Template Week 6 – Networking

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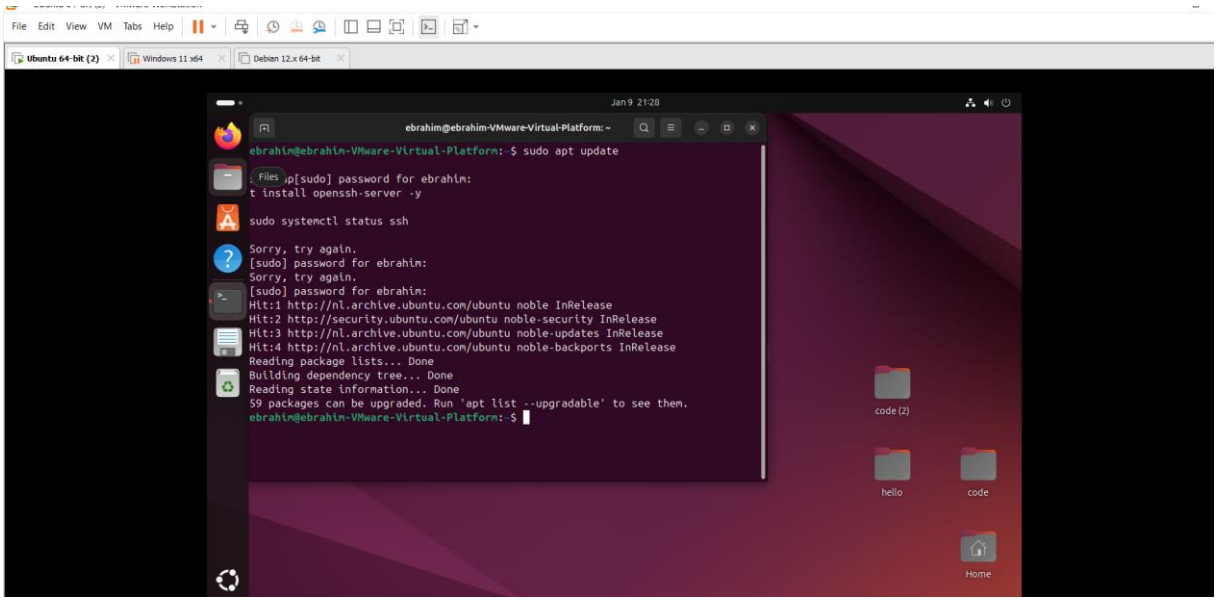
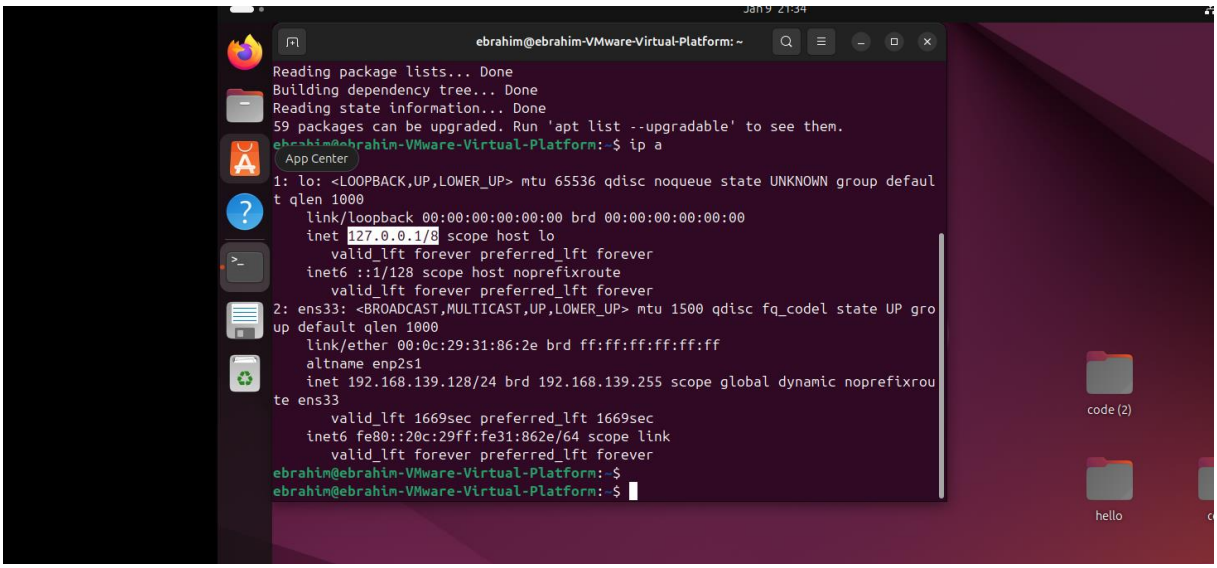
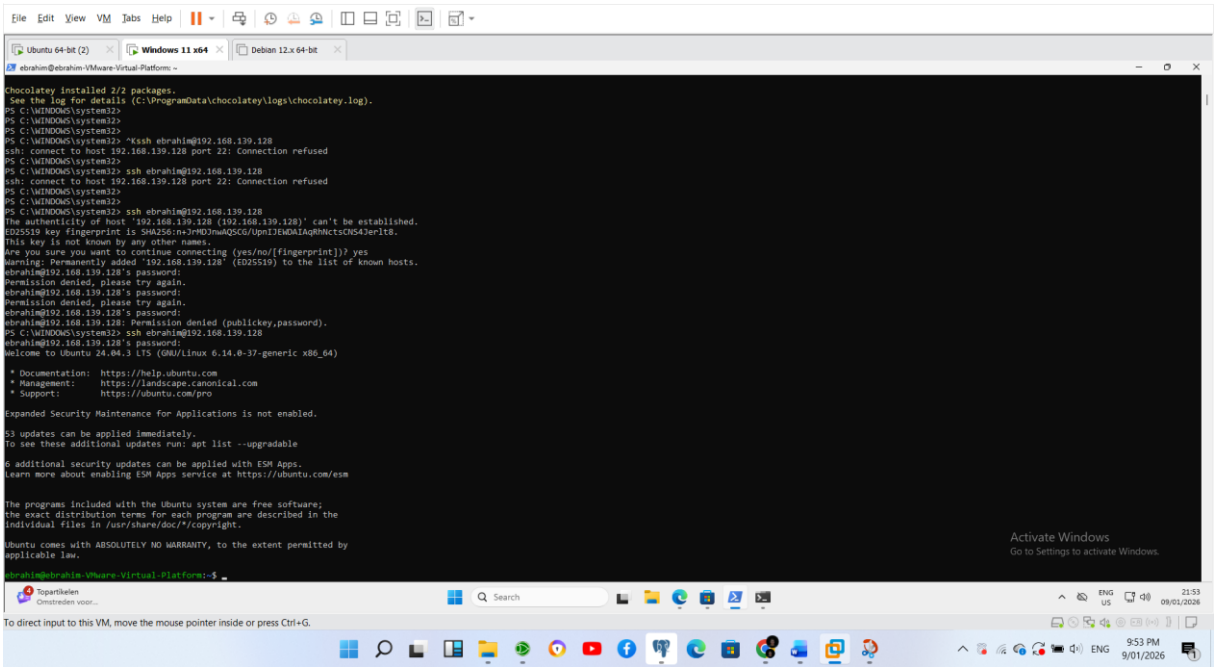
Assignment 6.1: Working from home

