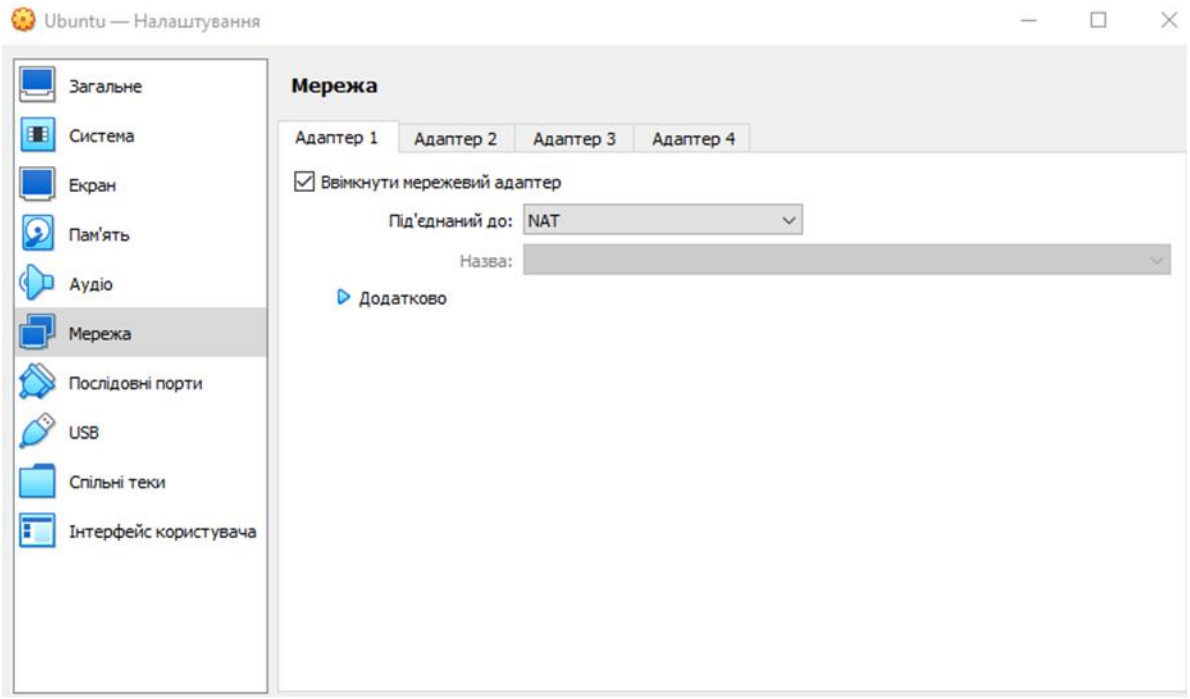
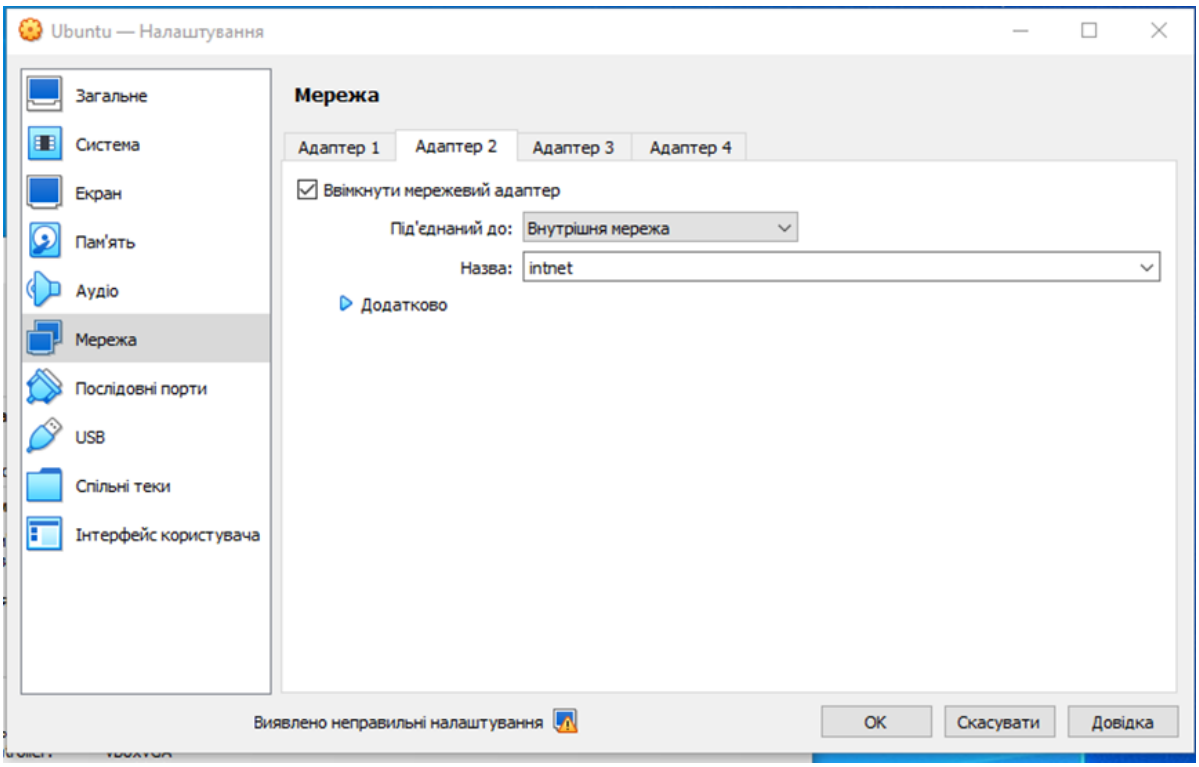
IP routing

