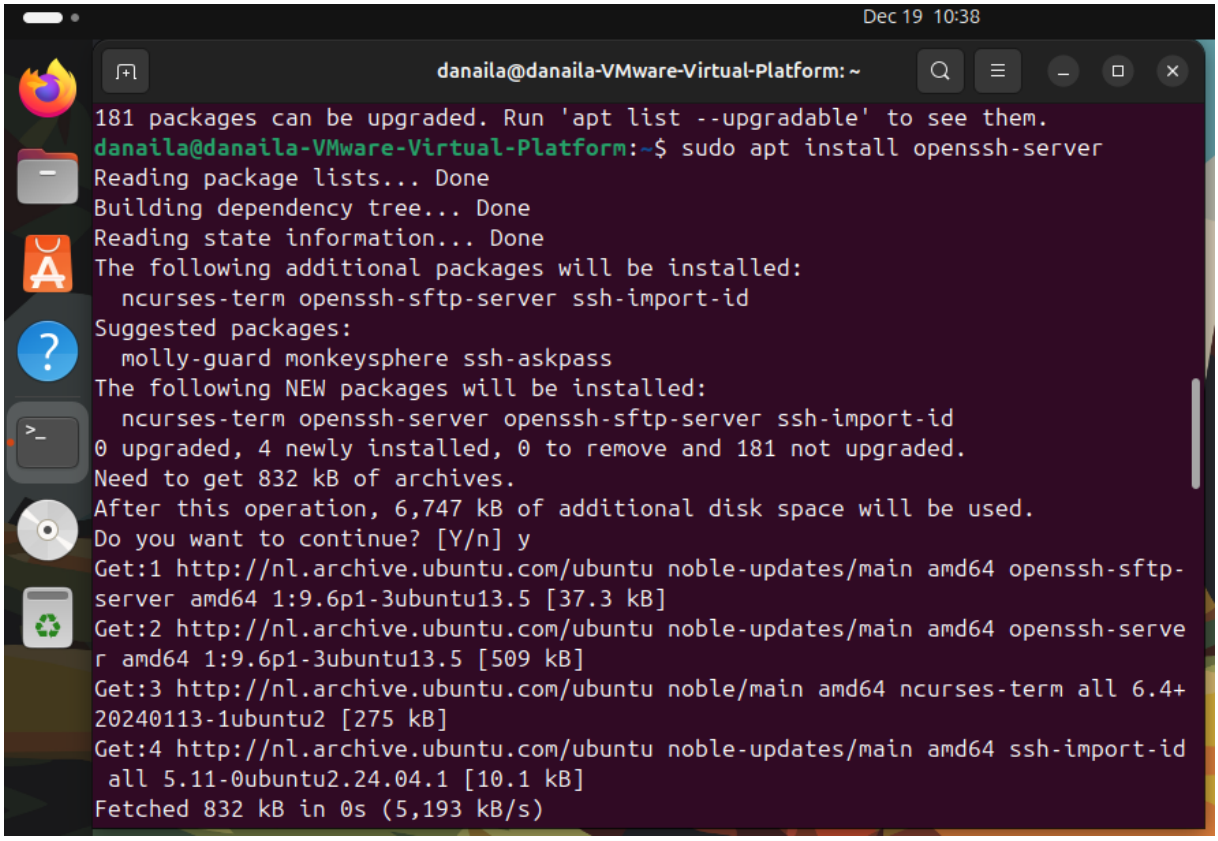
Template Week 6 – Networking

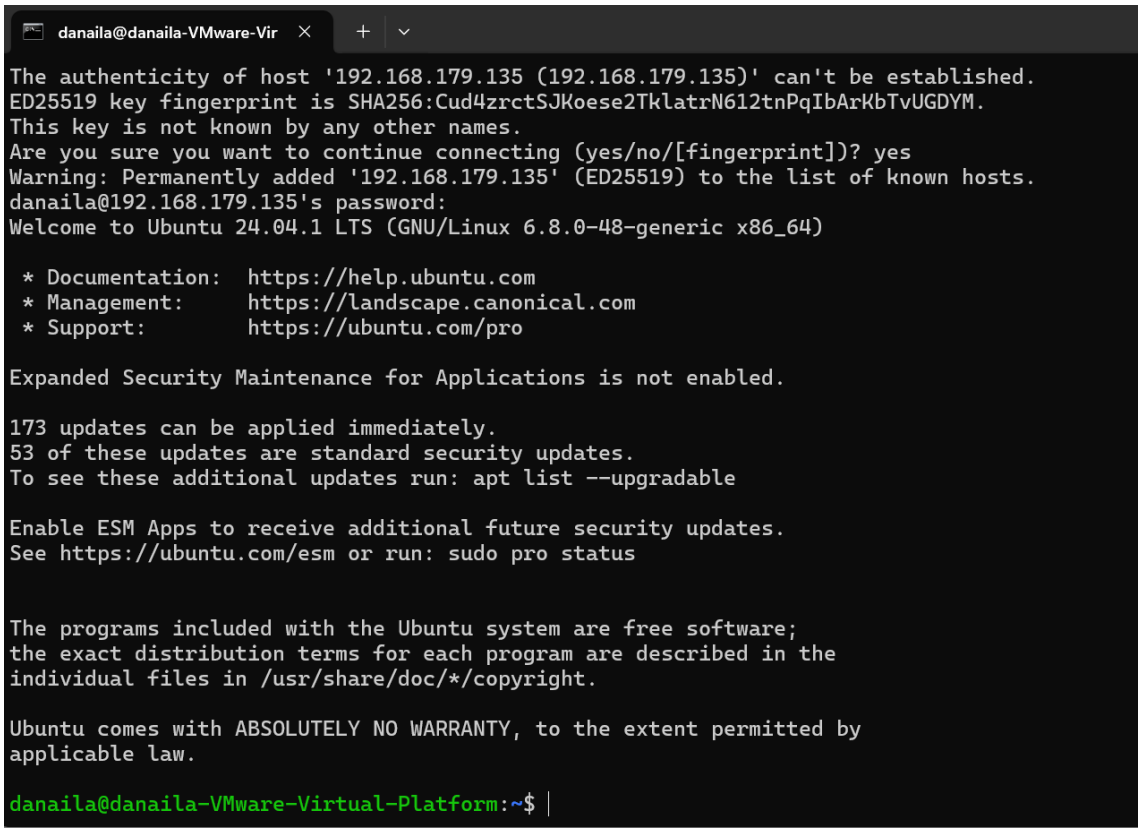
Student number: 562606

Assignment 6.1: Working from home

