Template Week 6 – Networking

Student number:

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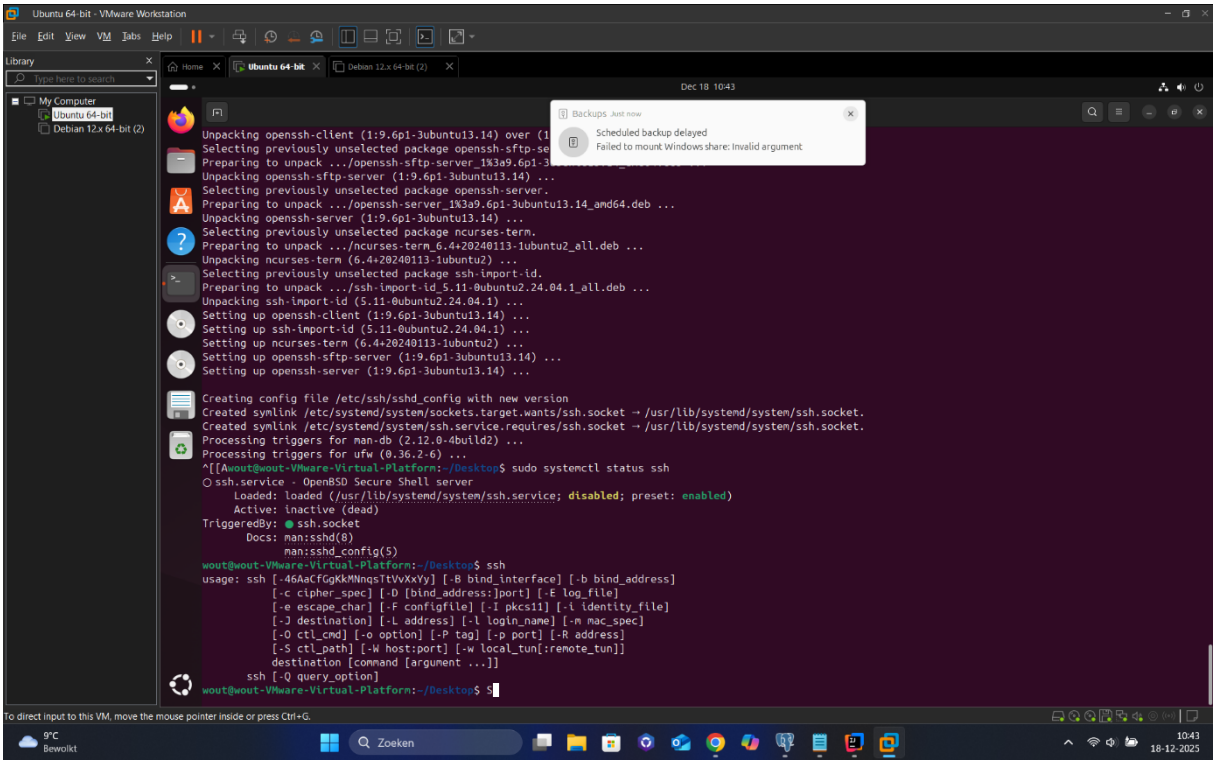
Assignment 6.1: Working from home