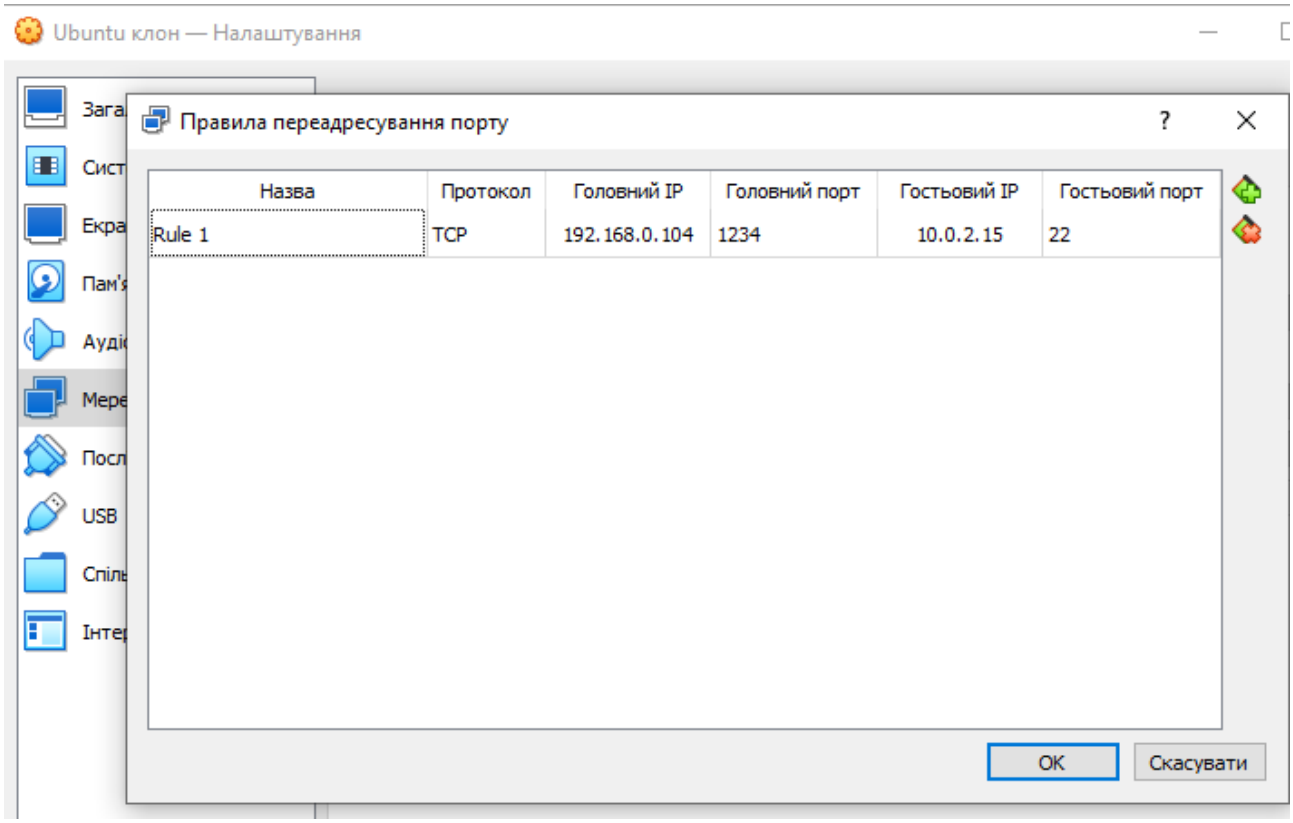
1. Create virtual machines connection according to figure 1

