

## Template Final Exam

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Link to the repository: <https://github.com/ImangaliK/ImangaliK>

## Task 1:

Screenshots of the code compilation result:

```
root@kali: /home/kali
File Actions Edit View Help
(kali@kali)-[~]
$ root
Command 'root' not found, did you mean:
command 'proot' from deb proot
command 'foot' from deb foot
command 'toot' from deb toot
command 'rootv' from deb xawtv
Try: sudo apt install <deb name>

(kali@kali)-[~]
$ sudo su
[sudo] password for kali:
(root@kali)-[/home/kali]
# useradd student

(root@kali)-[/home/kali]
# passwd student
New password:
Retype new password:
passwd: password updated successfully

(root@kali)-[/home/kali]
# login student
Password:
Linux kali 5.15.0-kali3-amd64 #1 SMP Debian 5.15.15-2kali1 (2022-01-31) x86_64

The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
No directory, logging in with HOME=/
$
```

```
(root@kali)-[/home/kali]
# login student
Password:
Linux kali 5.15.0-kali3-amd64 #1 SMP Debian 5.15.15-2kali1 (2022-01-31) x86_64

The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
No directory, logging in with HOME=/
$ whoami
student
$
```

## Task 2:

Screenshots of the code compilation result:

"Direct" IP connection to the Internet

```
(root@kali)-[/home/kali]
# VBoxManage modifyvm kali --nic1 bridged --bridgeadapter1 eth0
Command 'VBoxManage' not found, but can be installed with:
apt install virtualbox
Do you want to install it? (N/y)y
apt install virtualbox

...

(root@kali)-[/home/kali]
# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.4 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::a00:27ff:fe95:bd54 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:95:bd:54 txqueuelen 1000 (Ethernet)
    RX packets 3 bytes 1240 (1.2 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 17 bytes 1774 (1.7 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
(root@kali)-[/home/kali]
# ifconfig eth0 10.0.2.4 netmask 255.255.255.0

(root@kali)-[/home/kali]
# ip route
default via 10.0.2.1 dev eth0 proto dhcp metric 100
10.0.2.0/24 dev eth0 proto kernel scope link src 10.0.2.4 metric 100

(root@kali)-[/home/kali]
# route add default gw 10.0.2.1 eth0

(root@kali)-[/home/kali]
# cat /etc/resolv.conf
# Generated by NetworkManager
nameserver 192.168.1.1

(root@kali)-[/home/kali]
#

(root@kali)-[/home/kali]
# echo "nameserver 192.168.1.1" >> /etc/resolv.conf

(root@kali)-[/home/kali]
# ping google.com
PING google.com (216.58.207.206) 56(84) bytes of data.
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=1 ttl=57 time=89.9 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=2 ttl=57 time=91.8 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=3 ttl=57 time=87.4 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=4 ttl=57 time=87.7 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=5 ttl=57 time=87.5 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=6 ttl=57 time=90.8 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=7 ttl=57 time=88.0 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=8 ttl=57 time=108 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=9 ttl=57 time=87.7 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=10 ttl=57 time=90.5 ms
64 bytes from arn11s04-in-f14.1e100.net (216.58.207.206): icmp_seq=11 ttl=57 time=89.3 ms
^C
  google.com ping statistics
  11 packets transmitted, 11 received, 0% packet loss, time 10060ms
  rtt min/avg/max/mdev = 87.415/90.748/107.720/5.562 ms
```

