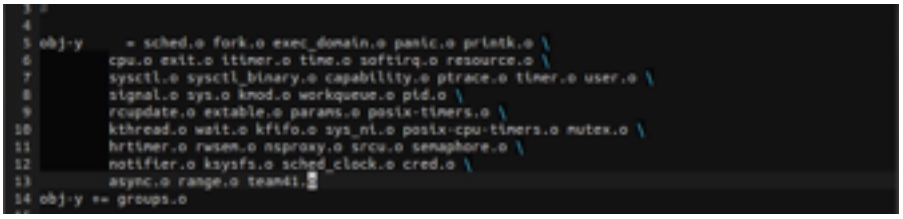
Add system call functions declaration

```
$ sudo vim /usr/src/linux-3.2.54/arch/x86/include/asm/syscalls.h
```

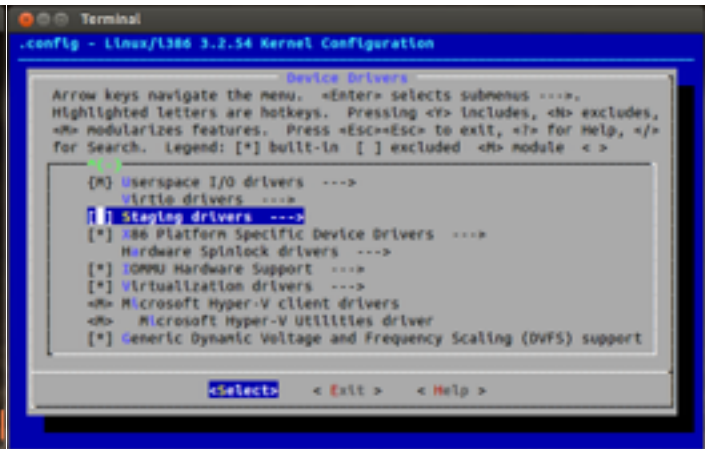


Add source code to making target

```
$ sudo vim /usr/src/linux-3.2.54/kernel/Makefile
```



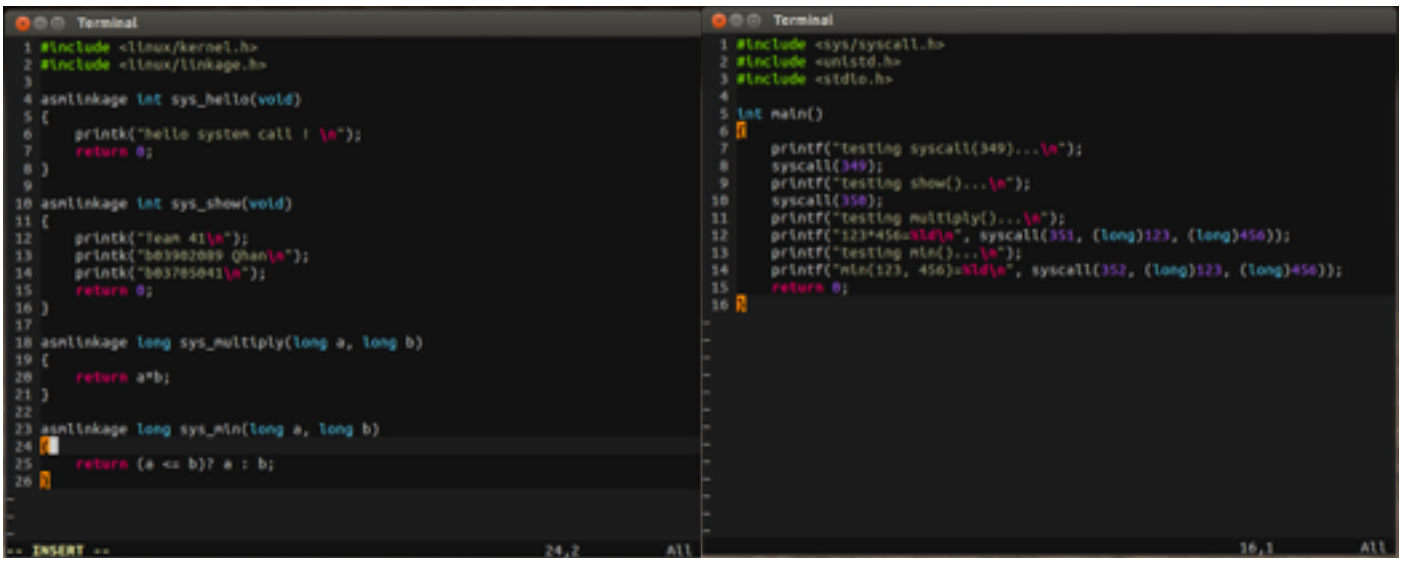
2. Problems during making modules



solutions : unable the to make the modules of staging during “sudo make menuconfig”