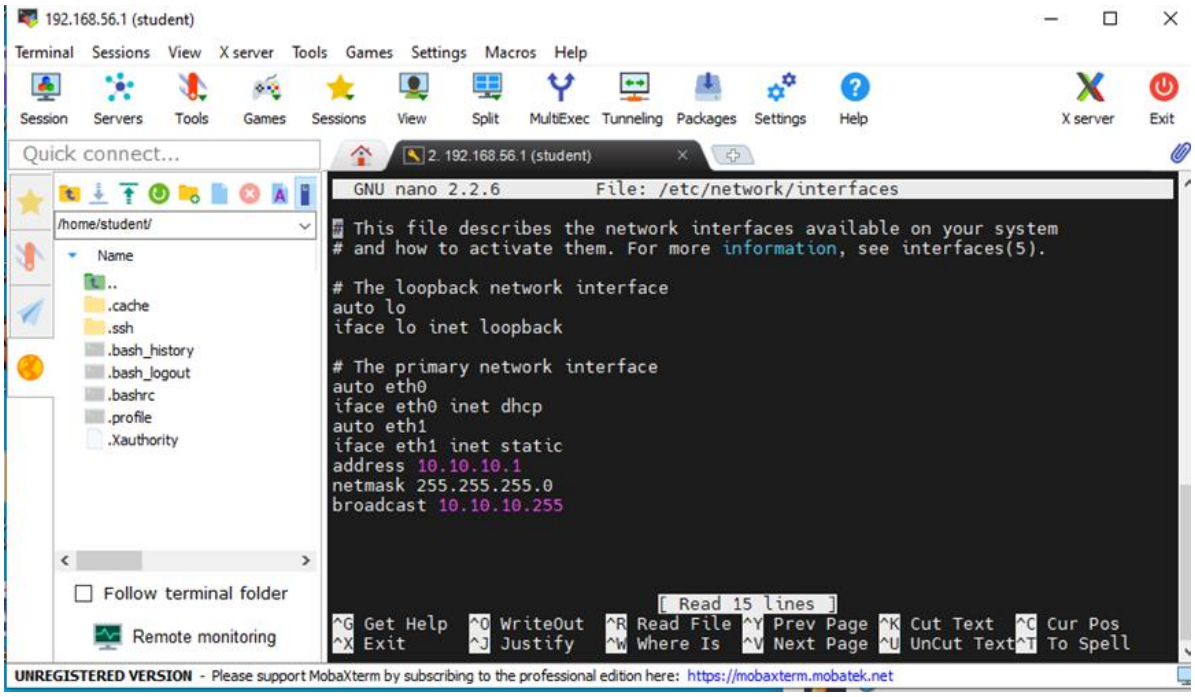
2. VM2 has one interface (internal), VM1 has 2 interfaces (NAT and internal). Configure all network interfaces in order to make VM2 has an access to the Internet (iptables, forward, masquerade).

