

Template Week 6 – Networking

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Assignment 6.1: Working from home

Screenshot installation openssh-server:

```
inet6 fe80::20c:29ff:fe89:7047/64 scope link
valid_lft forever preferred_lft forever
maks@maks-VMware-Virtual-Platform:~/Downloads$ sudo apt-get install open-ssh-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package open-ssh-server
maks@maks-VMware-Virtual-Platform:~/Downloads$
```

Screenshot successful SSH command execution:

```
Are you sure you want to continue connecting (yes/no) [ping-ping] yes
Warning: Permanently added '192.168.54.135' (ED25519) to the list of known hosts.
maks@192.168.54.135's password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-50-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

Expanded Security Maintenance for Applications is not enabled.

154 updates can be applied immediately.
29 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

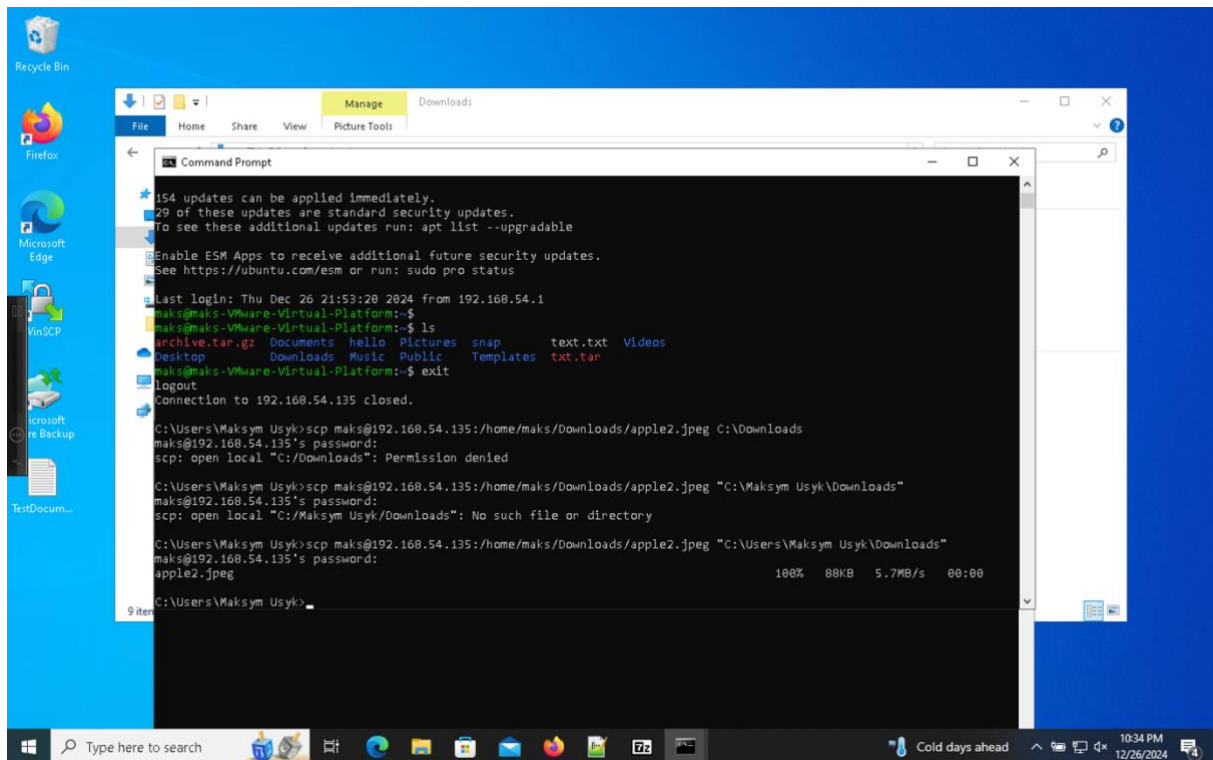
Last login: Thu Dec 26 21:53:20 2024 from 192.168.54.1
maks@maks-VMware-Virtual-Platform:~$
maks@maks-VMware-Virtual-Platform:~$ ls
archive.tar.gz  Documents  hello  Pictures  snap      text.txt  Videos
Desktop         Downloads  Music  Public   Templates txt.tar
maks@maks-VMware-Virtual-Platform:~$
```