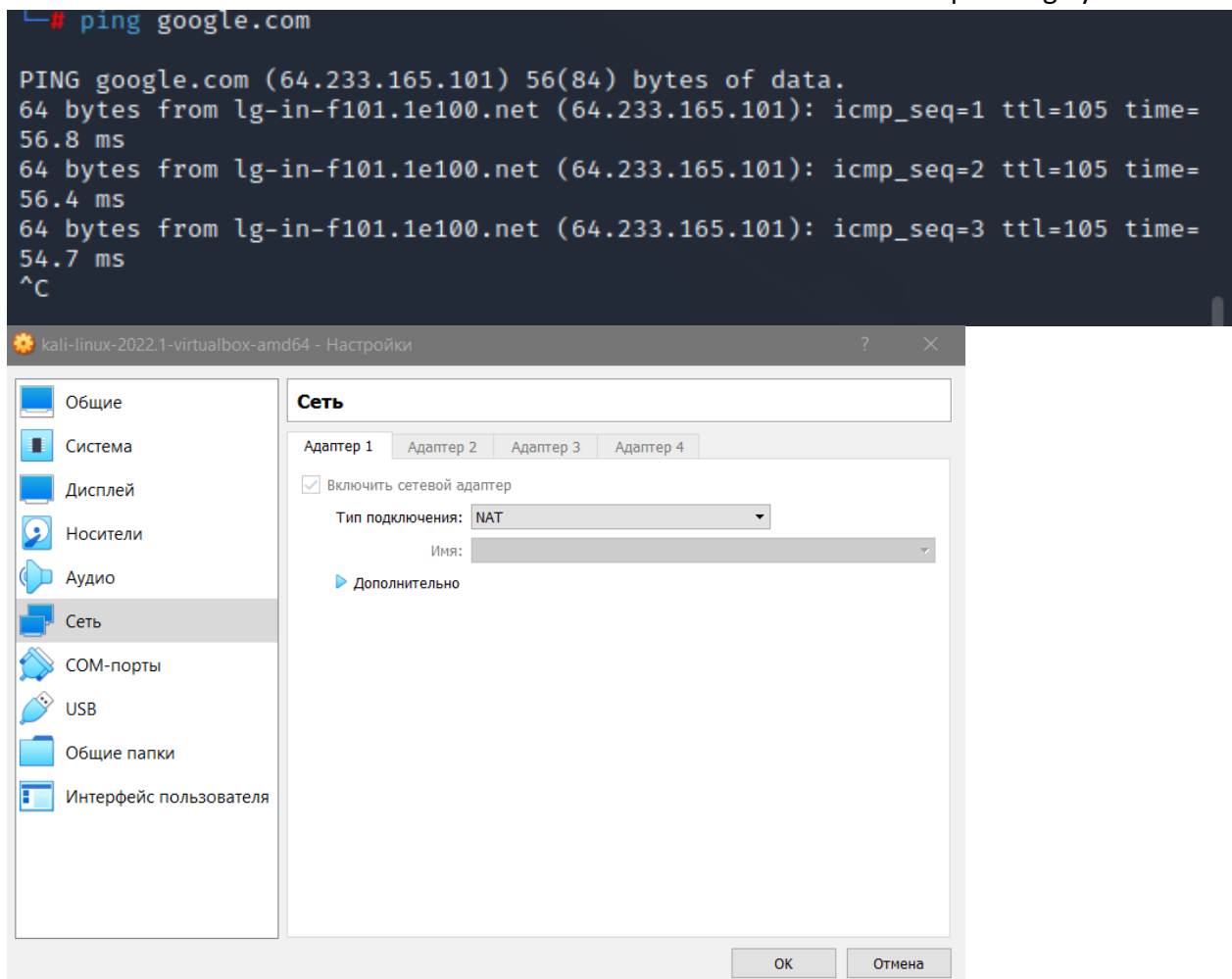
### Connection via NAT

```
(root@kali)-[/home/kali]
# VBoxManage modifyvm kali --nic1 nat
Command 'VBoxManage' not found, but can be installed with:
apt install virtualbox
Do you want to install it? (N/y)y
apt install virtualbox

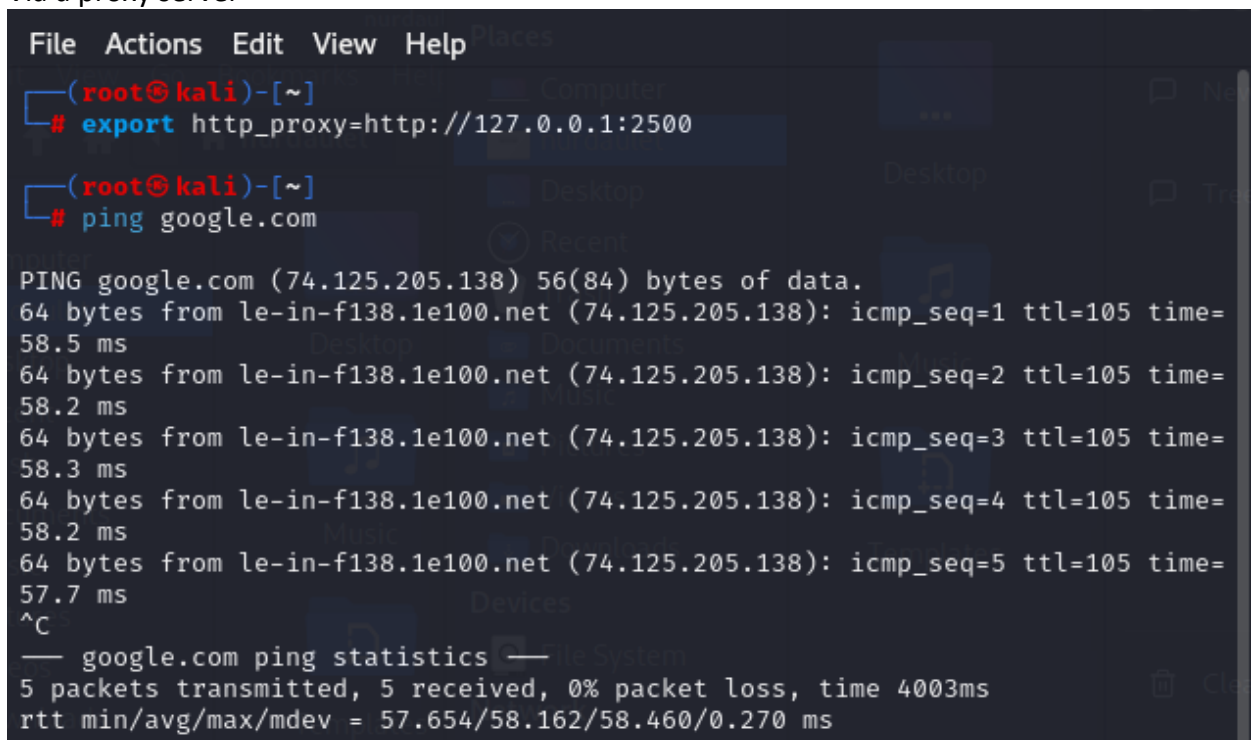
(root@kali)-[/home/kali]
# hostname -I
10.0.2.4

(root@kali)-[/home/kali]
# route add default gw 10.0.2.4 eth0

(root@kali)-[/home/kali]
# echo "nameserver 10.0.2.4" >> /etc/resolv.conf
```