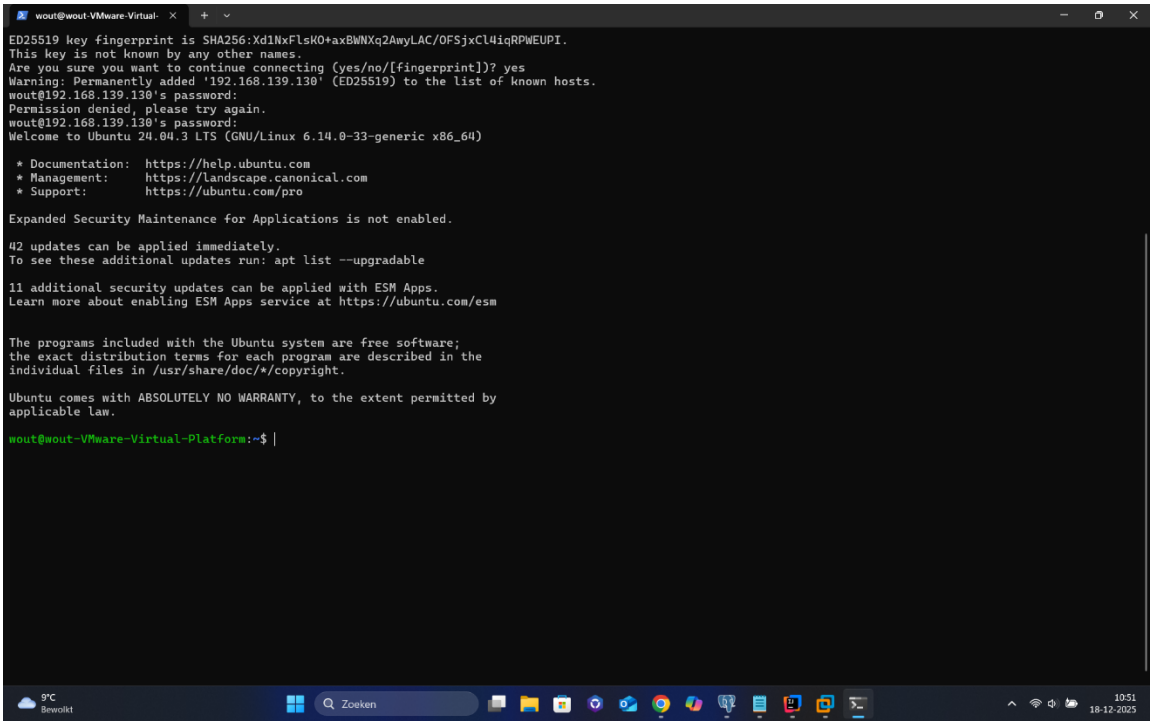
Screenshot installation openssh-server:



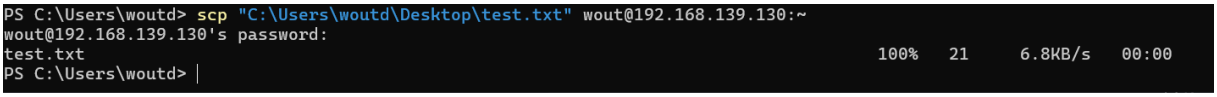
Je kan het laatste gedeelte van de installatie van openssh-server nog zien.

Daaronder heb ik de SSH op actief gezet.

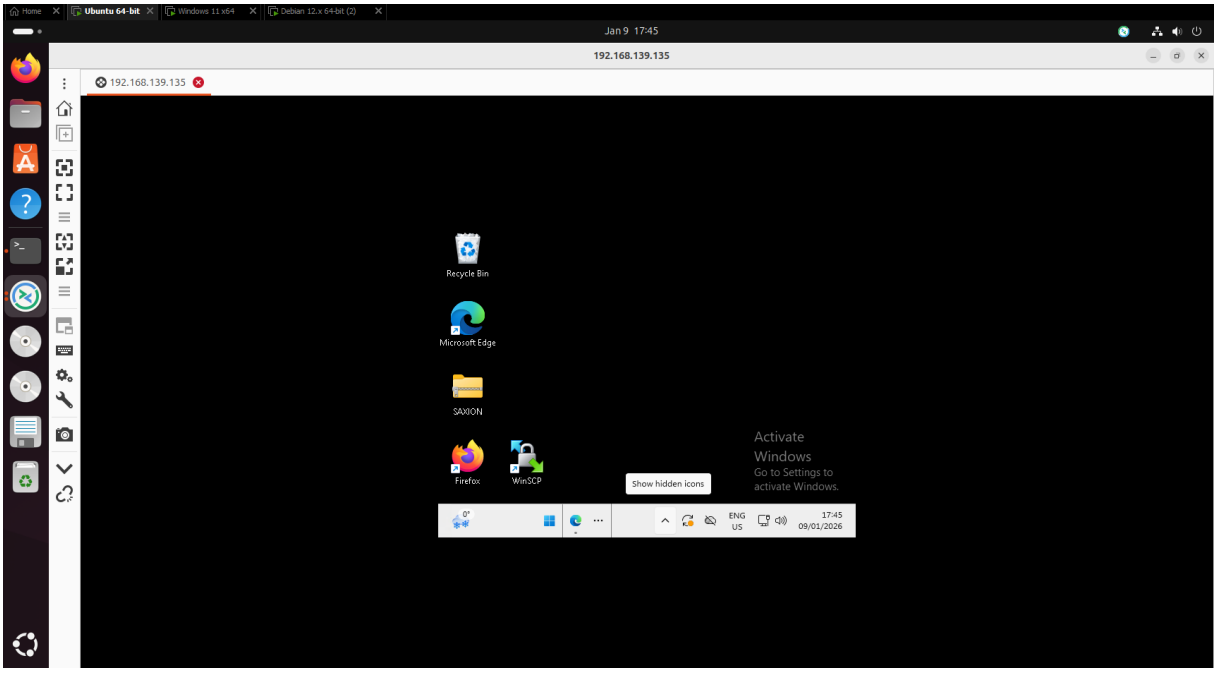
Screenshot successful SSH command execution:



Screenshot successful execution SCP command:

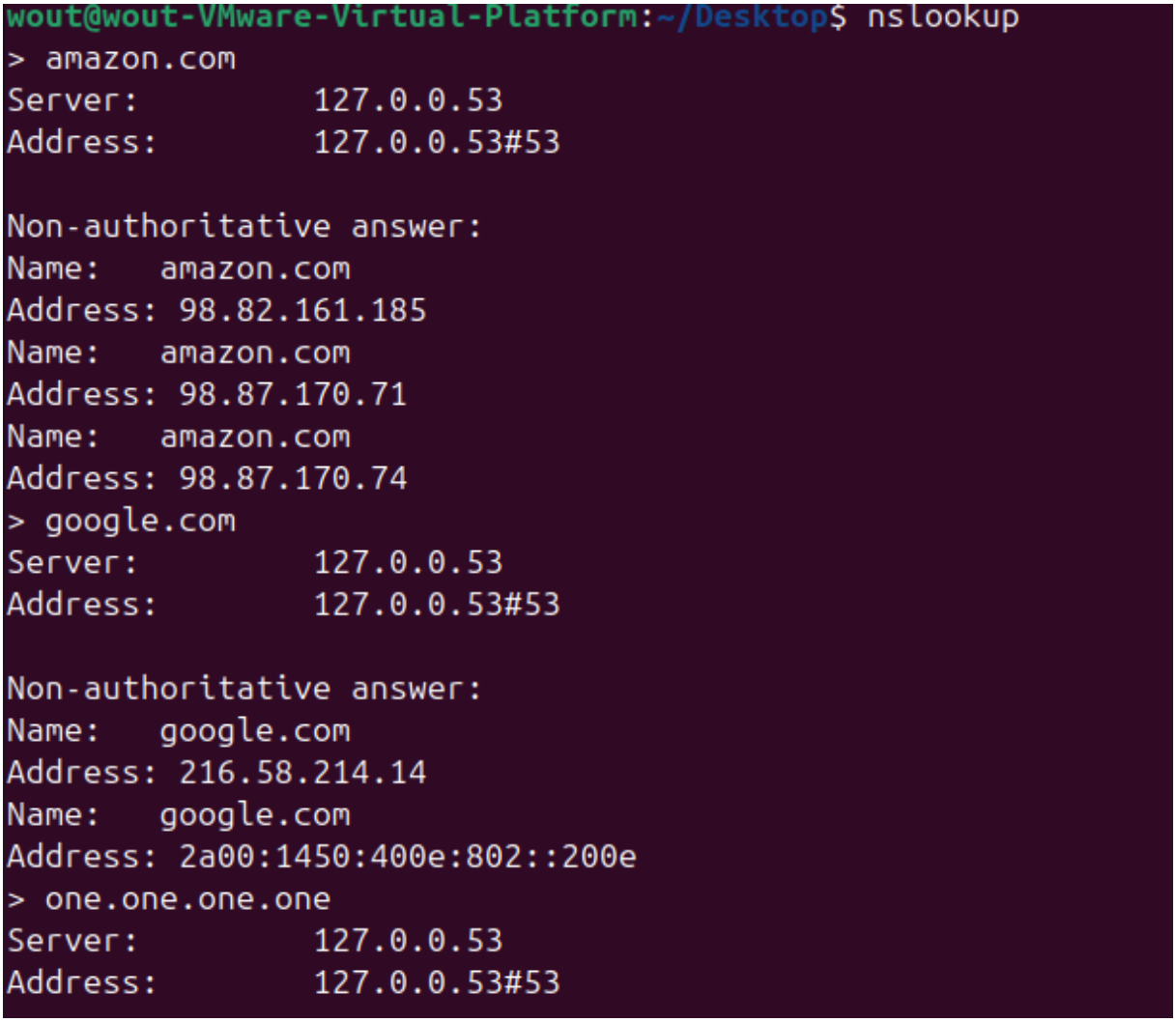


Screenshot remmina:



Assignment 6.2: IP addresses websites

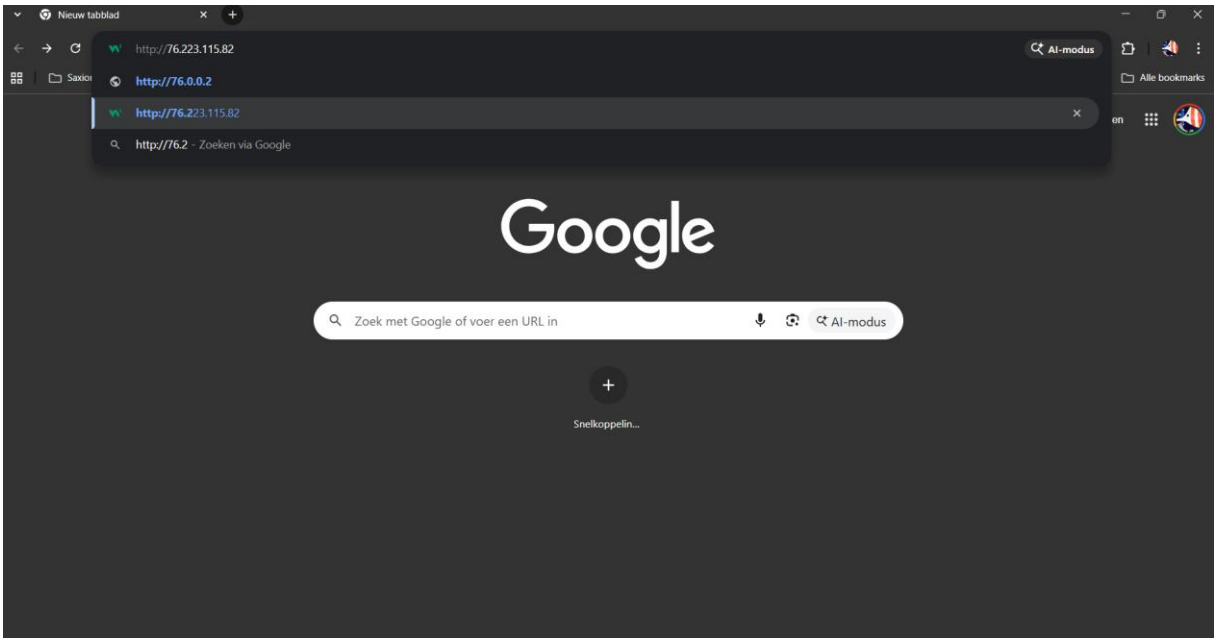
Relevant screenshots nslookup command:

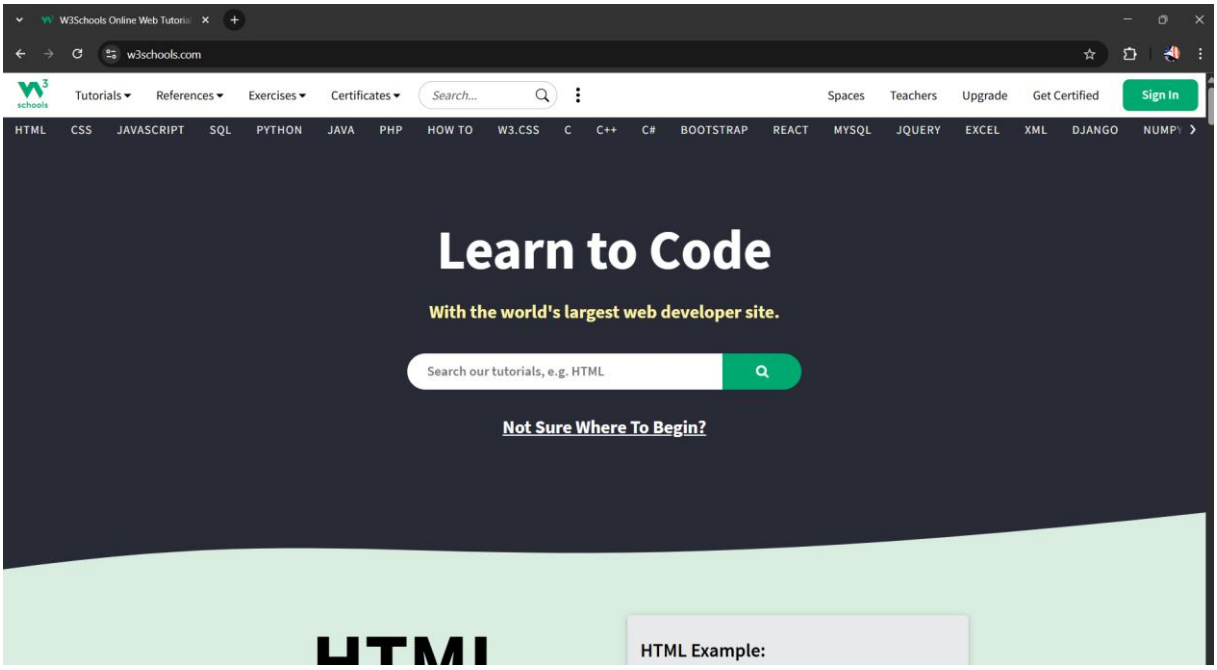


```
Non-authoritative answer:
Name:   one.one.one.one
Address: 1.0.0.1
Name:   one.one.one.one
Address: 1.1.1.1
Name:   one.one.one.one
Address: 2606:4700:4700::1001
Name:   one.one.one.one
Address: 2606:4700:4700::1111
> dns.google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   dns.google.com
Address: 8.8.8.8
Name:   dns.google.com
Address: 8.8.4.4
Name:   dns.google.com
Address: 2001:4860:4860::8888
Name:   dns.google.com
Address: 2001:4860:4860::8844
> bol.com
Server:         127.0.0.53
Address:        127.0.0.53#53
```

```
Non-authoritative answer:
Name:   bol.com
Address: 79.170.100.62
> w3schools.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   w3schools.com
Address: 76.223.115.82
Name:   w3schools.com
Address: 13.248.240.135
> exit

wout@wout-VMware-Virtual-Platform:~/Desktop$
```

Screenshot website visit via IP address:





Assignment 6.3: subnetting

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

/25 = 25 bits voor het network

32 – 25 = 7 hostbits

2^7 = 128 ip adressen in het subnet

128 – 2 voor het netwerk adres en broadcast adres = 126 bruikbare ip adressen

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

128 ip adressen zit hier tussen: 192.168.110.128 – 192.168.110.255

De eerste en laatste worden gebruikt door het internet en broadcast dus:

192.168.110.129 – 192.168.110.254 zijn de bruikbare ip adressen.

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

```
wout@wout-VMware-Virtual-Platform:~/Desktop$ ipcalc 192.168.110.128/25
Address:   192.168.110.128      11000000.10101000.01101110.1 0000000
Netmask:   255.255.255.128 = 25 11111111.11111111.11111111.1 0000000
Wildcard:  0.0.0.127            00000000.00000000.00000000.0 1111111
=>
Network:   192.168.110.128/25   11000000.10101000.01101110.1 0000000
HostMin:   192.168.110.129      11000000.10101000.01101110.1 0000001
HostMax:   192.168.110.254      11000000.10101000.01101110.1 1111110
Broadcast: 192.168.110.255      11000000.10101000.01101110.1 1111111
Hosts/Net: 126                   Class C, Private Internet

wout@wout-VMware-Virtual-Platform:~/Desktop$
```

Dit komt overeen met mijn berekeningen

Explain the above calculation in your own words.

Het subnet /25 betekent dat er 7 bits overblijven voor hosts.
Met 7 bits kun je 2^7 = 128 IP-adressen maken.
Daarvan zijn er 2 gereserveerd (network + broadcast), dus 126 bruikbaar.
De bruikbare IP-range is 192.168.110.129 t/m 192.168.110.254.

