Template Week 6 – Networking

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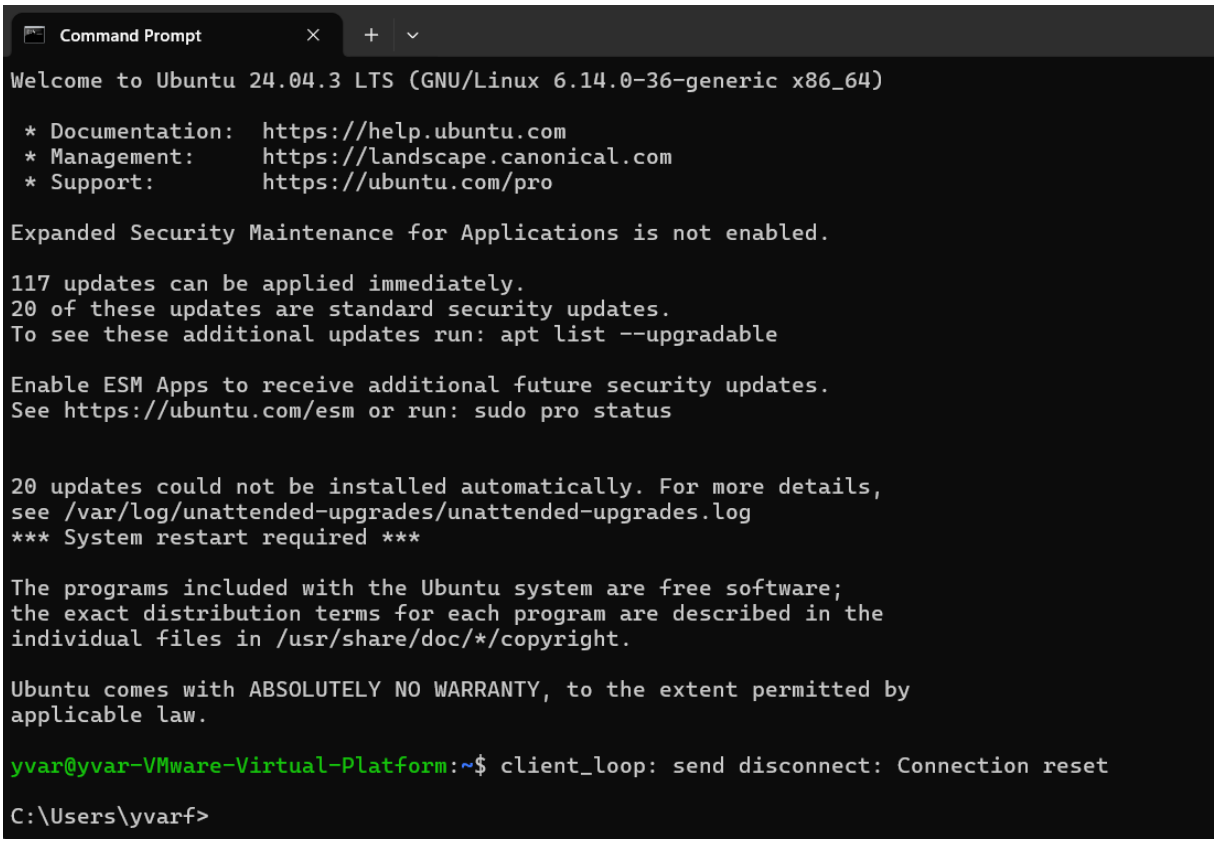
Assignment 6.1: Working from home

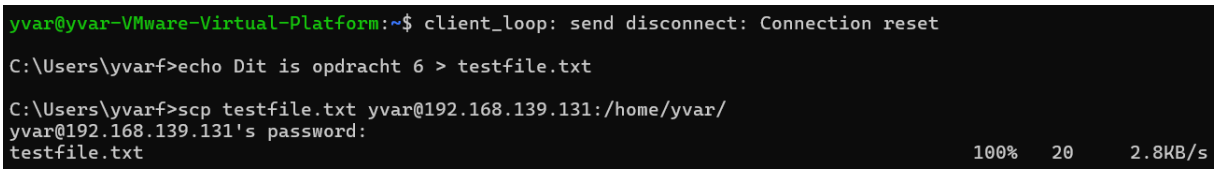
Screenshot installation openssh-server:

```
yvar@yvar-VMware-Virtual-Platform:~/Desktop$ sudo apt install openssh-server -y
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
ld by process 3702 (unattended-upgr)
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
ld by process 3702 (unattended-upgr)
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
ld by process 3702 (unattended-upgr)
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
ld by process 3702 (unattended-upgr)
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is he
ld by process 3702 (unattended-upgr)
Reading package lists... 0%
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
openssh-server is already the newest version (1:9.6p1-3ubuntu13.14).
The following package was automatically installed and is no longer required:
```

