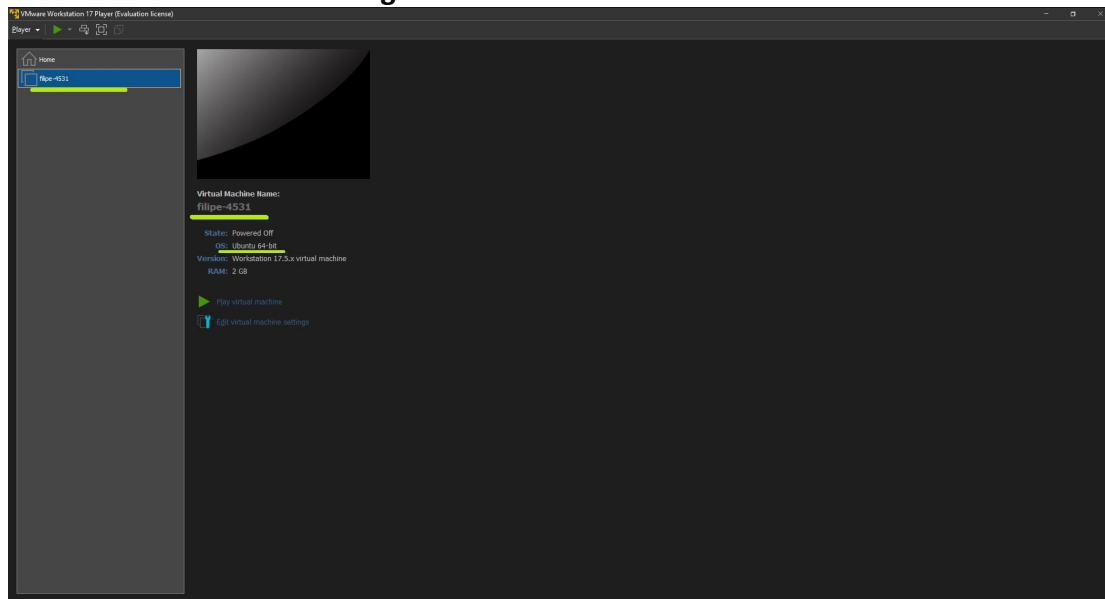


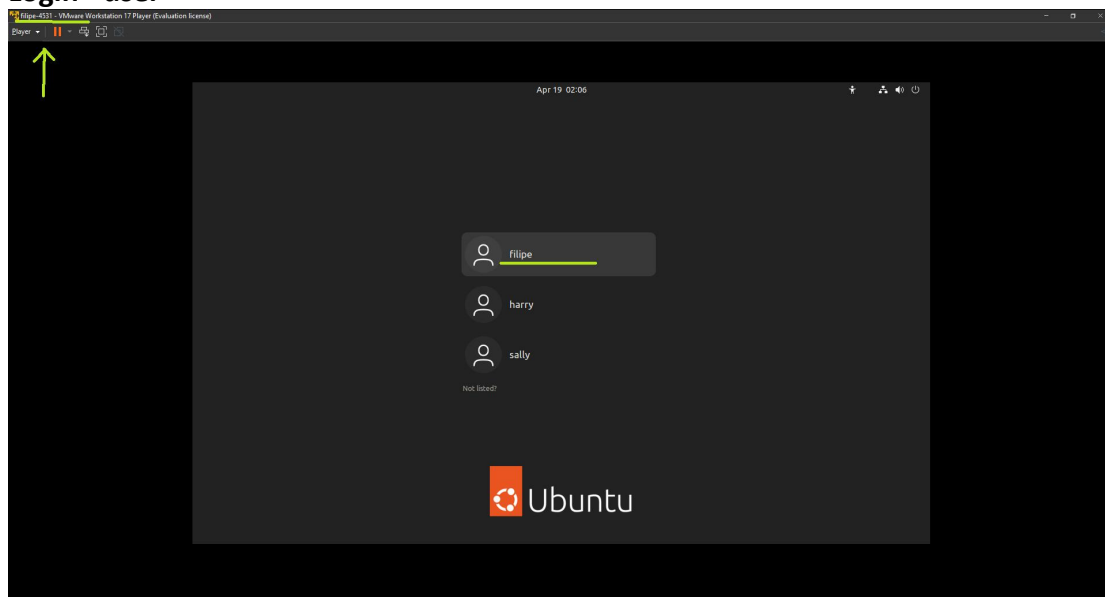
Assignment 1- Install Ubuntu

Pt1-

Creation of VM and installing Linux



Login - user



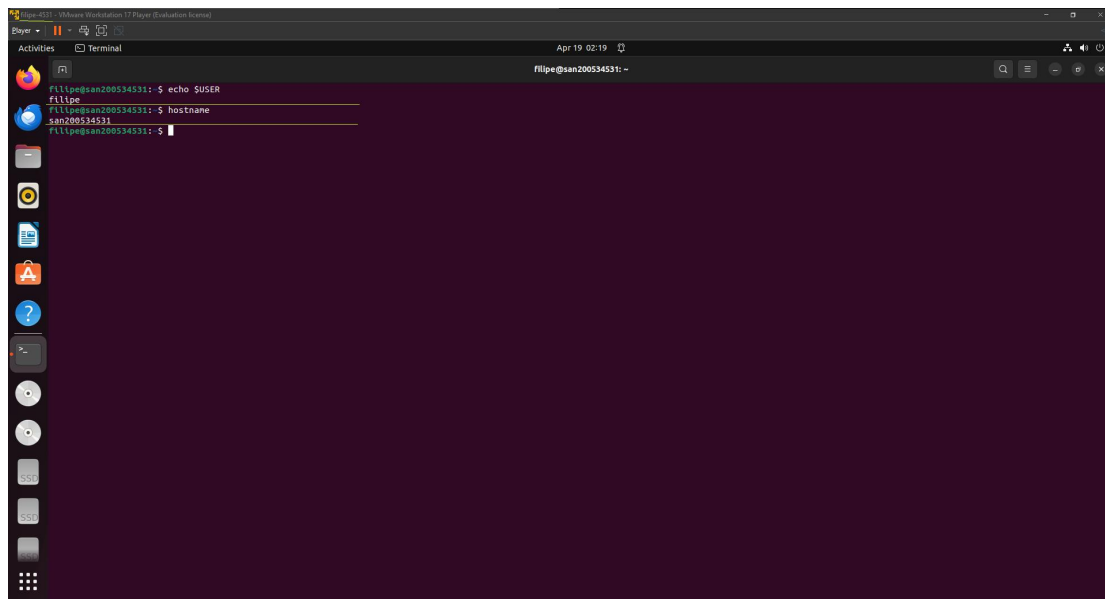
Pt2-

Set username to be my first name. Set hostname to be the first 3 letters of my last name + my student ID

User of command on terminal:

echo \$USER

hostname