Assignment 6.4: HTML

Screenshot IP address Ubuntu VM:

```
wout@wout-VMware-Virtual-Platform:~/Website2/site$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:4e:b0:a1 brd ff:ff:ff:ff:ff:ff
    altname enp2s1
    inet 192.168.139.130/24 brd 192.168.139.255 scope global dynamic noprefixroute ens33
       valid_lft 1719sec preferred_lft 1719sec
    inet6 fe80::204:d513:c47f:55be/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

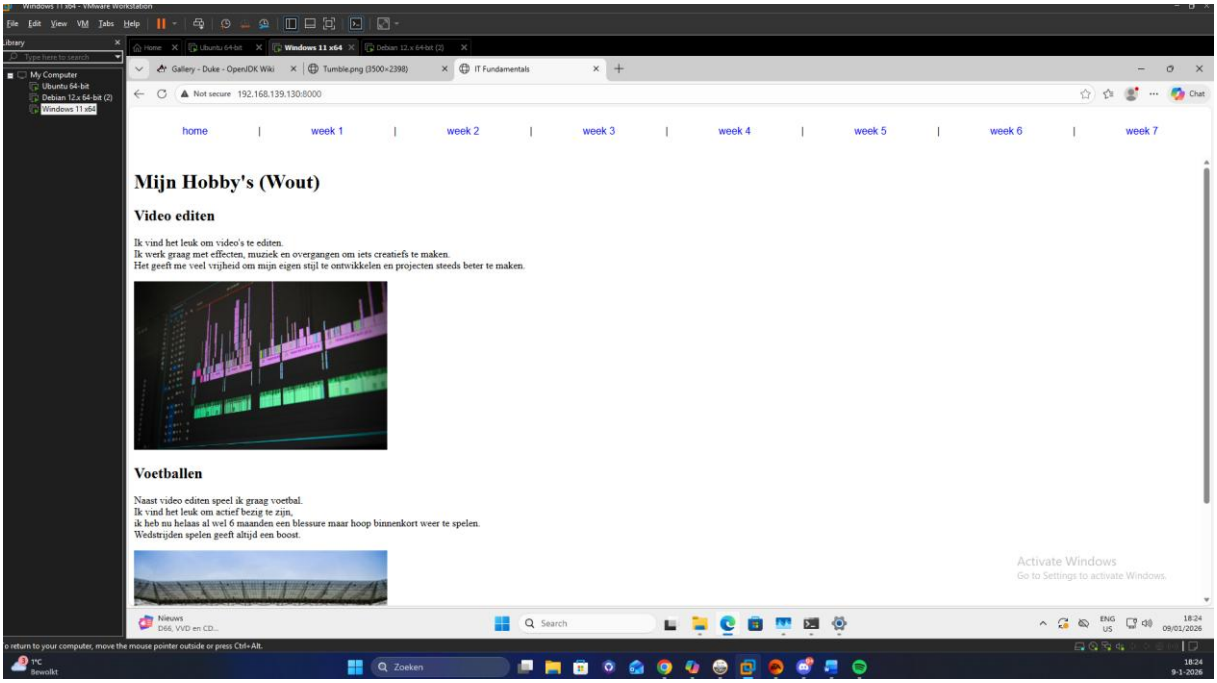
Screenshot of Site directory contents:

```
wout@wout-VMware-Virtual-Platform: ~/Website2
wout@wout-VMware-Virtual-Platform:~/Desktop$ cd ~
wout@wout-VMware-Virtual-Platform:~$ ls
archive.tar.gz  Desktop  Documents  Downloads  hello  Music  Pictures  Public  snap  tekst2.txt  tekst.txt  Templates  test.txt  Videos  Website2
wout@wout-VMware-Virtual-Platform:~$ cd Website2
wout@wout-VMware-Virtual-Platform:~/Website2$ tree
.
└── site
    ├── css
    │   └── mypdfstyle.css
    ├── home.html
    ├── images
    ├── index.html
    ├── pdf
    │   ├── week1.pdf
    │   ├── week2.pdf
    │   ├── week3.pdf
    │   ├── week4.pdf
    │   ├── week5.pdf
    │   ├── week6.pdf
    │   └── week7.pdf
    ├── week1.html
    ├── week2.html
    ├── week3.html
    ├── week4.html
    ├── week5.html
    ├── week6.html
    └── week7.html

5 directories, 17 files
wout@wout-VMware-Virtual-Platform:~/Website2$
```

Screenshot python3 webserver command:

```
wout@wout-VMware-Virtual-Platform:~/Website2/site$ python3 -m http.server 8000
Serving HTTP on 0.0.0.0 port 8000 (http://0.0.0.0:8000/) ...
192.168.139.135 - - [09/Jan/2026 18:24:15] "GET / HTTP/1.1" 200 -
192.168.139.135 - - [09/Jan/2026 18:24:15] "GET /css/mypdfstyle.css HTTP/1.1" 20
0 -
192.168.139.135 - - [09/Jan/2026 18:24:15] "GET /home.html HTTP/1.1" 200 -
192.168.139.135 - - [09/Jan/2026 18:24:16] code 404, message File not found
192.168.139.135 - - [09/Jan/2026 18:24:16] "GET /favicon.ico HTTP/1.1" 404 -
```

Screenshot web browser visits your site



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.

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