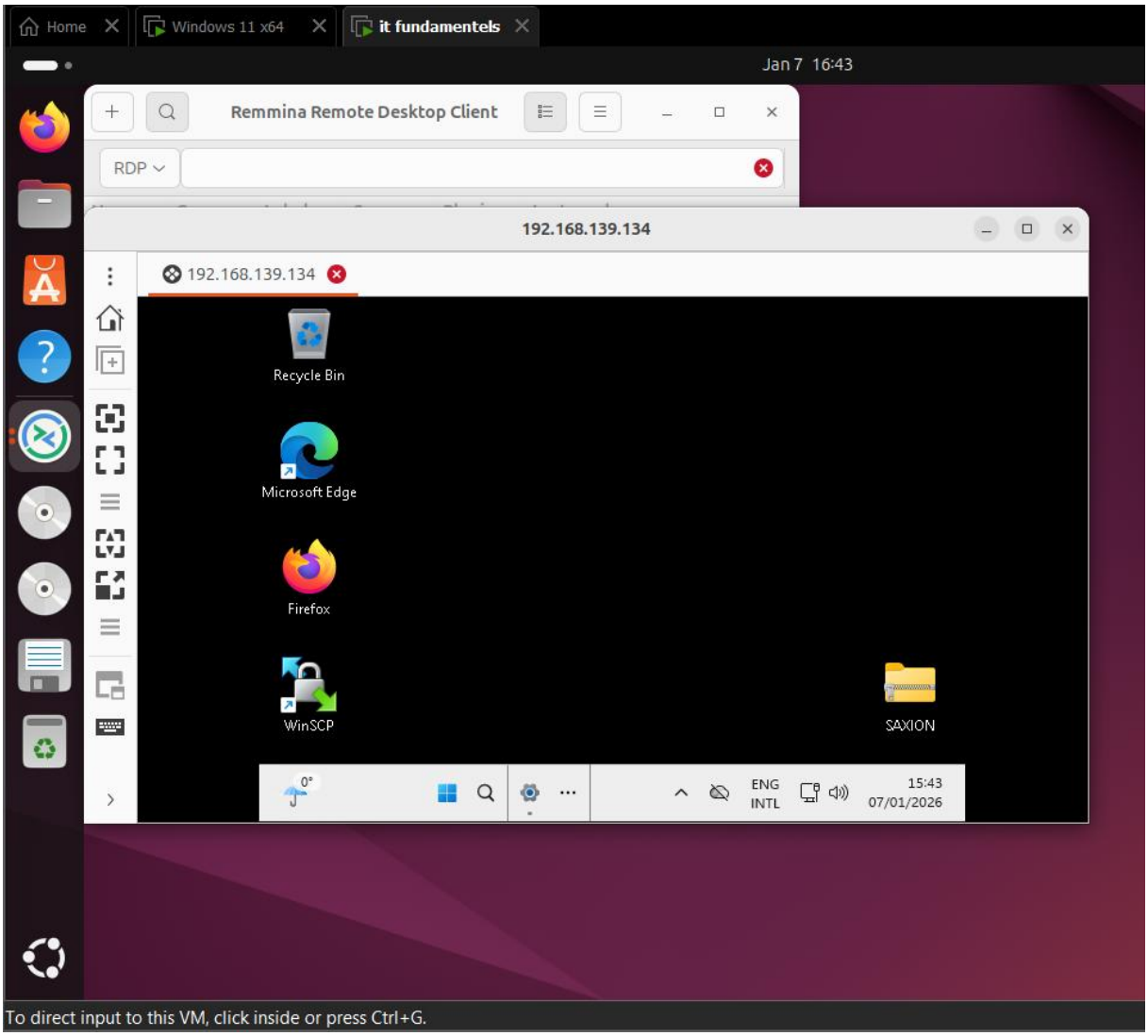
Screenshot successful SSH command execution:



Screenshot successful execution SCP command:



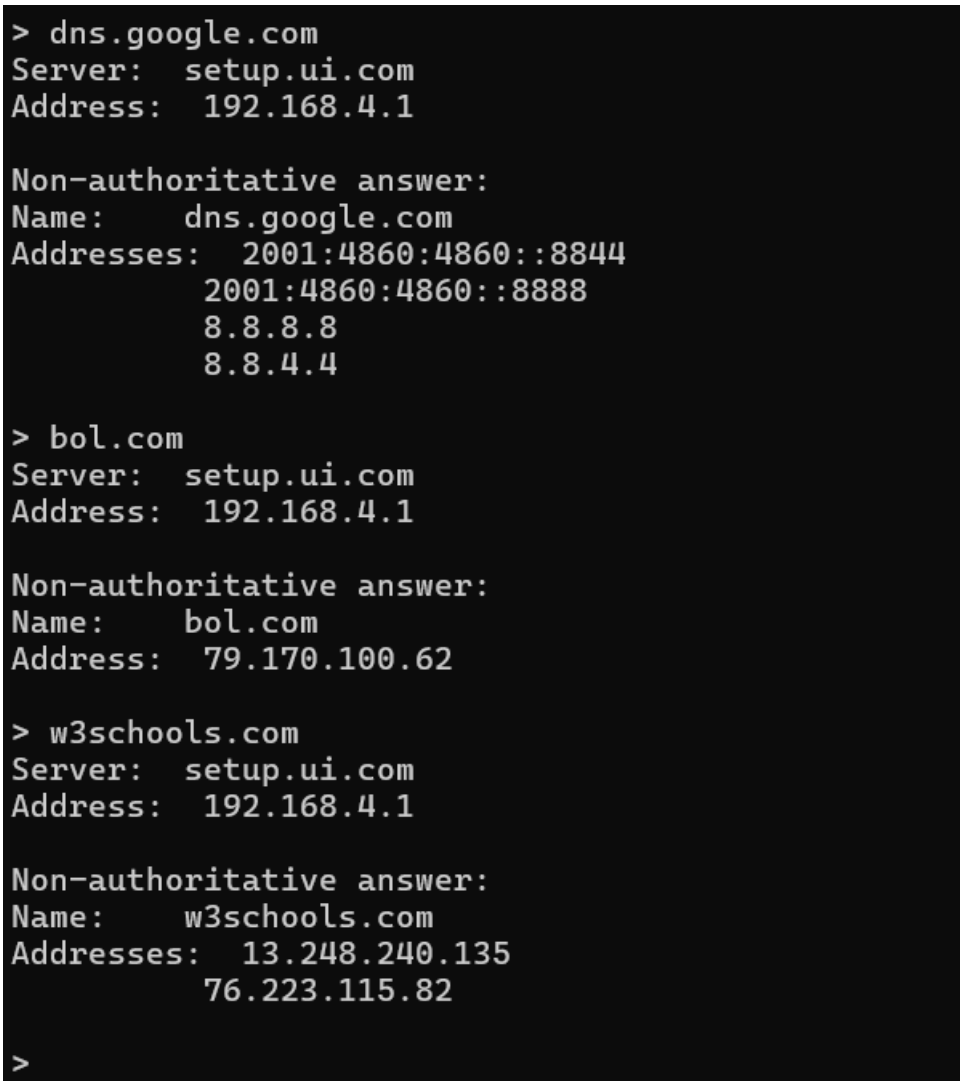
Screenshot remmina:



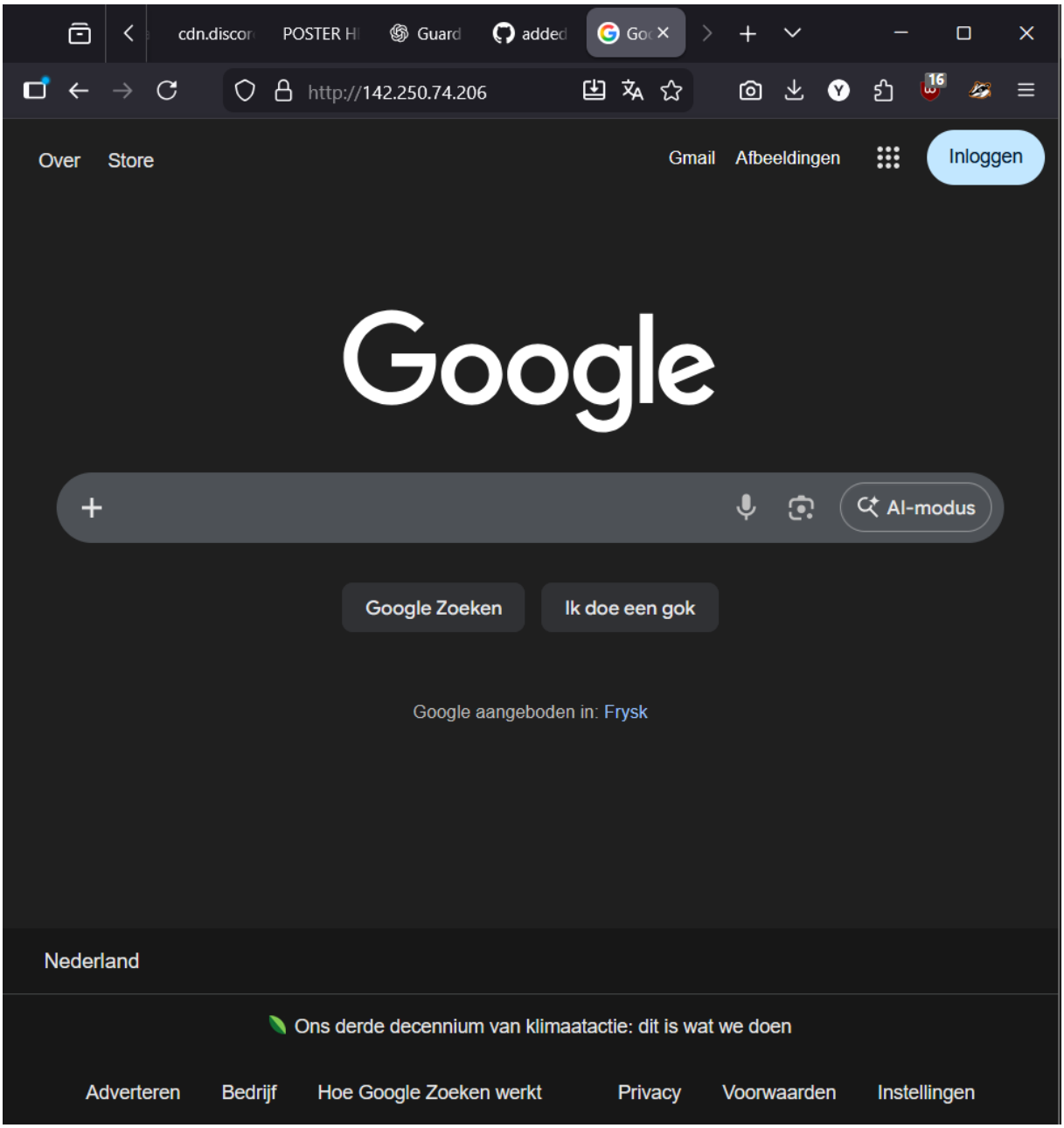
Assignment 6.2: IP addresses websites

Relevant screenshots nslookup command:

```
C:\Users\yvarf>nslookup
Default Server:  setup.ui.com
Address:  192.168.4.1

> amazon.com
Server:  setup.ui.com
Address:  192.168.4.1

Non-authoritative answer:
Name:    amazon.com
Addresses:  98.82.161.185
          98.87.170.74
          98.87.170.71

> google
Server:  setup.ui.com
Address:  192.168.4.1

*** setup.ui.com can't find google: Non-existent domain
> google.com
Server:  setup.ui.com
Address:  192.168.4.1

Non-authoritative answer:
Name:    google.com
Addresses:  2a00:1450:400e:802::200e
          172.217.23.206

> one.one.one.one
Server:  setup.ui.com
Address:  192.168.4.1

Non-authoritative answer:
Name:    one.one.one.one
Addresses:  2606:4700:4700::1001
          2606:4700:4700::1111
          1.0.0.1
          1.1.1.1
```



Screenshot website visit via IP address:



Assignment 6.3: subnetting

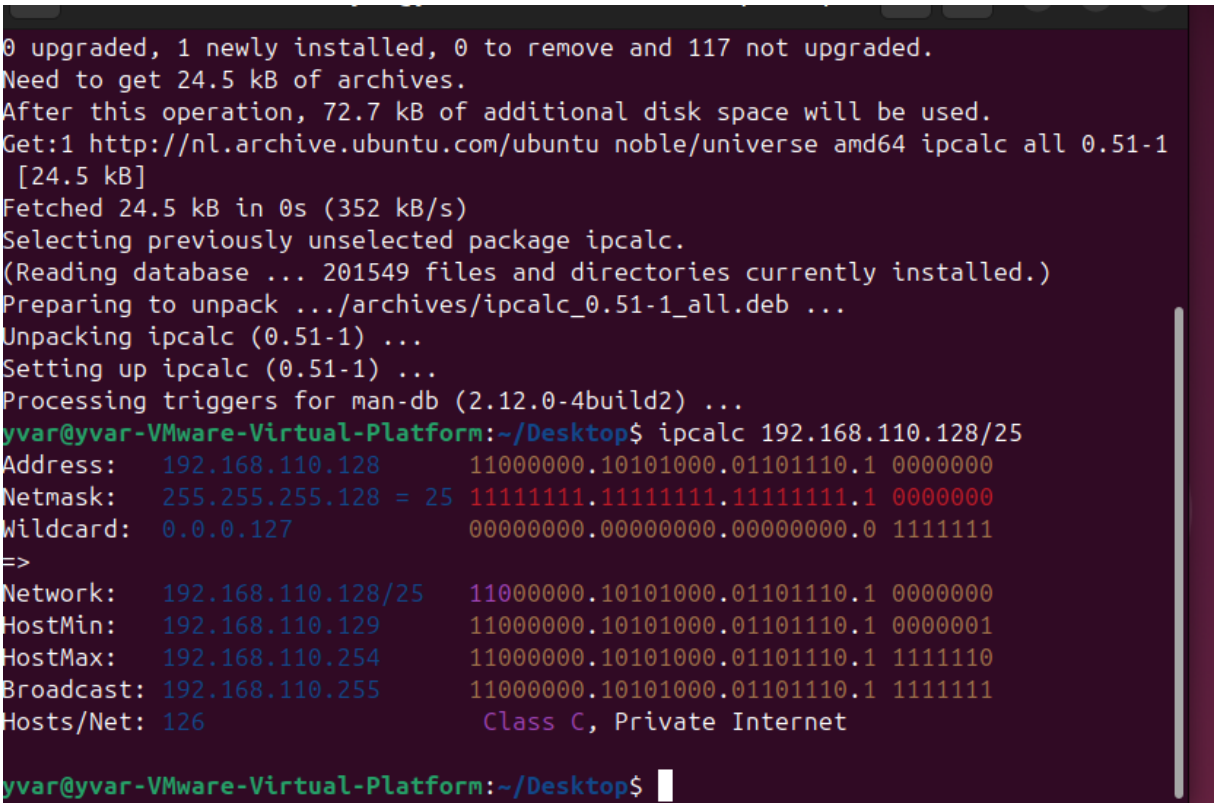
How many IP addresses are in this network configuration 192.168.110.128/25?

128

What is the usable IP range to hand out to the connected computers?

128 maar 1 daarvan is het netwerk adres en 1 daarvan is het broadcast adres dus in totaal 126.

Check your two previous answers with this Linux command: `ipcalc 192.168.110.128/25`