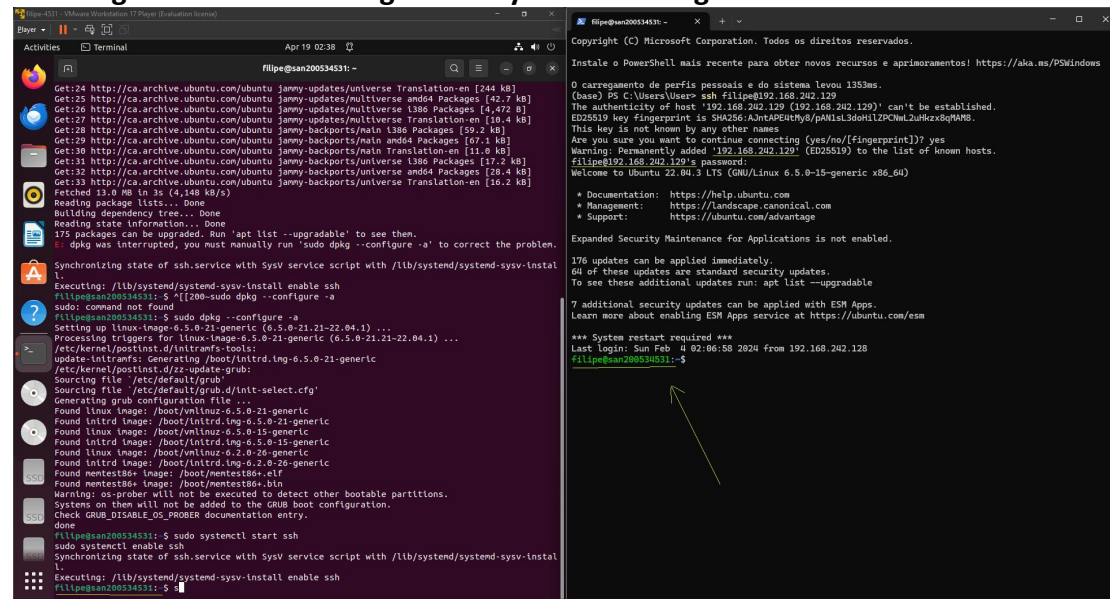
The screenshot shows a terminal window within a virtual machine environment. The terminal has a dark purple background. The prompt is `filipe@san200534531: ~`. The following commands and their outputs are shown:

```
filipe@san200534531: ~ $ echo $USER
filipe
filipe@san200534531: ~ $ hostname
san200534531
filipe@san200534531: ~ $
```