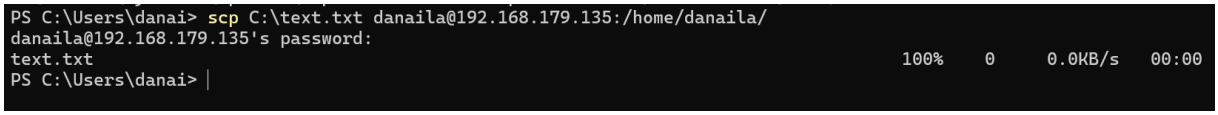
Screenshot installation openssh-server:

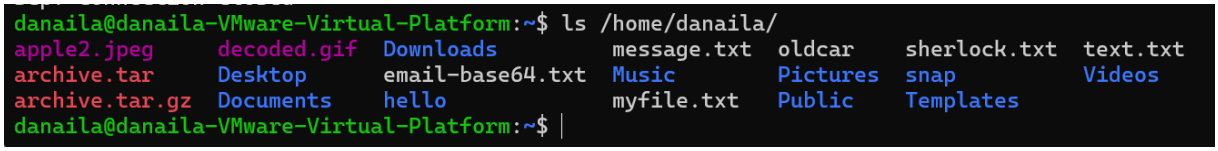


Screenshot successful SSH command execution:

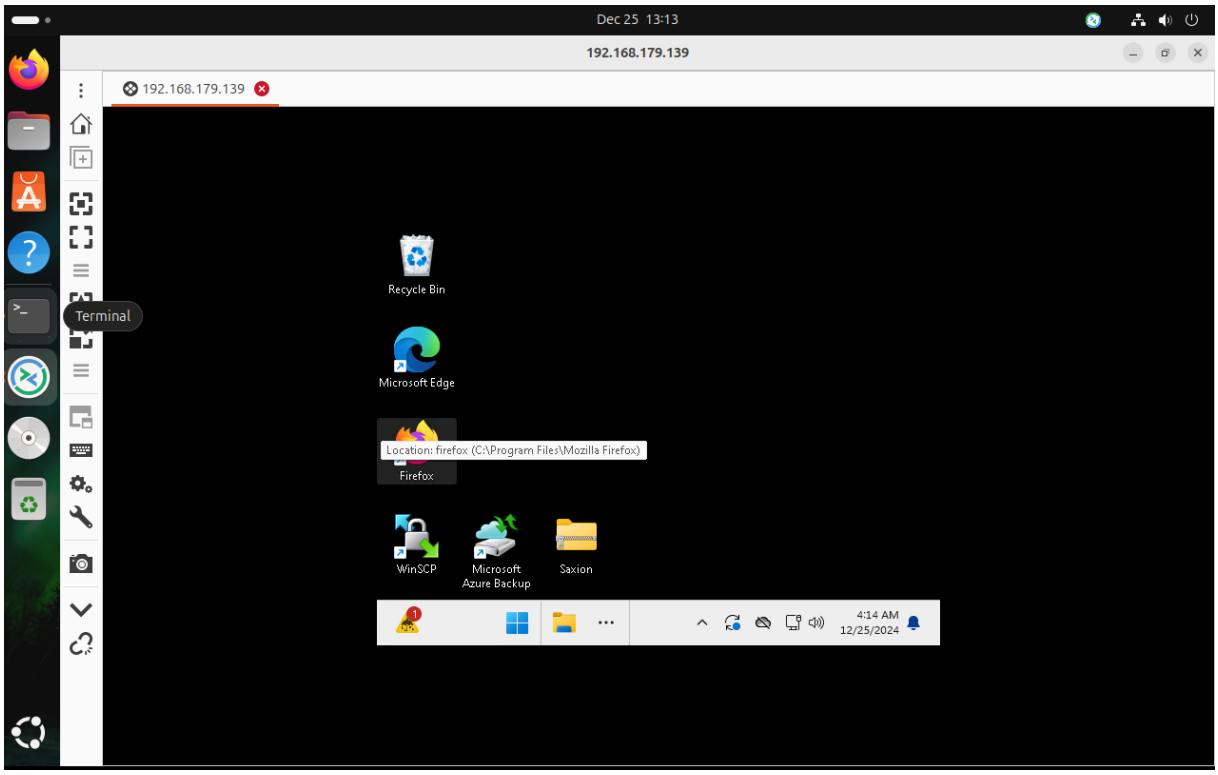


Screenshot successful execution SCP command:





Screenshot remmina:



Assignment 6.2: IP addresses websites

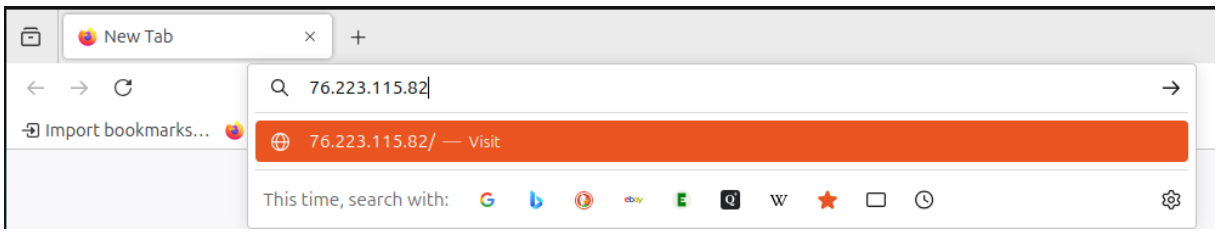
Relevant screenshots nslookup command:

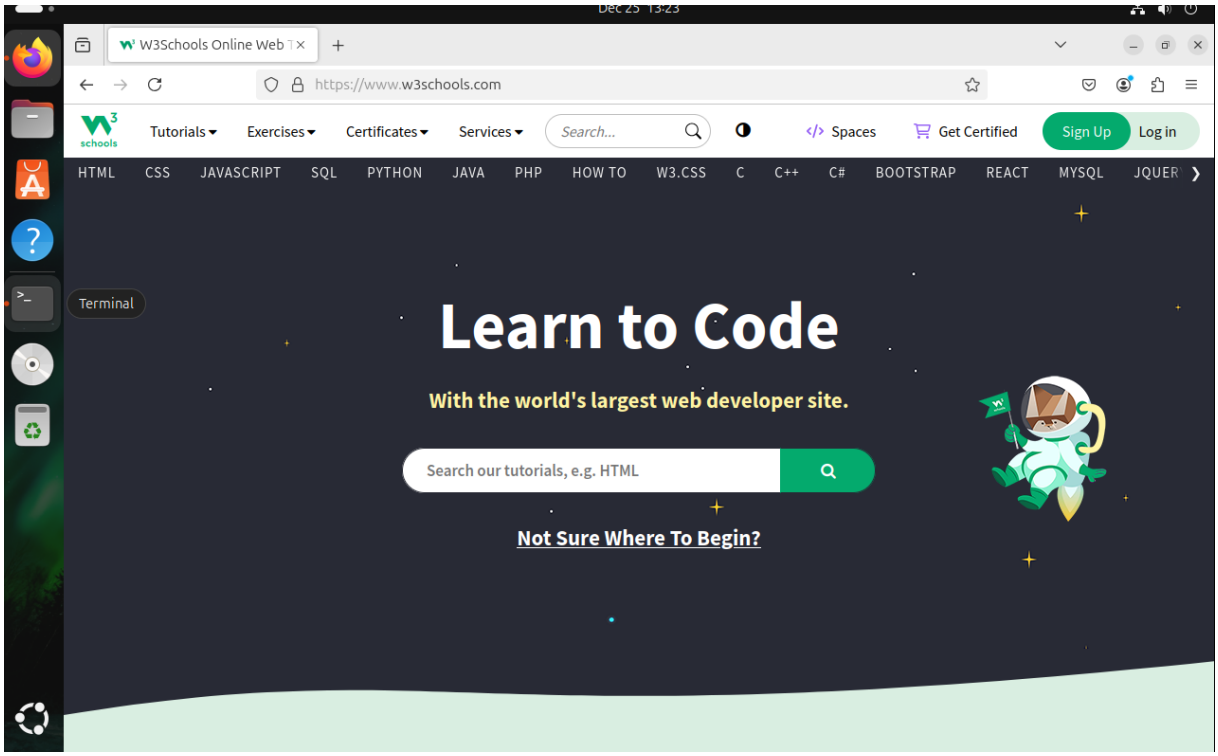
```
danaila@danaila-VMware-Virtual-Platform:~$ nslookup
> amazon.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   amazon.com
Address: 52.94.236.248
Name:   amazon.com
Address: 54.239.28.85
Name:   amazon.com
Address: 205.251.242.103
> google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 172.217.17.142
Name:   google.com
Address: 2a00:1450:4017:811::200e
```

```
> one.one.one.one
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   one.one.one.one
Address: 1.1.1.1
Name:   one.one.one.one
Address: 1.0.0.1
Name:   one.one.one.one
Address: 2606:4700:4700::1111
Name:   one.one.one.one
Address: 2606:4700:4700::1001
> 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: 34.36.121.47
> 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
>
```

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 IP addresses

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

192.168.110.129 - 192.168.110.254

Check your two previous answers with this calculator:
https://www.calculator.net/ip-subnet-calculator.html