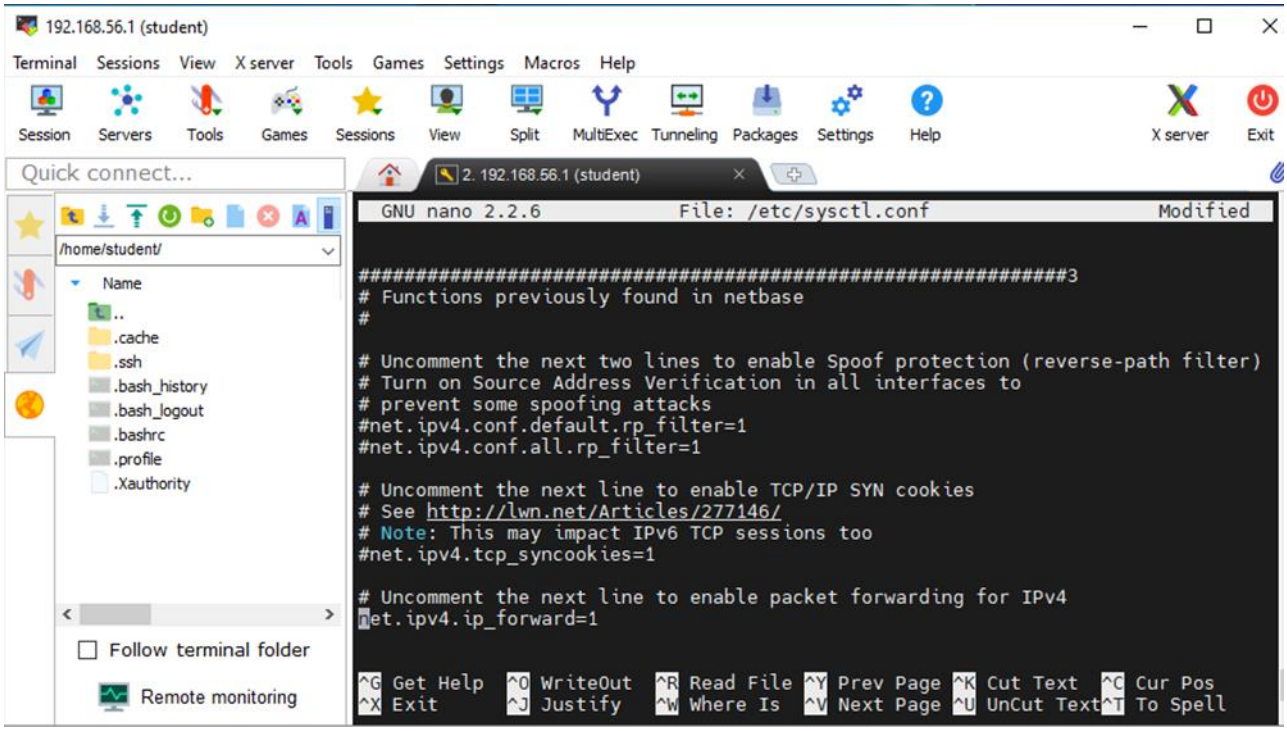
VM1 settings:



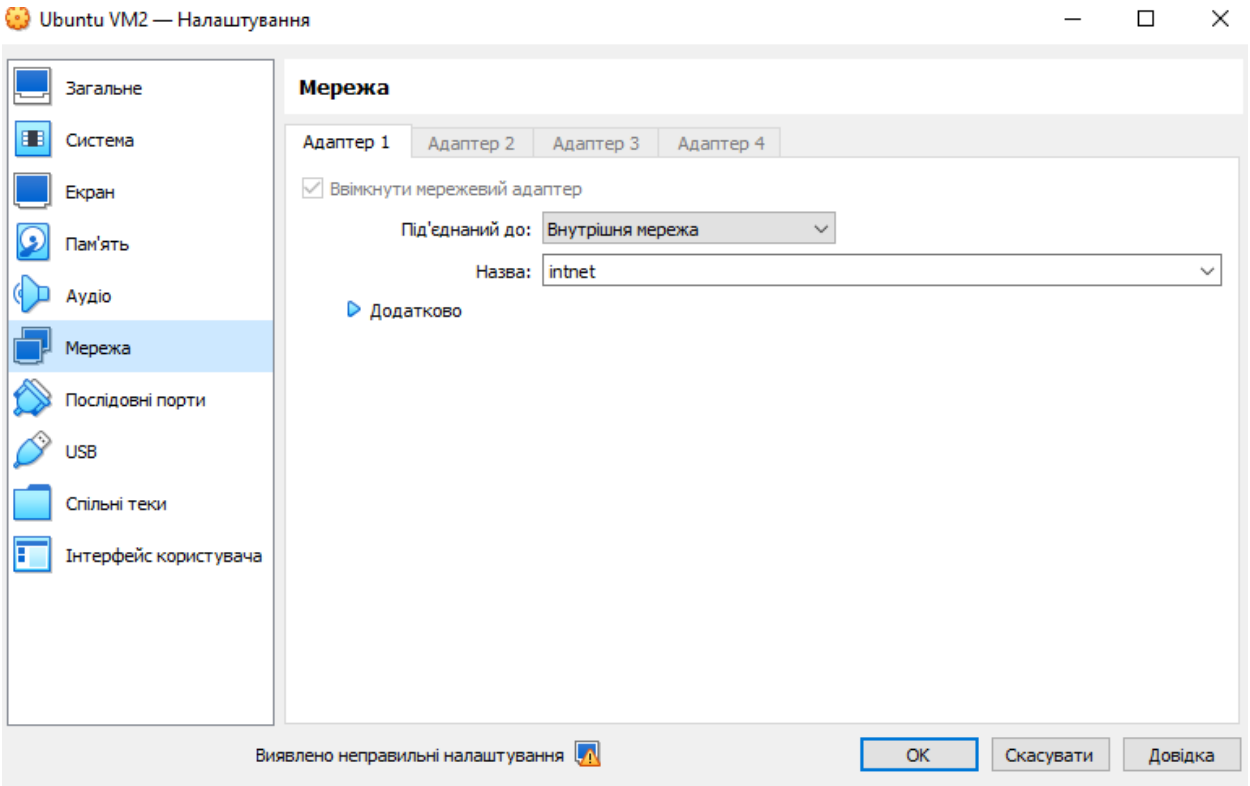


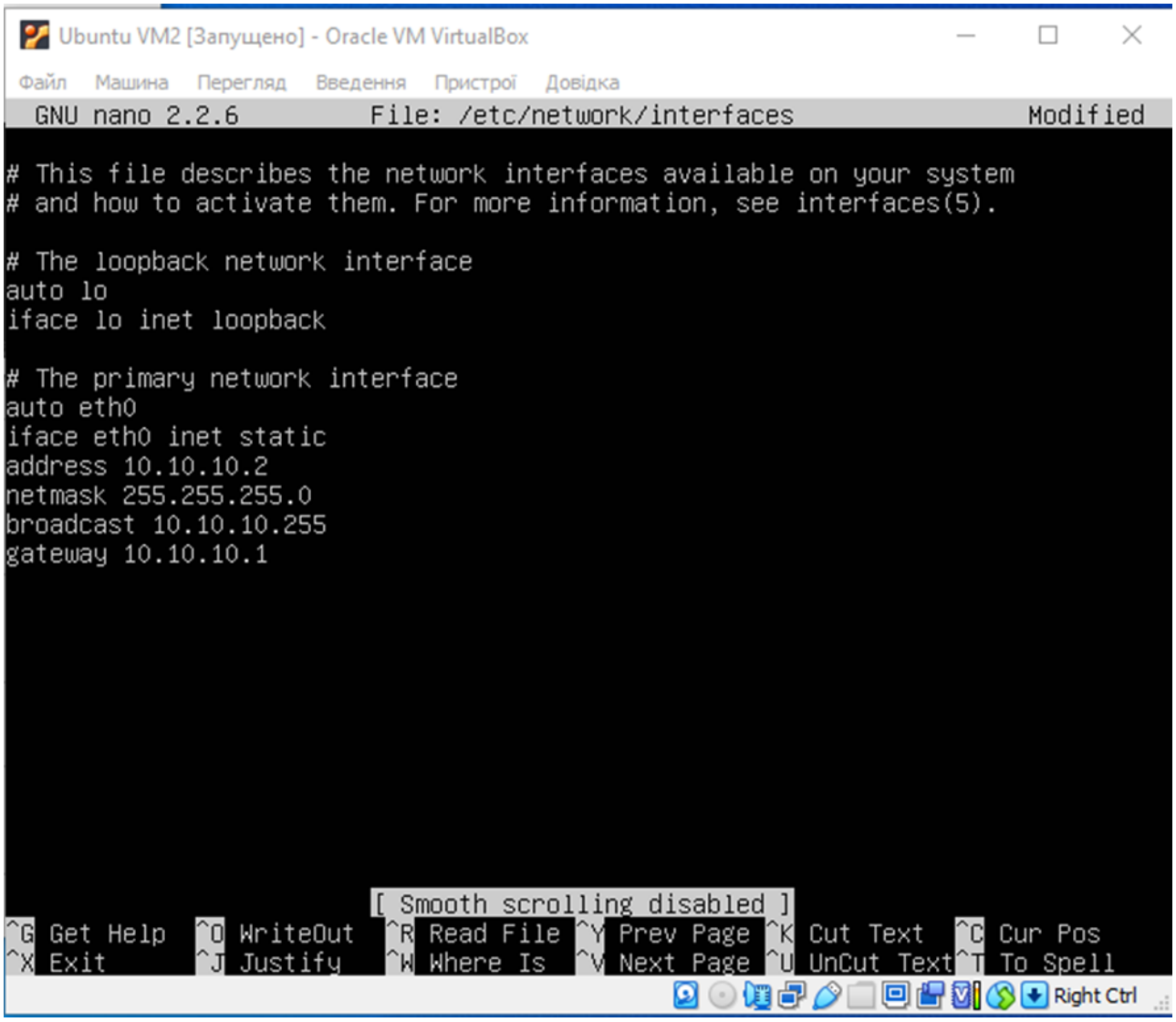

Ubuntu клон — Налаштування
Правила переадресування порту
Назва
Протокол
Головний IP
Головний порт
Гостьовий IP
Гостьовий порт
Rule 1
TCP
192.168.0.104
1234
10.0.2.15
22
OK
Скасувати


192.168.56.1 (student)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit
Quick connect...
2. 192.168.56.1 (student)
/home/student/
Name
.cache
.ssh
.bash_history
.bash_logout
.bashrc
.profile
.Xauthority
Follow terminal folder
Remote monitoring
GNU nano 2.2.6 File: /etc/network/interfaces
This file describes the network interfaces available on your system
and how to activate them. For more information, see interfaces(5).
The loopback network interface
auto lo
iface lo inet loopback
The primary network interface
auto eth0
iface eth0 inet dhcp
auto eth1
iface eth1 inet static
address 10.10.10.1
netmask 255.255.255.0
broadcast 10.10.10.255
[Read 15 lines]
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net