The left sidebar of the virtual machine shows various application icons, and the top bar indicates the date and time as 'Apr 19, 02:19'.

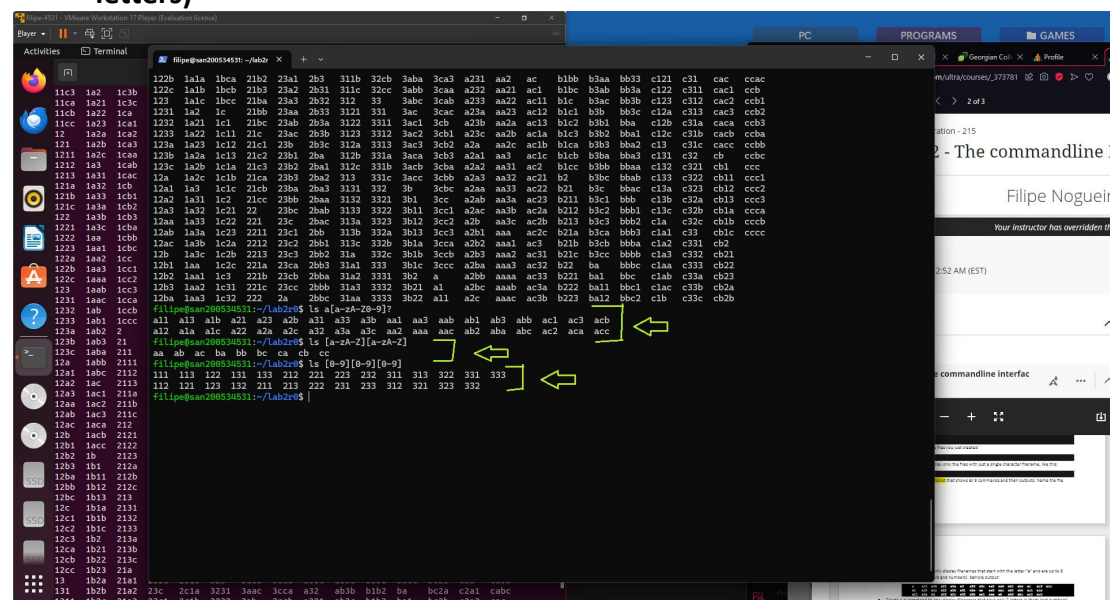
Assignment2 - The commandline interface

Enabling SSH and connecting remotely to VM through Windows Console



Pt1-

- Create a ls command to only display filenames that start with the letter “a” and are up to 3 characters long (any letters and numbers).
- Create a ls command to only display filenames that have only 2 letters in them (not numbers)
- Create a ls command to only display filenames that are 3-digit numbers (no letters)



Screenshot 1

Pt2- File and Folder management

(5 questions)

1- Create a directory under your lab2 directory called "dir_abc".

```
mkdir ~/lab2/dir_abc
```

2- Move all the files starting with letters a, b, or c into the "dir_abc" folder using mv command.

```
mv ~/lab2/[a-c]* ~/lab2/dir_abc/
```

3- Copy all the files starting with any number to a new folder called "numbers".