Screenshot successful execution SCP command:

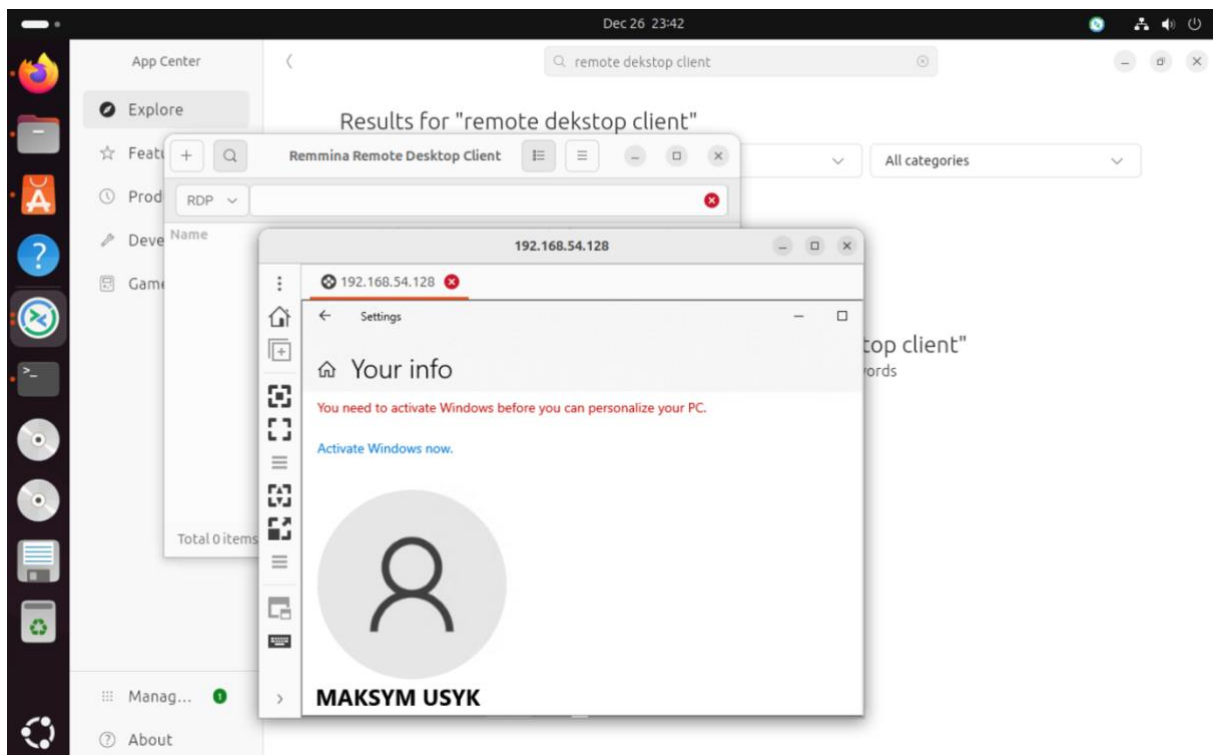
```
maks@maks-VMware-Virtual-Platform:~$ ls
archive.tar.gz  Documents  hello  Pictures  snap      text.txt  Videos
Desktop         Downloads  Music  Public   Templates txt.tar
maks@maks-VMware-Virtual-Platform:~$ cd Downloads/
maks@maks-VMware-Virtual-Platform:~/Downloads$ ls
apple2.jpeg  email-base64.txt  file.gif  oldcar  oldcar.jpg  sherlock.txt
maks@maks-VMware-Virtual-Platform:~/Downloads$ logout
Connection to 192.168.54.135 closed.

C:\Users\Maksym Usyk>scp "C:\Users\Maksym Usyk\Downloads\Wave.png" maks@192.168.54.135:/home/maks/Downloads
maks@192.168.54.135's password:
Wave.png                                           100% 351KB 21.4MB/s 00:00

C:\Users\Maksym Usyk>
```