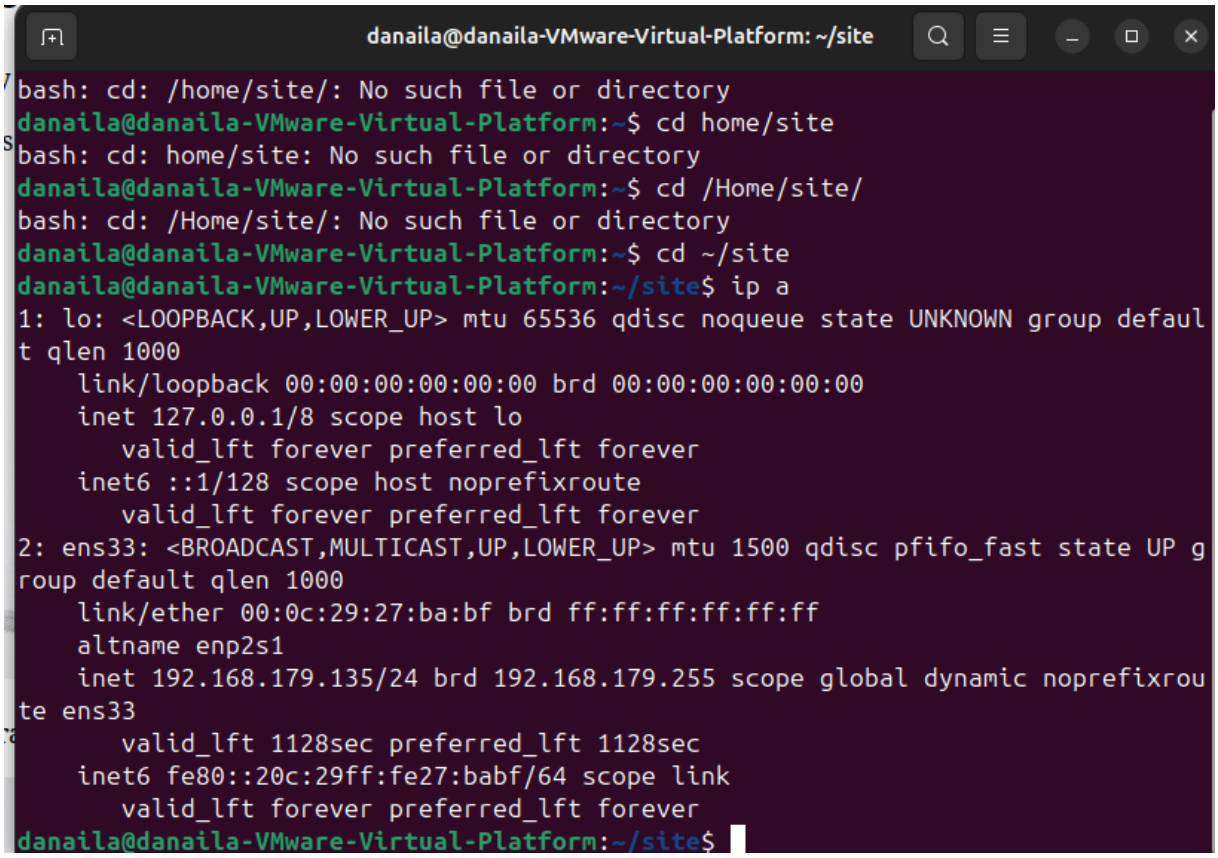
Explain the above calculation in your own words.

The port number of the network configuration is 25 while IP addresses are 32-bit which means that there are 7 left (32-25). The number of IP addresses is calculated by putting 2 to the power of seven which results in 128.