Although not mentioned, we first need to create another folder, as the step before, so

```
mkdir ~/lab2/numbers
```

and then we can use the following command

```
cp ~/lab2/[0-9]* ~/lab2/numbers/
```

4- Remove all the files under the lab2 folder that start with "12" using rm command.

```
rm ~/lab2/12*
```

5- Remove the "numbers" directory.

```
rm -r ~/lab2/numbers
```

Pt3 - Escaping special characters

Create an echo command to show the following output exactly as it is shown

```
122b 1a1a 1bca 21b2 23a1 2b3 311b 32cb 3aba 3ca3 a231 aa2 ac b1bb b3aa bb33 c121 c31 cac ccac
122c 1a1b 1bcb 21b3 23a2 2b31 311c 32cc 3abb 3caa a232 aa21 ac1 b1bc b3ab bb3a c122 c311 cac1 ccb
123 1a1c 1bcc 21ba 23a3 2b32 312 33 3abc 3cab a233 aa22 ac11 b1c b3ac bb3b c123 c312 cac2 ccb1
1231 1a2 1c 21bb 23aa 2b33 3121 331 3ac 3cac a23a aa23 ac12 b1c1 b3b bb3c c12a c313 cac3 ccb2
1232 1a21 1c1 21bc 23ab 2b3a 3122 3311 3ac1 3cb a23b aa2a ac13 b1c2 b3b1 bba c12b c31a caca ccb3
1233 1a22 1c11 21c 23ac 2b3b 3123 3312 3ac2 3cb1 a23c aa2b ac1a b1c3 b3b2 bba1 c12c c31b cacb ccb4
123a 1a23 1c12 21c1 23b 2b3c 312a 3313 3ac3 3cb2 a2a a2c ac1b b1ca b3b3 bba2 c13 c31c cacc ccb5
123b 1a2a 1c13 21c2 23b1 2ba 312b 331a 3aca 3cb3 a2a1 aa3 ac1c b1cb b3ba bba3 c131 c32 cb ccb6
123c 1a2b 1c1a 21c3 23b2 2ba1 312c 331b 3acb 3cba a2a2 aa31 ac2 b1cc b3bb bbaa c132 c321 cb1 ccc
12a 1a2c 1c1b 21ca 23b3 2ba2 313 331c 3acc 3cbb a2a3 aa32 ac21 b2 b3bc bba3 c133 c322 cb11 ccc1
12a1 1a3 1c1c 21cb 23ba 2ba3 3131 332 3b 3cbc a2aa aa33 ac22 b21 b3c bbac c13a c323 cb12 ccc2
12a2 1a31 1c2 21cc 23bb 2baa 3132 3321 3b1 3cc a2ab aa3a ac23 b211 b3c1 bbb c13b c32a cb13 ccc3
12a3 1a32 1c21 22 23bc 2bab 3133 3322 3b11 3cc1 a2ac aa3b ac2a b212 b3c2 bbb1 c13c c32b cb1a ccca
12aa 1a33 1c22 221 23c 2bac 313a 3323 3b12 3cc2 a2b aa3c ac2b b213 b3c3 bbb2 c1a c32c cb1b cccb
12ab 1a3a 1c23 2211 23c1 2bb 313b 332a 3b13 3cc3 a2b1 aaa ac2c b21a b3ca bbb3 c1a1 c33 cb1c cccc
12ac 1a3b 1c2a 2212 23c2 2bb1 313c 332b 3b1a 3cca a2b2 aa1 ac3 b21b b3cb bba c1a2 c331 cb2
12b 1a3c 1c2b 2213 23c3 2bb2 31a 332c 3b1b 3ccb a2b3 aa2 ac31 b1cc bbb3 c1a3 c332 cb21
12b1 1aa 1c2c 221a 23ca 2bb3 31a1 333 3b1c 3ccc a2ba aa3 ac32 b22 ba bbb4 c1aa c333 cb22
12b2 1aa1 1c3 221b 23cb 2bba 31a2 3331 3b2 a a2bb aaaa ac33 b221 ba1 bbc c1ab c33a cb23
12b3 1aa2 1c31 221c 23cc 2bbb 31a3 3332 3b21 a1 a2bc aaab ac3a b222 ba11 bb1 c1ac c33b cb24
12ba 1aa3 1c32 22 2a 2bbc 31aa 3333 3b22 a11 a2c aaac ac3b b223 ba12 bb2 c1b c33c cb25

filipe@san200534531:~/lab2$ ls [a-zA-Z0-9]?
all a13 a1b a21 a23 a2b a31 a33 a3b aa1 aa3 aab ab1 ab3 abb ac1 ac3 acb
a12 a1a a1c a22 a2a a2c a32 a3a a3c aa2 aaa aac ab2 aba abc ac2 aca acc
aa ab ac ba bb bc ca cb cc

filipe@san200534531:~/lab2$ ls [0-9][0-9][0-9]
111 113 122 131 133 212 221 223 232 311 313 322 331 333

filipe@san200534531:~/lab2$ echo "\Hi, How are you?"
\Hi, How are you?

filipe@san200534531:~/lab2$ echo "Hi, How are you?", he said.
Hi, How are you?, he said.
```