Screenshot installation openssh-server:

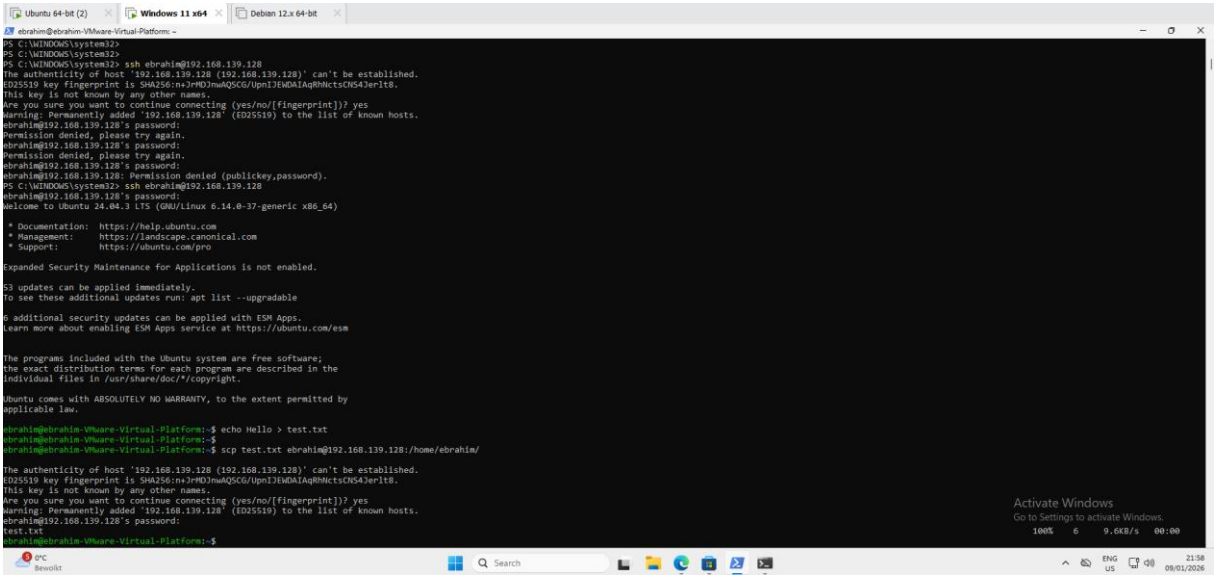


Screenshot successful SSH command execution:

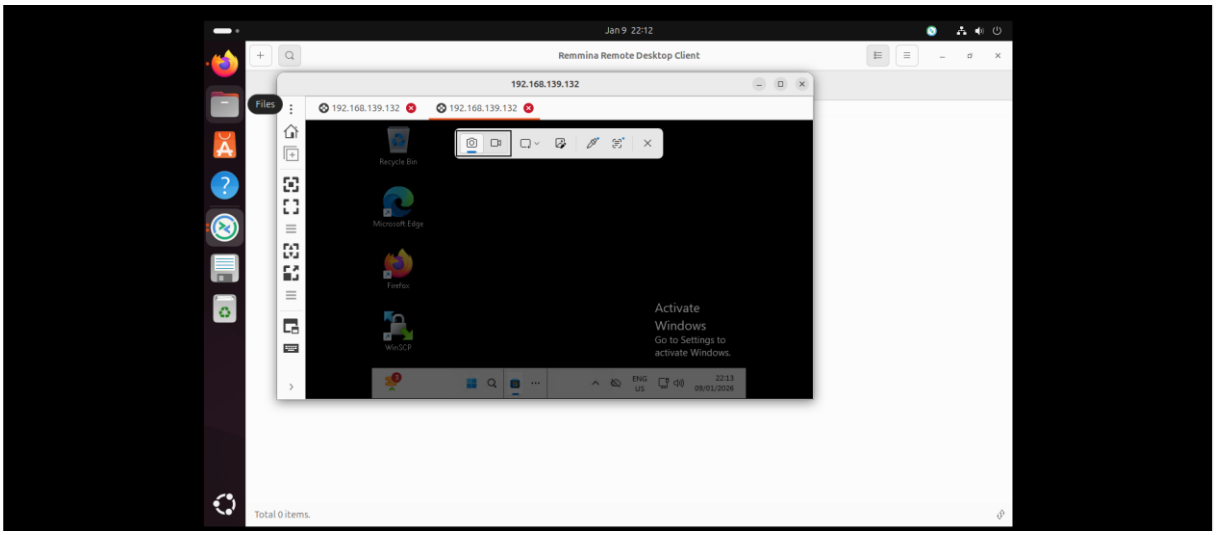


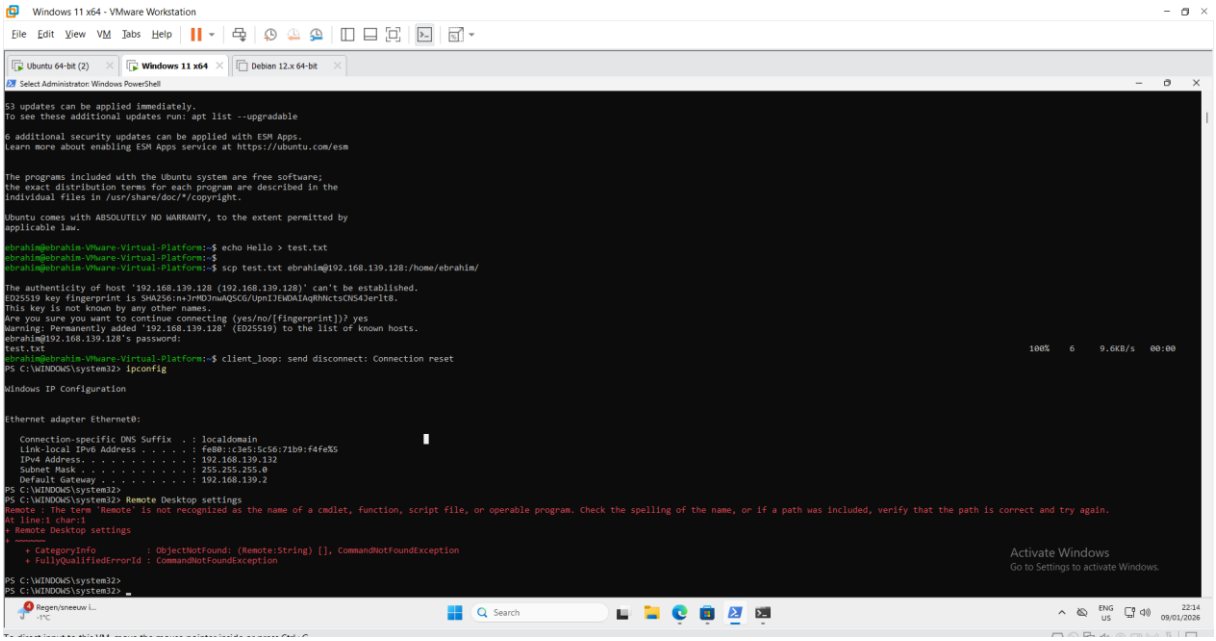


Screenshot successful execution SCP command:



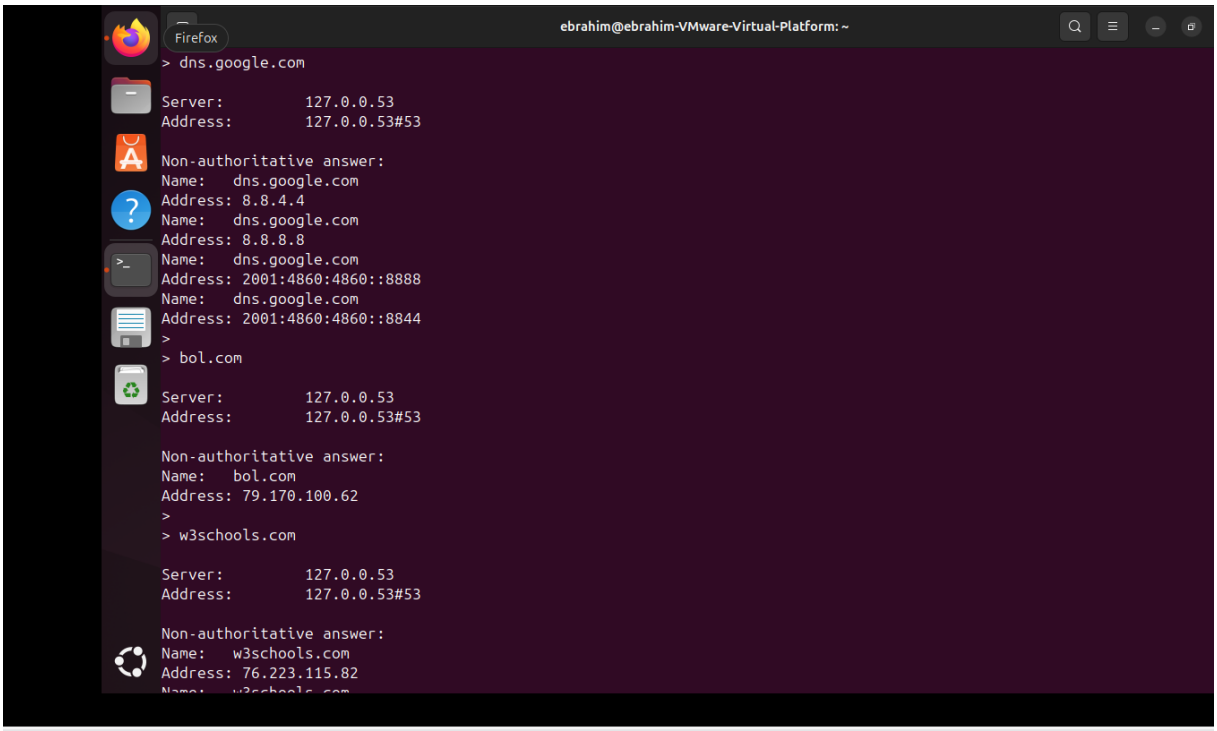
Screenshot remmina:



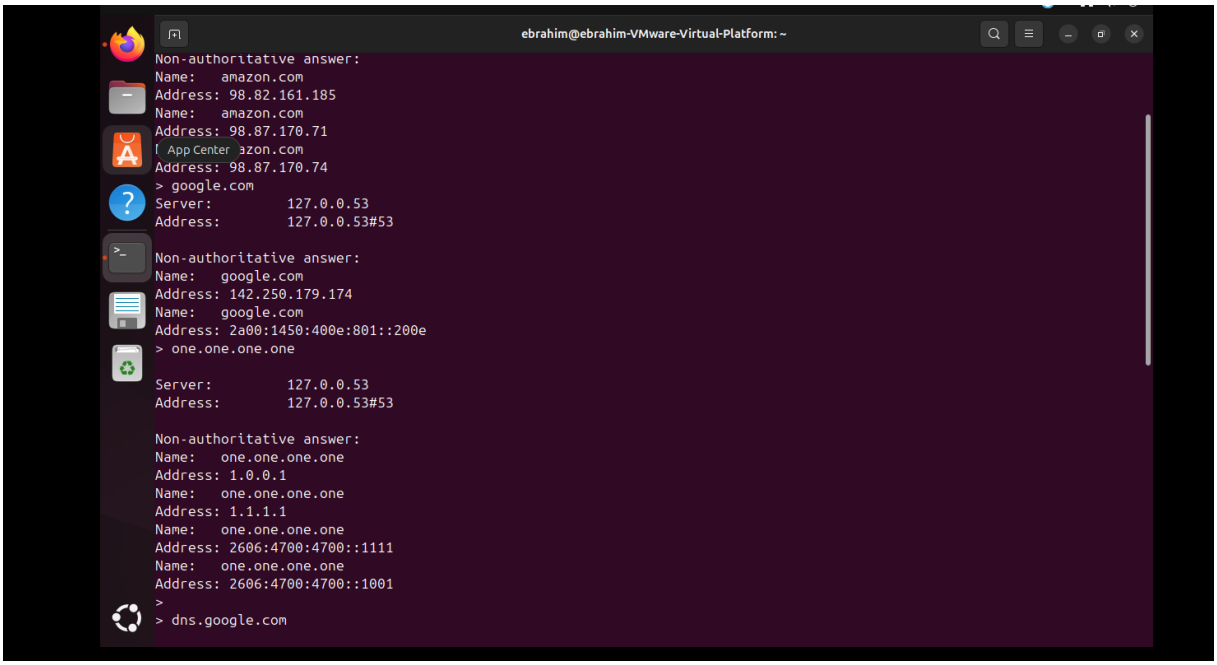


Assignment 6.2: IP addresses websites

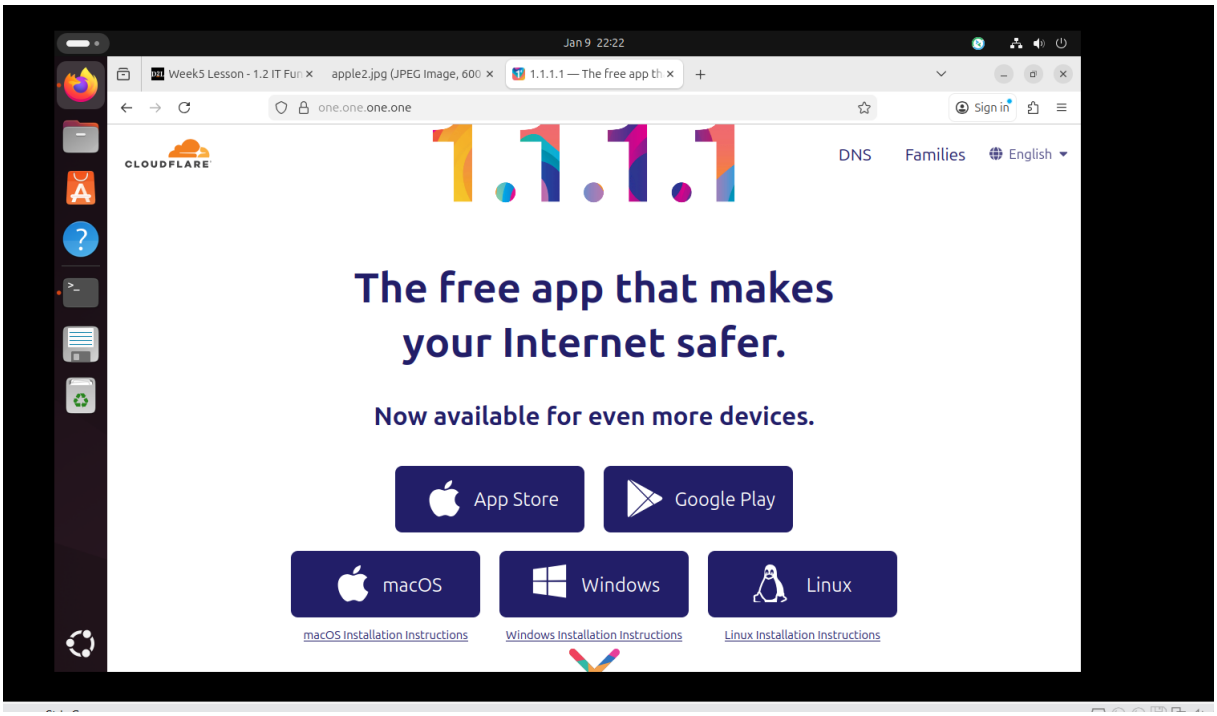
Relevant screenshots nslookup command:



inside or press Ctrl+G.



Screenshot website visit via IP address:



Assignment 6.3: subnetting

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

A /25 subnet leaves 7 bits for host addresses. This gives 2^7 = **128 total IP addresses**.

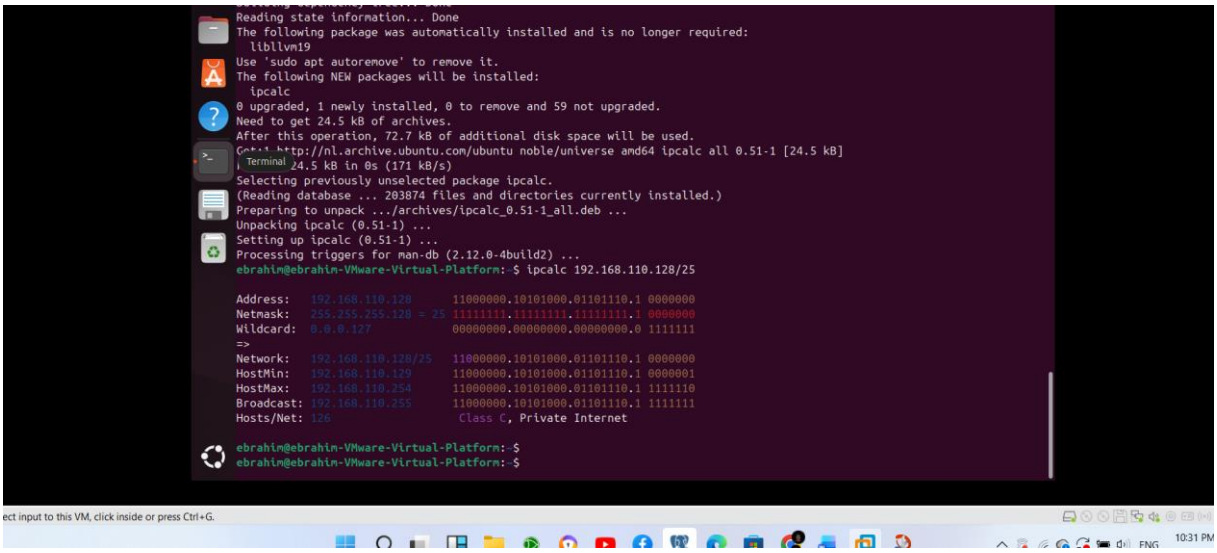
What is the usable IP range to hand out to the connected computers?