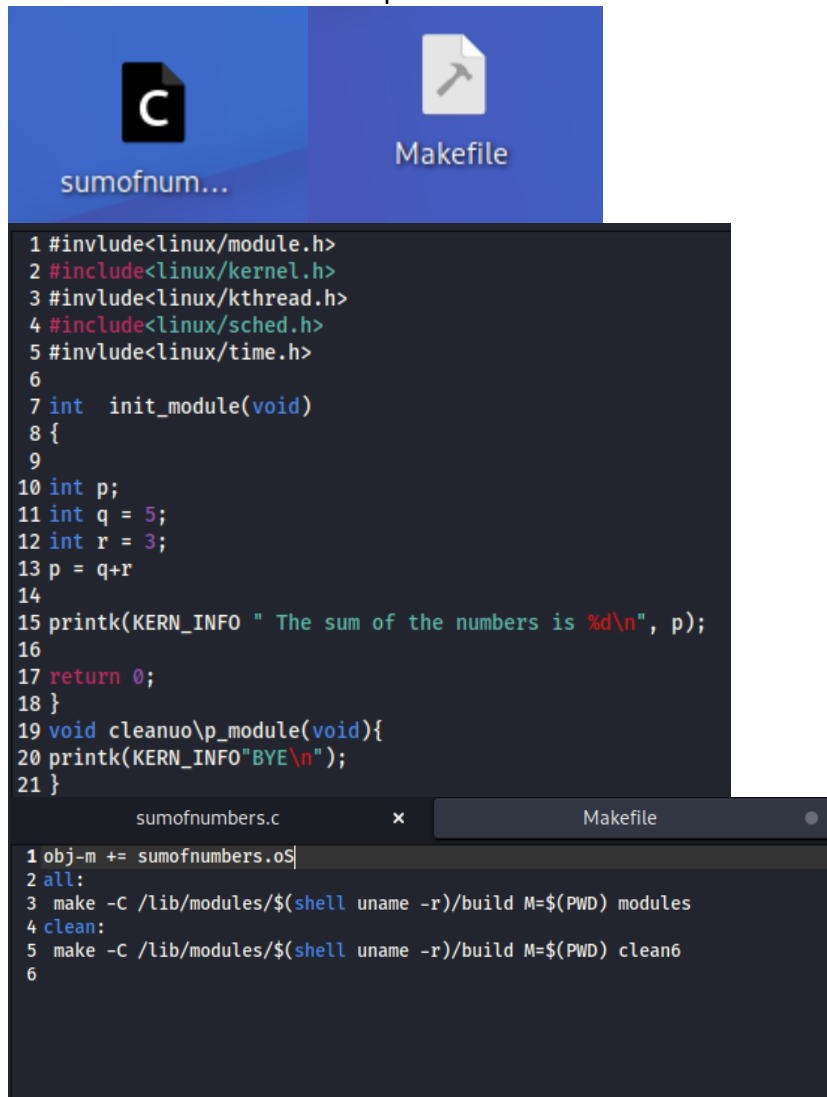


Via a proxy server



## Task 3:

Screenshots of the code compilation result:



The screenshot displays the compilation process of a C program. At the top, two files are shown: 'sumofnum...' (a C source file) and 'Makefile'. Below, a terminal window shows the C code for 'sumofnumbers.c' and the output of the 'make' command.

```
1 #include<linux/module.h>
2 #include<linux/kernel.h>
3 #include<linux/kthread.h>
4 #include<linux/sched.h>
5 #include<linux/time.h>
6
7 int init_module(void)
8 {
9
10 int p;
11 int q = 5;
12 int r = 3;
13 p = q+r
14
15 printk(KERN_INFO " The sum of the numbers is %d\n", p);
16
17 return 0;
18 }
19 void cleanup_module(void){
20 printk(KERN_INFO"BYE\n");
21 }
```

The terminal output shows the compilation steps:

```
1 obj-m += sumofnumbers.o
2 all:
3 make -C /lib/modules/$(shell uname -r)/build M=$(PWD) modules
4 clean:
5 make -C /lib/modules/$(shell uname -r)/build M=$(PWD) clean
6
```