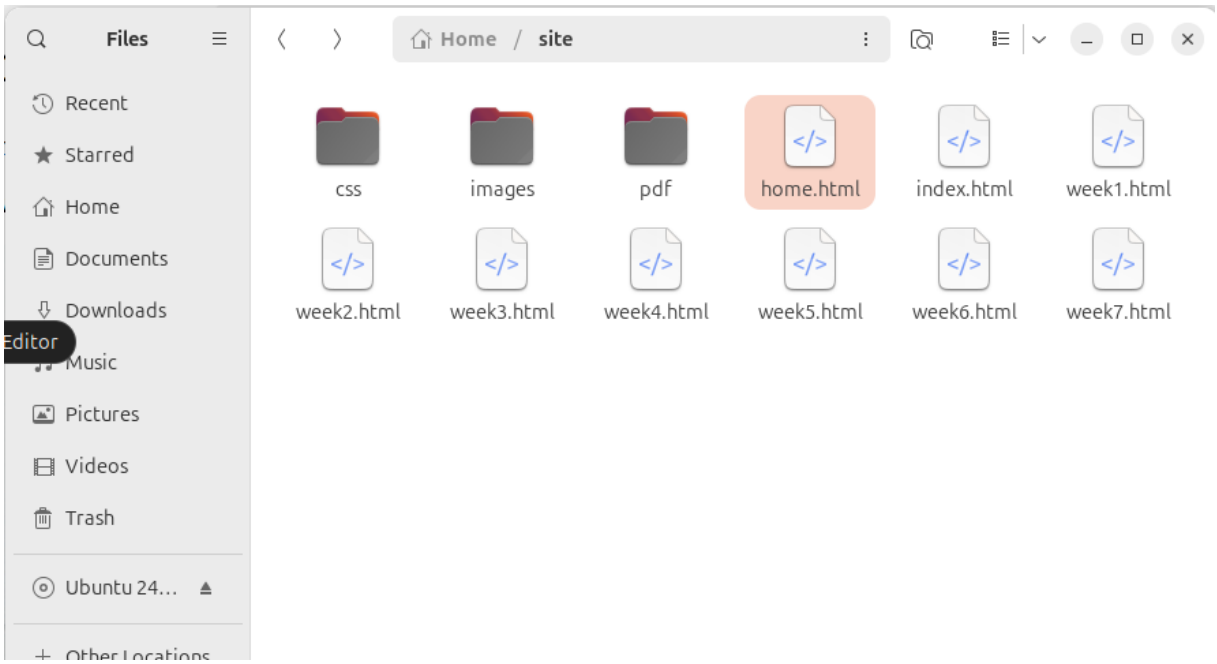
The broadcast address in this range is 192.168.110.255 which is not usable as the network address and the range of the usable ones is between these