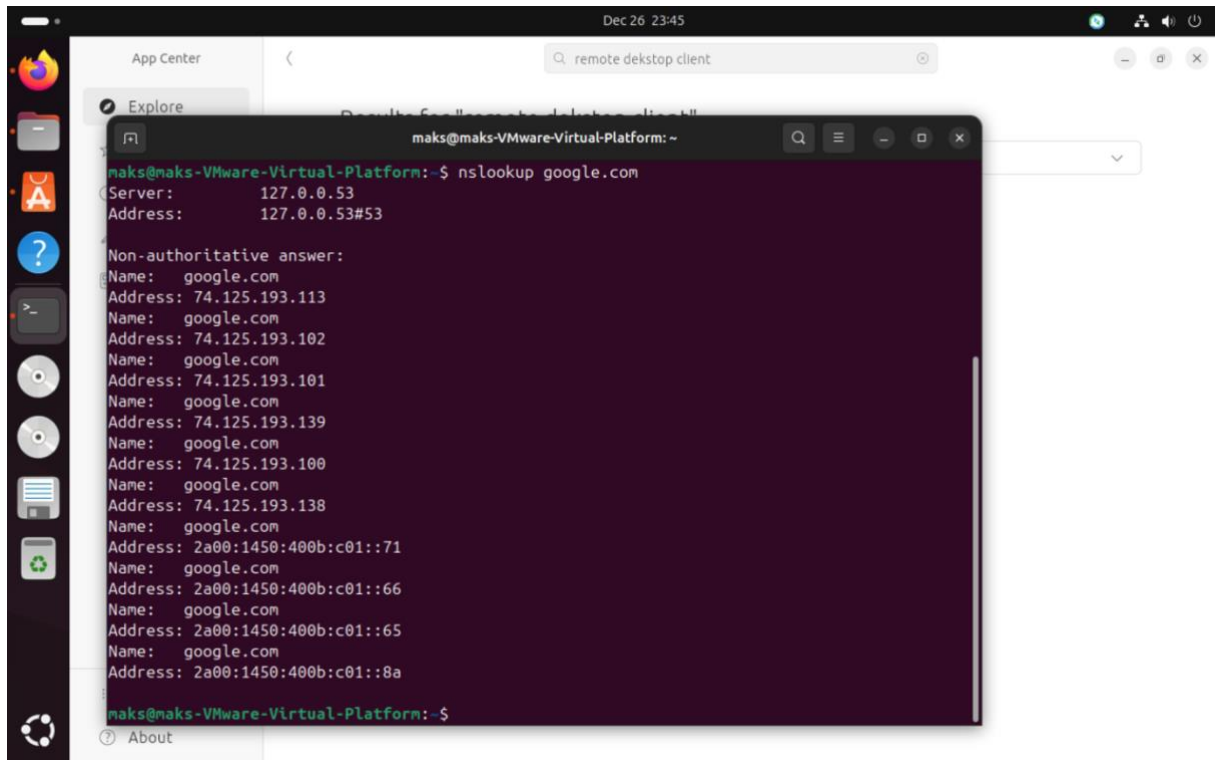


Screenshot remmina:



Assignment 6.2: IP addresses websites

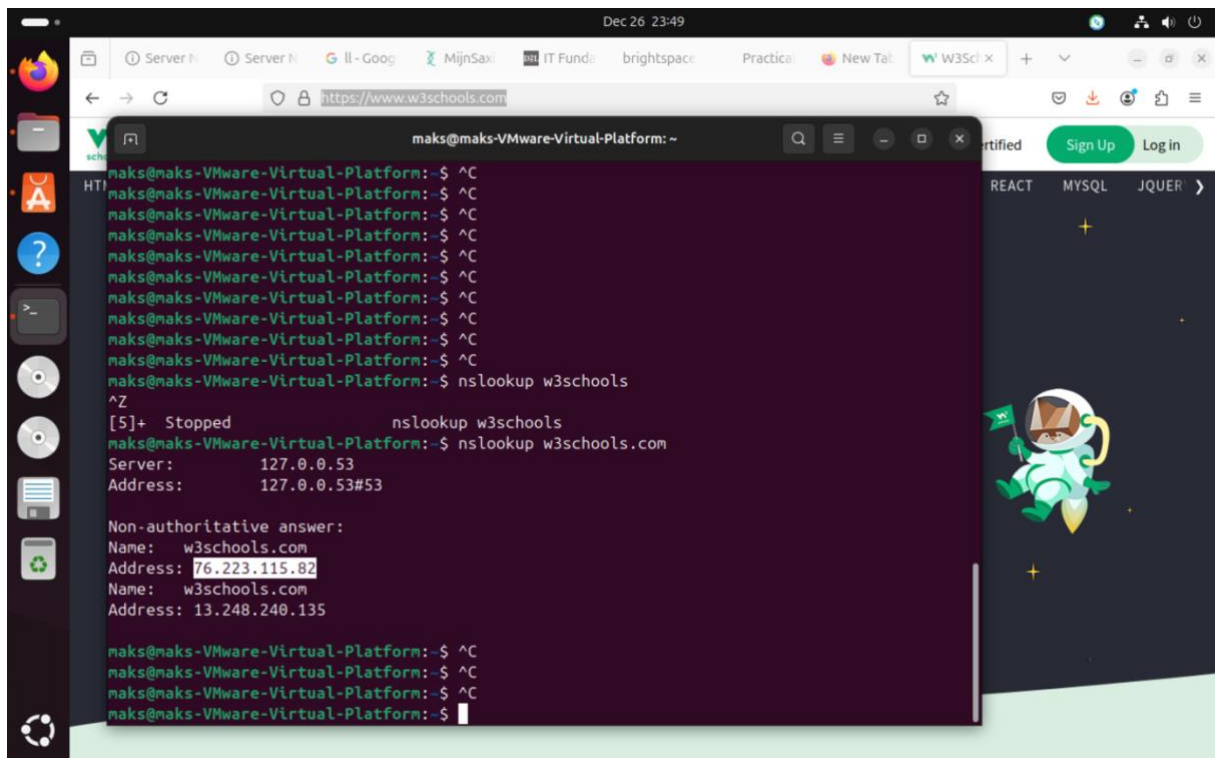
Relevant screenshots nslookup command:



The screenshot shows a terminal window titled 'maks@maks-VMware-Virtual-Platform: ~'. The user has entered the command 'nslookup google.com'. The output shows the server address as 127.0.0.53 and the IP address for google.com as 74.125.193.113. The terminal also displays a non-authoritative answer for google.com with multiple IP addresses.

```
maks@maks-VMware-Virtual-Platform: ~  
maks@maks-VMware-Virtual-Platform:~$ nslookup google.com  
Server:      127.0.0.53  
Address:     127.0.0.53#53  
  
Non-authoritative answer:  
Name:   google.com  
Address: 74.125.193.113  
Name:   google.com  
Address: 74.125.193.102  
Name:   google.com  
Address: 74.125.193.101  
Name:   google.com  
Address: 74.125.193.139  
Name:   google.com  
Address: 74.125.193.100  
Name:   google.com  
Address: 74.125.193.138  
Name:   google.com  
Address: 2a00:1450:400b:c01::71  
Name:   google.com  
Address: 2a00:1450:400b:c01::66  
Name:   google.com  
Address: 2a00:1450:400b:c01::65  
Name:   google.com  
Address: 2a00:1450:400b:c01::8a  
maks@maks-VMware-Virtual-Platform:~$
```

Screenshot website visit via IP address:



The screenshot shows a terminal window titled 'maks@maks-VMware-Virtual-Platform: ~'. The user has entered the command 'nslookup w3schools.com'. The output shows the server address as 127.0.0.53 and the IP address for w3schools.com as 76.223.115.82. The terminal also displays a non-authoritative answer for w3schools.com with multiple IP addresses.

```
maks@maks-VMware-Virtual-Platform: ~  
maks@maks-VMware-Virtual-Platform:~$ nslookup w3schools  
[5]+  Stopped                  nslookup w3schools  
maks@maks-VMware-Virtual-Platform:~$ nslookup 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  
maks@maks-VMware-Virtual-Platform:~$
```