The network address is **192.168.110.128** and the broadcast address is **192.168.110.255**.
These two cannot be used by devices.
The usable IP range is:

192.168.110.129 – 192.168.110.254
This gives **126 usable host addresses**.

.

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

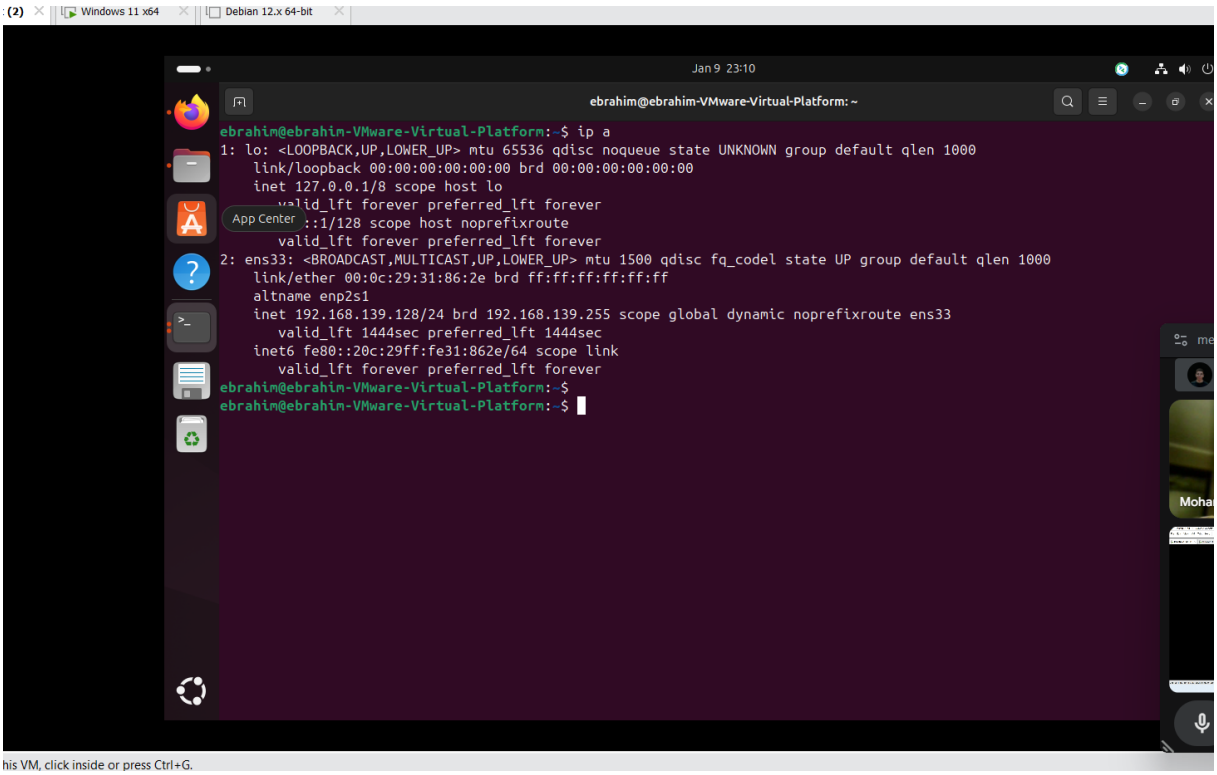


Explain the above calculation in your own words.

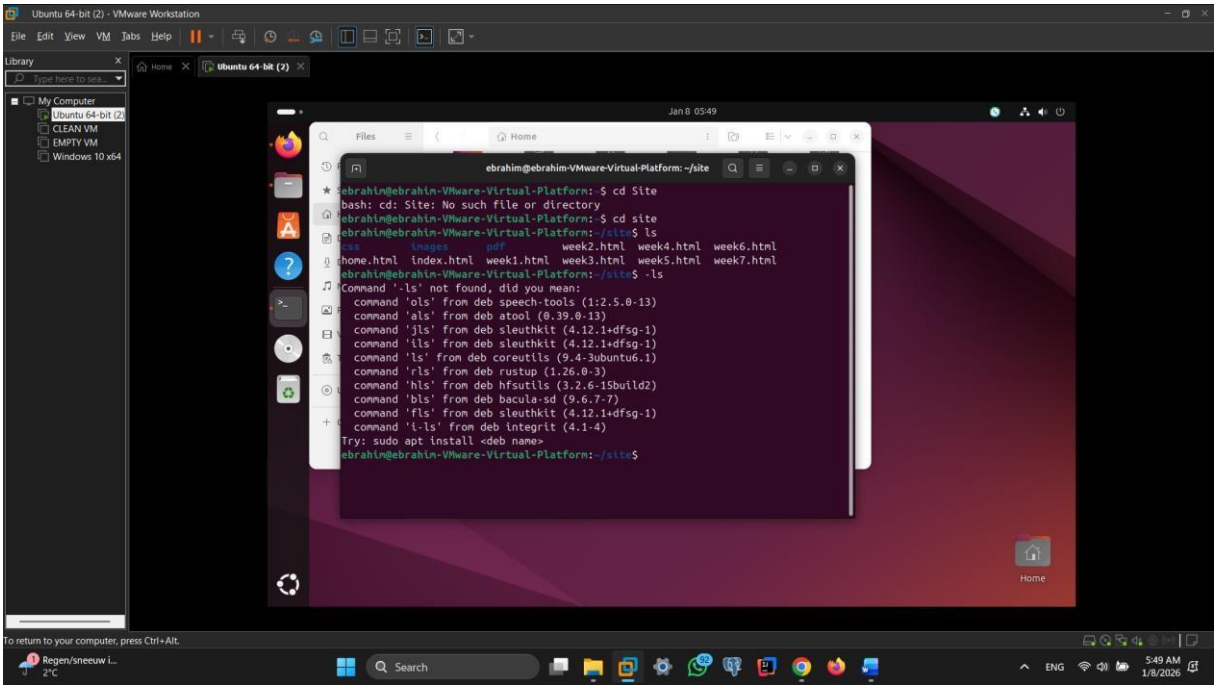
The first address is the network address and the last address is the broadcast address, so they cannot be used by devices.
This leaves **126 usable IP addresses**, ranging from **192.168.110.129 to 192.168.110.254**.
The network address is **192.168.110.128** and the broadcast address is **192.168.110.255**.
The result was confirmed using the **ipcalc 192.168.110.128/25** command.