Screenshot 2

Command history

```
122b 1a1a 1bca 21b2 23a1 2b3 311b 32cb 3aba 3ca3 a231 aa2 ac b1bb b3aa bb33 c121 c31 cac ccac
122c 1a1b 1bcb 21b3 23a2 2b31 311c 32cc 3abb 3caa a232 aa21 ac1 b1bc b3ab bb3a c122 c311 cac1 ccb
123 1a1c 1bcc 21ba 23a3 2b32 312 33 3abc 3cab a233 aa22 ac11 b1c b3ac bb3b c123 c312 cac2 ccb1
1231 1a2 1c 21bb 23aa 2b33 3121 331 3ac 3cac a23a aa23 ac12 b1c1 b3b bb3c c12a c313 cac3 ccb2
1232 1a21 1c1 21bc 23ab 2b3a 3122 3311 3ac1 3cb a23b aa2a ac13 b1c2 b3b1 bba c12b c31a caca ccb3
1233 1a22 1c11 21c 23ac 2b3b 3123 3312 3ac2 3cb1 a23c aa2b ac1a b1c3 b3b2 bba1 c12c c31b cacb ccb4
123a 1a23 1c12 21c1 23b 2b3c 312a 3313 3ac3 3cb2 a2a a2c ac1b b1ca b3b3 bba2 c13 c31c cacc ccb5
123b 1a2a 1c13 21c2 23b1 2ba 312b 331a 3aca 3cb3 a2a1 aa3 ac1c b1cb b3ba bba3 c131 c32 cb ccb6
123c 1a2b 1c1a 21c3 23b2 2ba1 312c 331b 3acb 3cba a2a2 aa31 ac2 b1cc b3bb bbaa c132 c321 cb1 ccc
12a 1a2c 1c1b 21ca 23b3 2ba2 313 331c 3acc 3cbb a2a3 aa32 ac21 b2 b3bc bba3 c133 c322 cb11 ccc1
12a1 1a3 1c1c 21cb 23ba 2ba3 3131 332 3b 3cbc a2aa aa33 ac22 b21 b3c bbac c13a c323 cb12 ccc2
12a2 1a31 1c2 21cc 23bb 2baa 3132 3321 3b1 3cc a2ab aa3a ac23 b211 b3c1 bbb c13b c32a cb13 ccc3
12a3 1a32 1c21 22 23bc 2bab 3133 3322 3b11 3cc1 a2ac aa3b ac2a b212 b3c2 bbb1 c13c c32b cb1a ccca