reference : http://forum.ubuntu.org.cn/viewtopic.php?f=97&t=361214

3. The source code we created : team41.c & The testing program : test.c

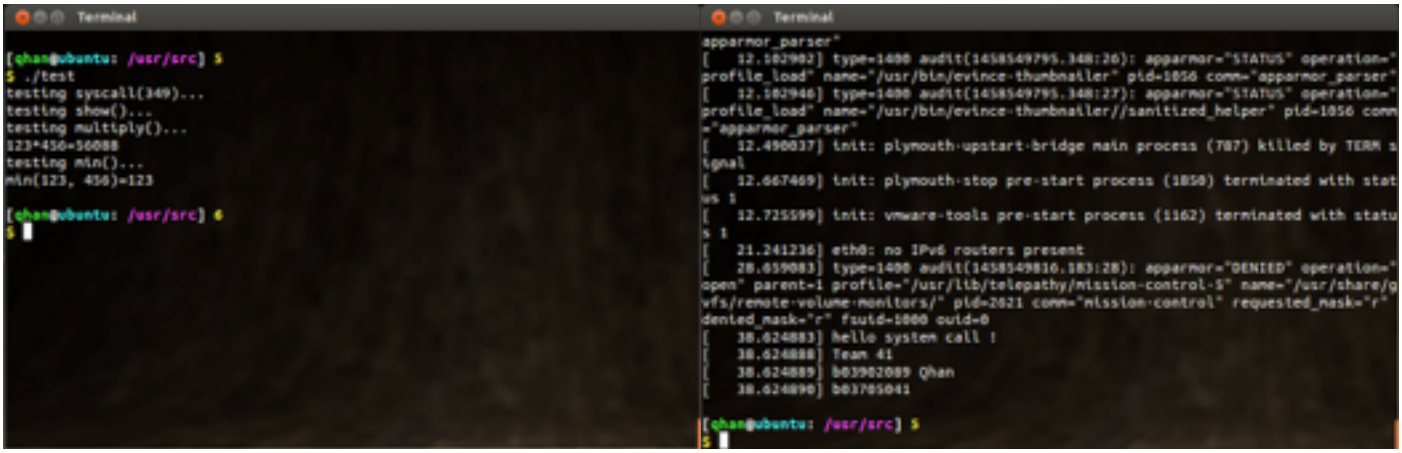


```
#include <linux/kernel.h>
#include <linux/linkage.h>

asmlinkage int sys_hello(void)
{
    printk("hello system call ! \n");
    return 0;
}

asmlinkage int sys_show(void)
{
    printk("Team 41\n");
    printk("b03902089 Qhan\n");
    printk("b03705041\n");
    return 0;
}

asmlinkage long sys_multiply(long a, long b)
{
    return a*b;
}

asmlinkage long sys_min(long a, long b)
{
    return (a <= b)? a : b;
}
```

```
#include <sys/syscall.h>
#include <unistd.h>
#include <stdio.h>

int main()
{
    printf("testing syscall(349)...\n");
    syscall(349);
    printf("testing show()...\n");
    syscall(350);
    printf("testing multiply()...\n");
    printf("123*456=%ld\n", syscall(351, (long)123, (long)456));
    printf("testing min()...\n");
    printf("min(123, 456)=%ld\n", syscall(352, (long)123, (long)456));
    return 0;
}
```

4. Testing result

```
$ sudo gcc /usr/src/test.c -o test
$ ./test
$ dmesg
```



```
[qhan@ubuntu: /usr/src] $
$ ./test
testing syscall(349)...
testing show()...
testing multiply()...
123*456=56088
testing min()...
min(123, 456)=123

[qhan@ubuntu: /usr/src] 0
$
```

```
apparmor_parser"
[   12.102982] type=1400 audit(1458549795.348:26): apparmor="STATUS" operation="
profile_load" name="/usr/bin/evince-thumbnailer" pid=1056 comm="apparmor_parser"
[   12.102946] type=1400 audit(1458549795.348:27): apparmor="STATUS" operation="
profile_load" name="/usr/bin/evince-thumbnailer//sanitized_helper" pid=1056 comm
="apparmor_parser"
[   12.490037] init: plymouth-upstart-bridge main process (787) killed by TERM s
ignal
[   12.667469] init: plymouth-stop pre-start process (1050) terminated with stat
us 1
[   12.725599] init: vmware-tools pre-start process (1162) terminated with statu
s 1
[   21.241236] eth0: no IPv6 routers present
[   28.059083] type=1400 audit(1458549810.183:28): apparmor="DENIED" operation="
open" parent=1 profile="/usr/lib/telepathy/mission-control-5" name="/usr/share/g
vfs/remote-volume-monitors/" pid=2021 comm="mission-control" requested_mask="r"
denied_mask="r" fsuid=1000 ouid=0
[   38.624883] hello system call !
[   38.624888] Team 41
[   38.624889] b03902089 Qhan
[   38.624890] b03705041

[qhan@ubuntu: /usr/src] $
$
```