two numbers: 192.168.110.129 - 192.168.110.254

Assignment 6.4: HTML

Screenshot IP address Ubuntu VM:



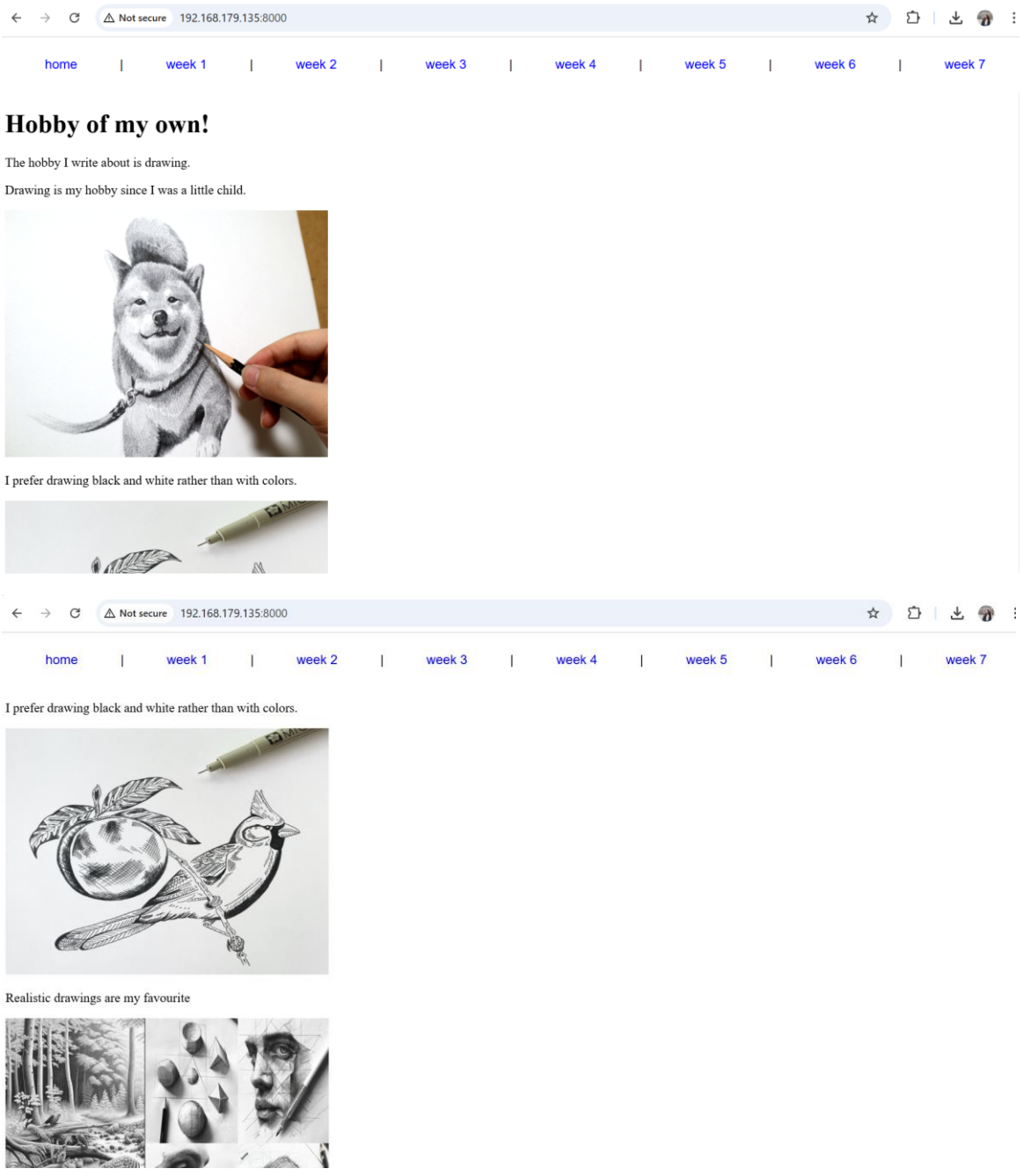
Screenshot of Site directory contents:



Screenshot python3 webserver command:

```
danaila@danaila-VMware-Virtual-Platform:~/site$ python3 -m http.server 8000
Serving HTTP on 0.0.0.0 port 8000 (http://0.0.0.0:8000/) ...
192.168.179.1 - - [25/Dec/2024 13:57:46] "GET / HTTP/1.1" 200 -
192.168.179.1 - - [25/Dec/2024 13:57:46] "GET /home.html HTTP/1.1" 200 -
192.168.179.1 - - [25/Dec/2024 13:57:46] "GET /css/mypdfstyle.css HTTP/1.1" 200
-
192.168.179.1 - - [25/Dec/2024 13:57:46] "GET /images/original.jpeg HTTP/1.1" 20
0 -
192.168.179.1 - - [25/Dec/2024 13:57:46] "GET /images/image2.jpg HTTP/1.1" 200 -
192.168.179.1 - - [25/Dec/2024 13:57:46] "GET /images/bro.jpg HTTP/1.1" 200 -
192.168.179.1 - - [25/Dec/2024 13:57:46] code 404, message File not found
192.168.179.1 - - [25/Dec/2024 13:57:46] "GET /favicon.ico HTTP/1.1" 404 -
```

Screenshot web browser visits your site



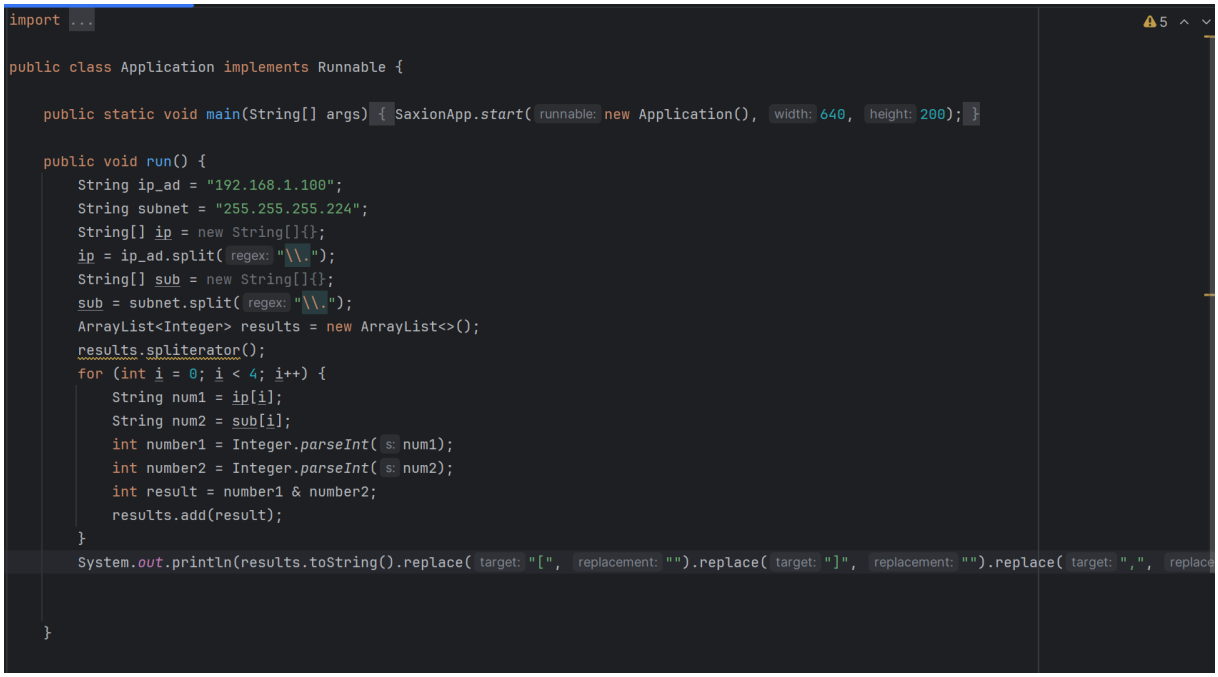
Bonus point assignment – week 6

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.

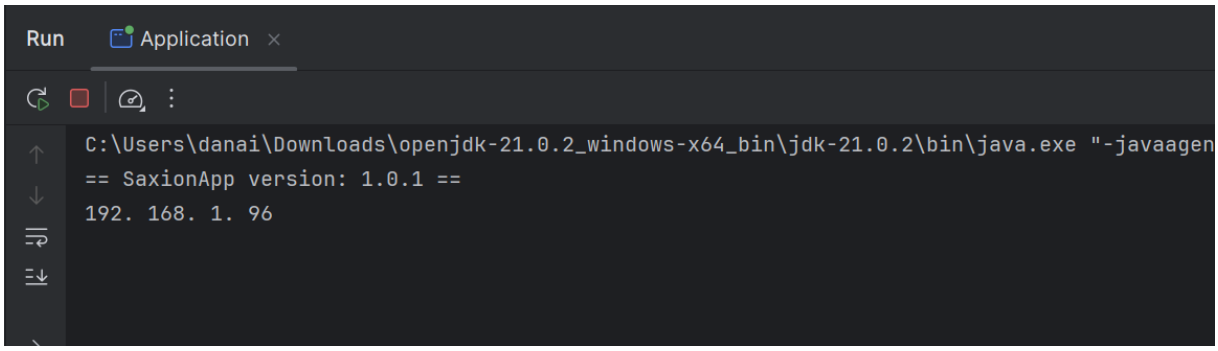
IP: 192.168.1.100 and subnet: 255.255.255.224 for /27

```
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.



```
import ...

public class Application implements Runnable {

    public static void main(String[] args) { SaxionApp.start( runnable: new Application(),  width: 640,  height: 200); }

    public void run() {
        String ip_ad = "192.168.1.100";
        String subnet = "255.255.255.224";
        String[] ip = new String[]{};
        ip = ip_ad.split( regex: "\\.");
        String[] sub = new String[]{};
        sub = subnet.split( regex: "\\.");
        ArrayList<Integer> results = new ArrayList<>();
        results.spliterator();
        for (int i = 0; i < 4; i++) {
            String num1 = ip[i];
            String num2 = sub[i];
            int number1 = Integer.parseInt( s: num1);
            int number2 = Integer.parseInt( s: num2);
            int result = number1 & number2;
            results.add(result);
        }
        System.out.println(results.toString().replace( target: "[",  replacement: "").replace( target: "]",  replacement: "").replace( target: ",",  replace

    }
```



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