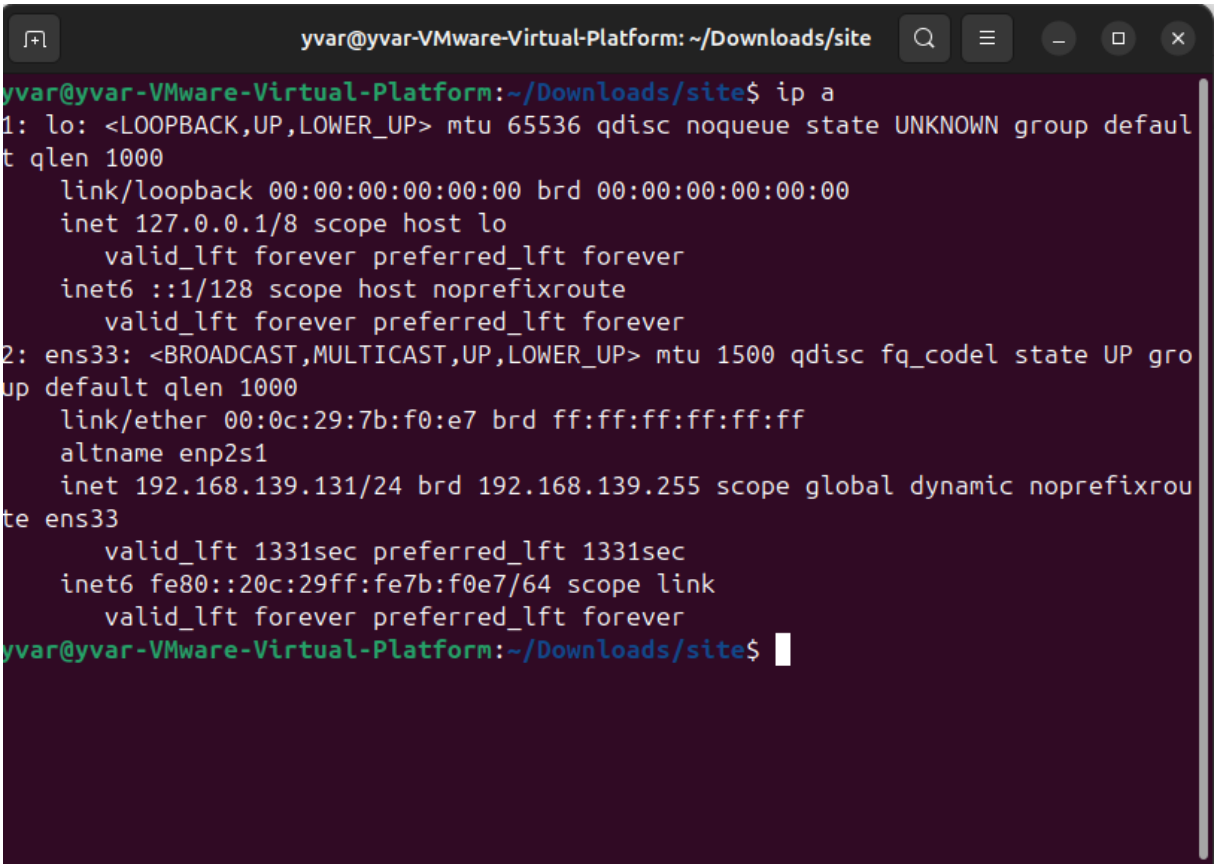


Explain the above calculation in your own words.

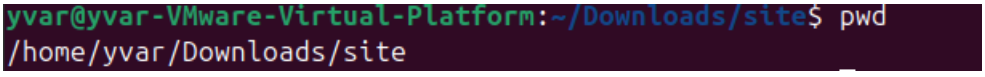
De /25 betakend dat 25 bits worden gebruikt voor het netwerk, daarnaast worden 7 bits gebruikt voor de host adres. Met de 7 host bits zijn er $2^7 = 128$ mogelijke IP adressen. De eerste en de laatste IP adres zijn al ingebruik daardoor kom je uit op 126 IP.

Assignment 6.4: HTML

Screenshot IP address Ubuntu VM:

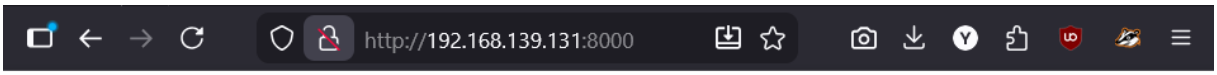


Screenshot of Site directory contents:



Screenshot python3 webserver command:

Screenshot web browser visits your site



home | week 1 | week 2 | week 3 | week 4 | week 5 | week 6 | week 7

Mijn hobby's

1. Gamen
2. Padel

Assignment 6.5: Network segment

Remember that bitwise java application you've made in week 2? Expand that application so that you can also calculate a network segment as explained in the PowerPoint slides of week 6. Use the bitwise & AND operator. You need to be able to input two Strings. An IP address and a subnet.

IP: 192.168.1.100 and subnet: 255.255.255.224 for /27

```
Example: 192.168.1.100/27
Calculate the network segment
IP Address:   11000000.10101000.00000001.01100100
Subnet Mask:  11111111.11111111.11111111.11100000
-----------------------------------------------
Network Addr: 11000000.10101000.00000001.01100000

This gives 192.168.1.96 in decimal as the network address.
```

For a /27 subnet, each segment (or subnet) has 32 IP addresses (2^5).
The range of this network segment is from 192.168.1.96 to 192.168.1.127.

Paste source code here, with a screenshot of a working application.

```
C:\Users\yvarf\.jdks\ms-21.0.8\bin\java.exe

Maak een keuze:
1. Is number odd?
2. Is number a power of 2?
3. Two's complement of number
4. Calculate network segment
0. Exit
4
IP address: 192.168.1.100
Subnet mask: 255.255.255.224

Binary calculation:
11000000 & 11111111 = 11000000
10101000 & 11111111 = 10101000
00000001 & 11111111 = 00000001
01100100 & 11100000 = 01100000

Network address (decimal): 192.168.1.96
Network range:
From 192.168.1.96
To   192.168.1.127
```

Ready? Save this file and export it as a pdf file with the name: **week6.pdf**