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:

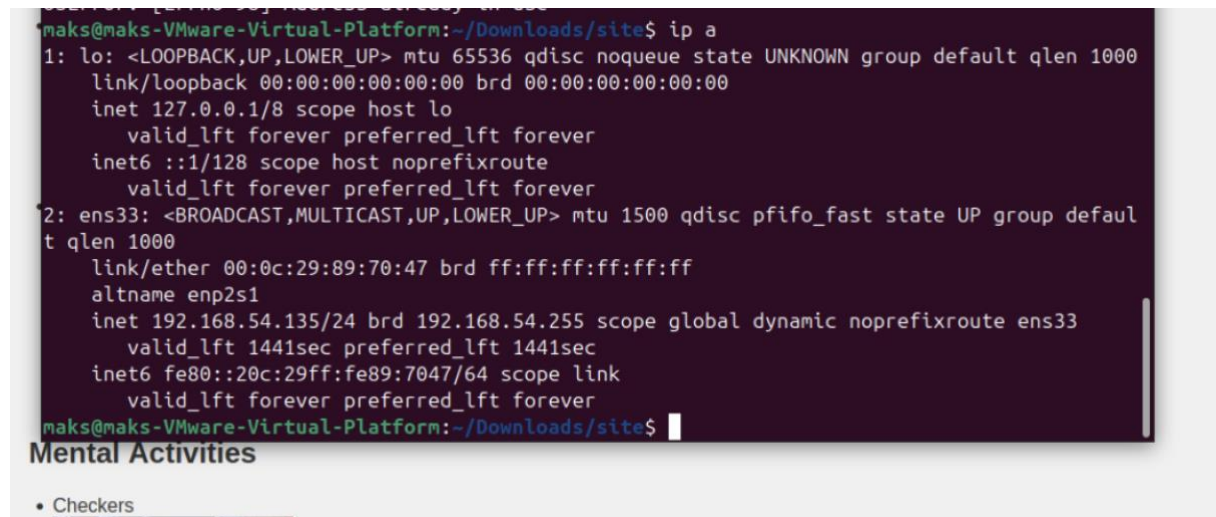
<https://www.calculator.net/ip-subnet-calculator.html>

Explain the above calculation in your own words.

2 ip addresses are reserved. First is the network ip address and the other is the broadcast address.

Assignment 6.4: HTML

Screenshot IP address Ubuntu VM:

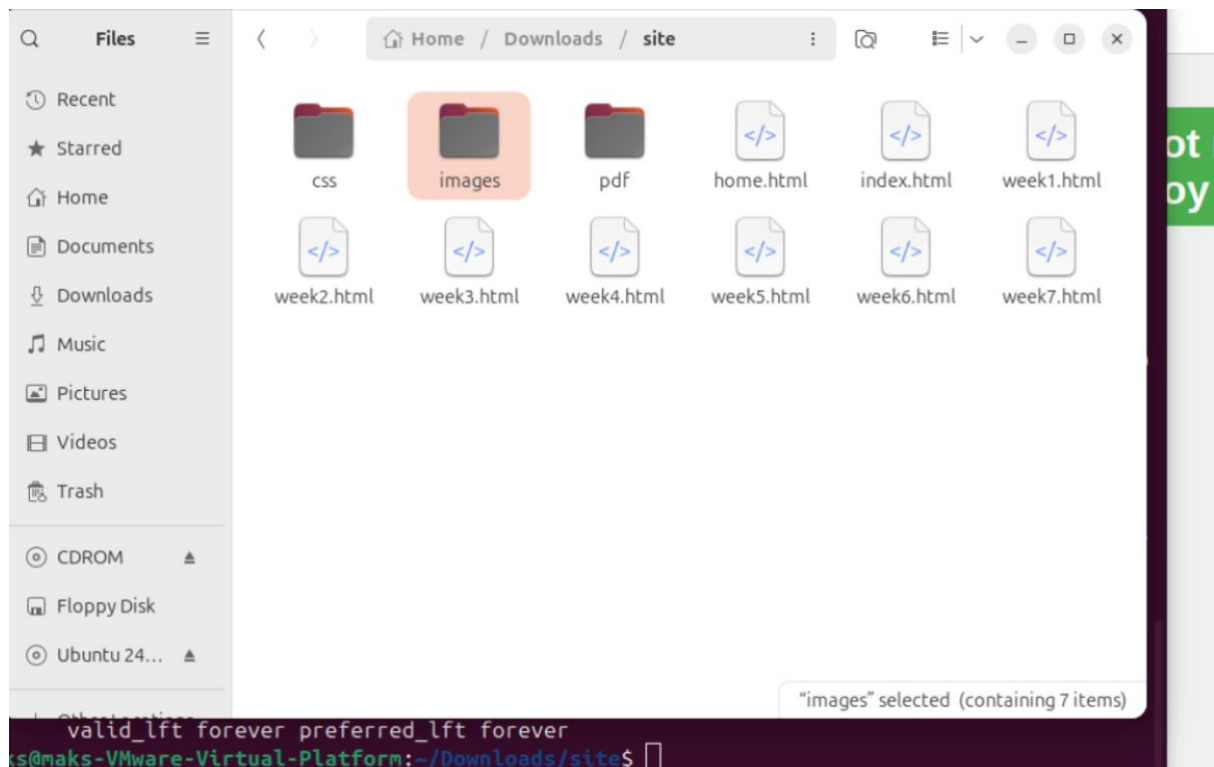


```
maks@maks-VMware-Virtual-Platform:~/Downloads/site$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:0c:29:89:70:47 brd ff:ff:ff:ff:ff:ff
    altname enp2s1
    inet 192.168.54.135/24 brd 192.168.54.255 scope global dynamic noprefixroute ens33
        valid_lft 1441sec preferred_lft 1441sec
    inet6 fe80::20c:29ff:fe89:7047/64 scope link
        valid_lft forever preferred_lft forever
maks@maks-VMware-Virtual-Platform:~/Downloads/site$
```