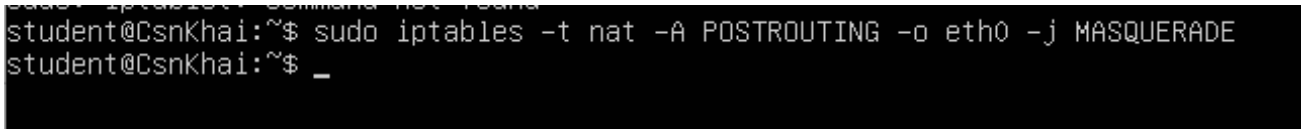


VM2 settings:





$ sudo iptables –t nat –A POSTROUTING –o eth0 –j MASQUERADE



3. Check the route from VM2 to Host.

```
student@CsnKhai:~$ traceroute 192.168.0.104
traceroute to 192.168.0.104 (192.168.0.104), 30 hops max, 60 byte packets
 1  10.10.10.1 (10.10.10.1)  2.282 ms  3.764 ms  4.486 ms
 2  10.0.2.2 (10.0.2.2)  4.517 ms  4.691 ms  6.700 ms


 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  *^C
student@CsnKhai:~$ S
```

4. Check the access to the Internet, (just ping, for example, 8.8.8.8).

```
student@CsnKhai:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
^C
--- 8.8.8.8 ping statistics ---
21 packets transmitted, 0 received, 100% packet loss, time 20087ms

student@CsnKhai:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=113 time=30.6 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=113 time=30.5 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=113 time=71.6 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=113 time=37.8 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=113 time=35.4 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=113 time=58.8 ms
^C
--- 8.8.8.8 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5026ms
rtt min/avg/max/mdev = 30.571/44.163/71.665/15.582 ms
```

5. Determine, which resource has an IP address 8.8.8.8.

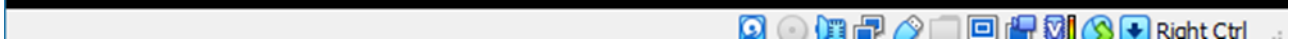
```
student@CsnKhai:~$ host epam.com
epam.com has address 3.214.134.159
epam.com mail is handled by 10 mxb-0039f301.gslb.pphosted.com.
epam.com mail is handled by 10 mxa-0039f301.gslb.pphosted.com.
student@CsnKhai:~$ host 8.8.8.8
8.8.8.8.in-addr.arpa domain name pointer dns.google.
student@CsnKhai:~$
```

6. Determine, which IP address belongs to resource epam.com.

```
student@CsnKhai:~$ host epam.com
epam.com has address 3.214.134.159
epam.com mail is handled by 10 mxb-0039f301.gslb.pphosted.com.
epam.com mail is handled by 10 mxa-0039f301.gslb.pphosted.com.
student@CsnKhai:~$
```

7. Determine the default gateway for your HOST and display routing table.

```
student@CsnKhai:~$
student@CsnKhai:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         10.10.10.1      0.0.0.0         UG    0      0        0 eth0
10.10.10.0      *               255.255.255.0   U     0      0        0 eth0
student@CsnKhai:~$ _
```



8. Trace the route to google.com.

```
tudent@CsnKhai:~$ traceroute www.google.com
raceroute to www.google.com (142.250.203.132), 30 hops max, 60 byte packets
1  10.0.2.2 (10.0.2.2)  1.228 ms  2.695 ms  1.548 ms
2  10.0.2.2 (10.0.2.2)  14.529 ms  13.105 ms  10.644 ms
tudent@CsnKhai:~$ _
```