Assignment 6.4: HTML

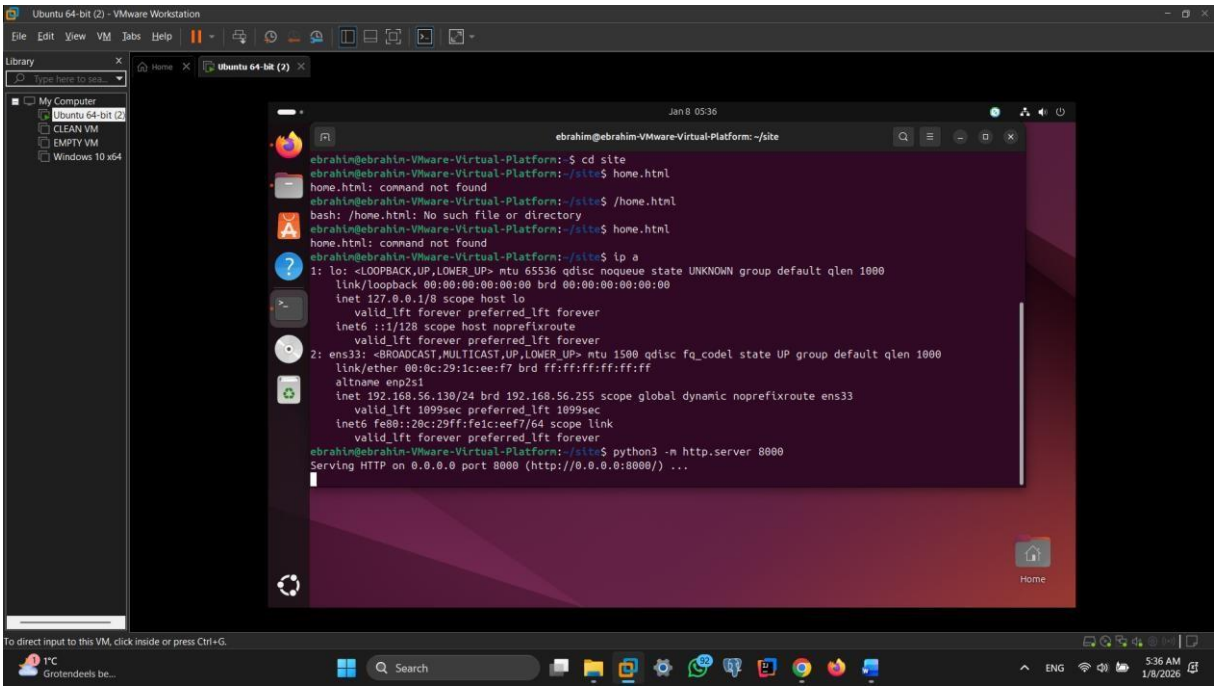
Screenshot IP address Ubuntu VM:



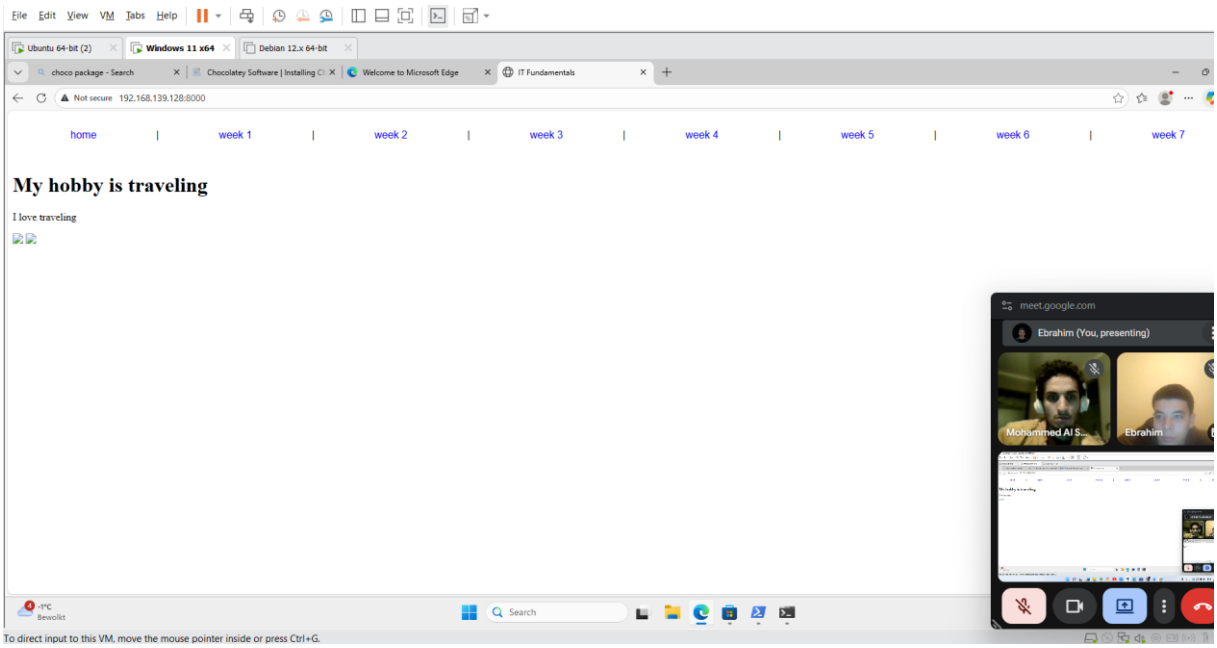
Screenshot of Site directory contents:



Screenshot python3 webserver command:



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.

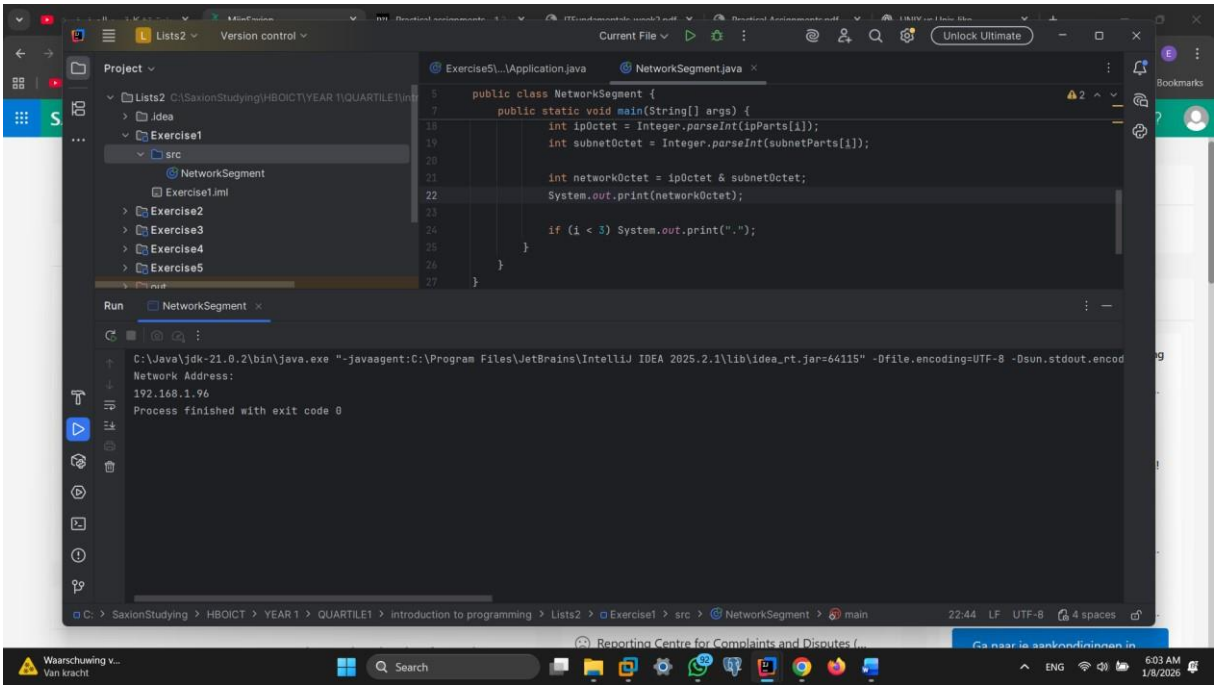
IP: 192.168.1.100 and subnet: 255.255.255.224 for /27

```
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 (2⁵).
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.

```
public class NetworkSegment {


        public static void main(String[] args) {


            String ip = "192.168.1.100";
```

```
String subnet = "255.255.255.224";

String[] ipParts = ip.split("\\.");
String[] subnetParts =
subnet.split("\\.");

System.out.println("Network
Address:");

for (int i = 0; i < 4;
i++) {

int ipOctet =
Integer.parseInt(ipParts[i]);

int subnetOctet =
Integer.parseInt(subnetParts[i]);
```



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