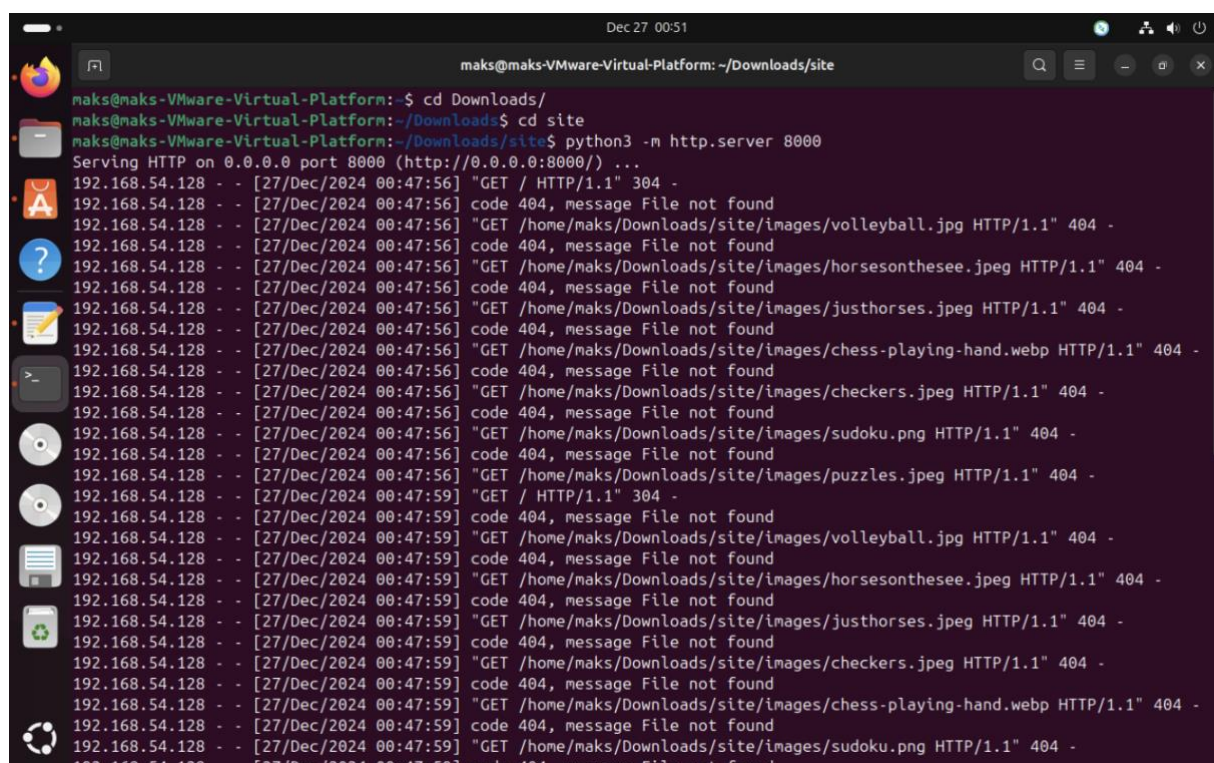
Mental Activities

- Checkers

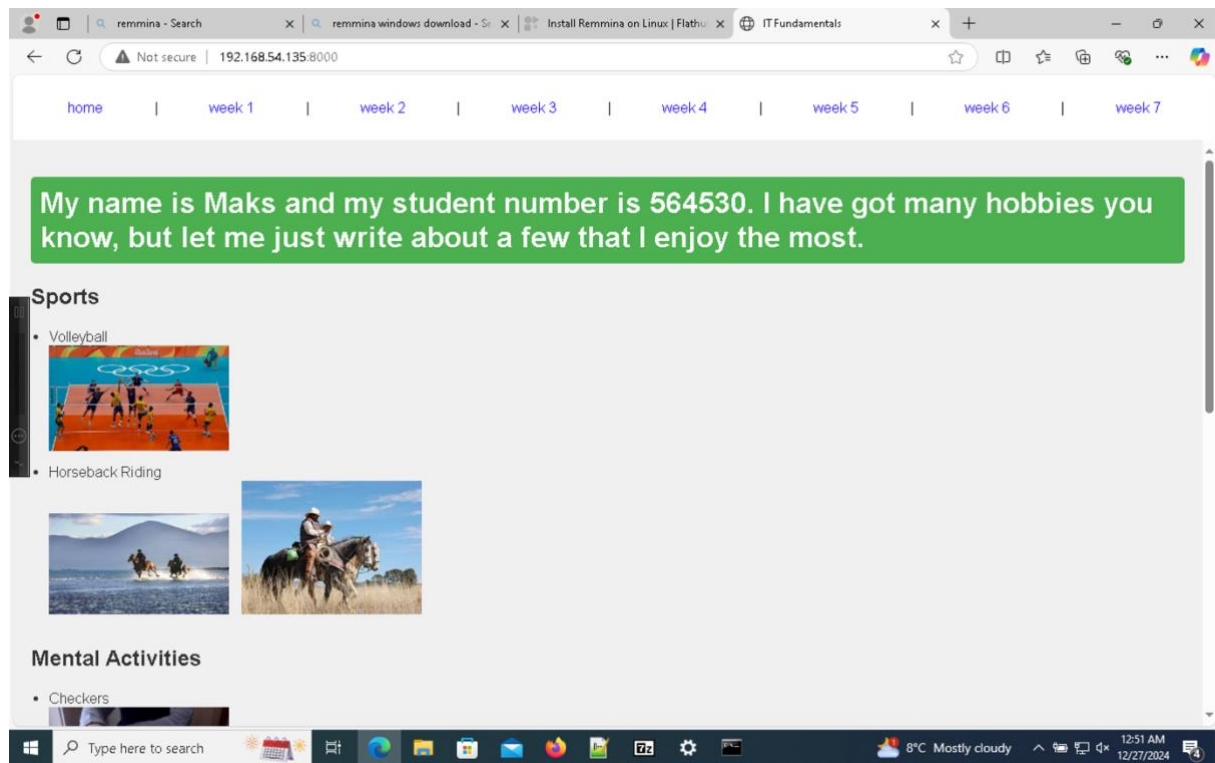
Screenshot of Site directory contents:



Screenshot python3 webserver command:



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 (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.