12aa 1a33 1c22 221 23c 2bac 313a 3323 3b12 3cc2 a2b aa3c ac2b b213 b3c3 bbb2 c1a c32c cb1b cccb
12ab 1a3a 1c23 2211 23c1 2bb 313b 332a 3b13 3cc3 a2b1 aaa ac2c b21a b3ca bbb3 c1a1 c33 cb1c cccc
12ac 1a3b 1c2a 2212 23c2 2bb1 313c 332b 3b1a 3cca a2b2 aa1 ac3 b21b b3cb bba c1a2 c331 cb2
12b 1a3c 1c2b 2213 23c3 2bb2 31a 332c 3b1b 3ccb a2b3 aa2 ac31 b1cc bbb3 c1a3 c332 cb21
12b1 1aa 1c2c 221a 23ca 2bb3 31a1 333 3b1c 3ccc a2ba aa3 ac32 b22 ba bbb4 c1aa c333 cb22
12b2 1aa1 1c3 221b 23cb 2bba 31a2 3331 3b2 a a2bb aaaa ac33 b221 ba1 bbc c1ab c33a cb23
12b3 1aa2 1c31 221c 23cc 2bbb 31a3 3332 3b21 a1 a2bc aaab ac3a b222 ba11 bb1 c1ac c33b cb24
12ba 1aa3 1c32 22 2a 2bbc 31aa 3333 3b22 a11 a2c aaac ac3b b223 ba12 bb2 c1b c33c cb25

filipe@san200534531:~/lab2$ ls [a-zA-Z0-9]?
all a13 a1b a21 a23 a2b a31 a33 a3b aa1 aa3 aab ab1 ab3 abb ac1 ac3 acb
a12 a1a a1c a22 a2a a2c a32 a3a a3c aa2 aaa aac ab2 aba abc ac2 aca acc
aa ab ac ba bb bc ca cb cc

filipe@san200534531:~/lab2$ ls [0-9][0-9][0-9]
111 113 122 131 133 212 221 223 232 311 313 322 331 333

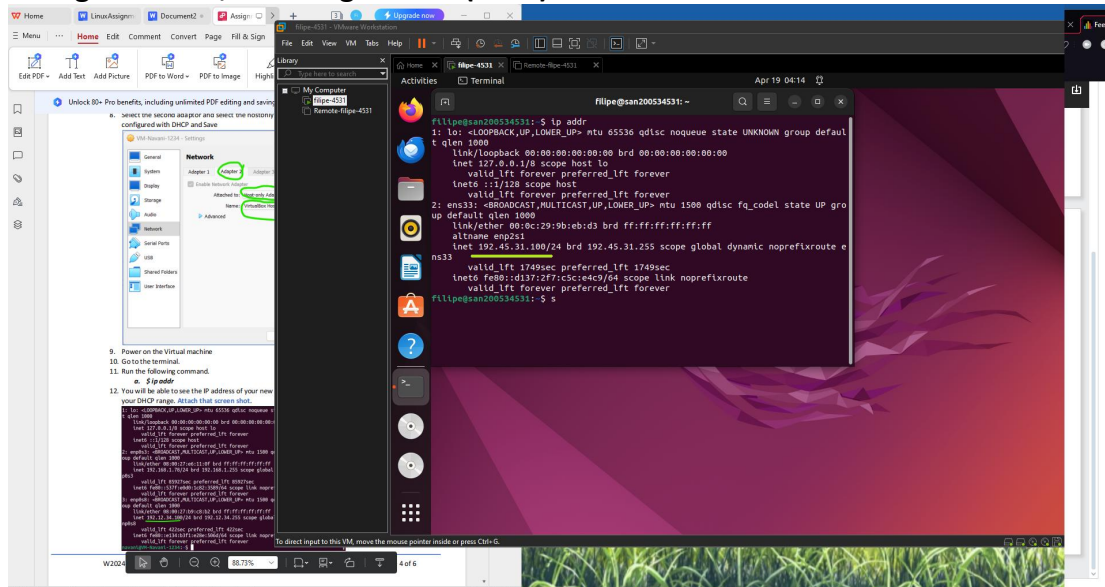
filipe@san200534531:~/lab2$ echo "\Hi, How are you?"
\Hi, How are you?

filipe@san200534531:~/lab2$ echo "Hi, How are you?", he said.
Hi, How are you?, he said.
```

Screenshot 3

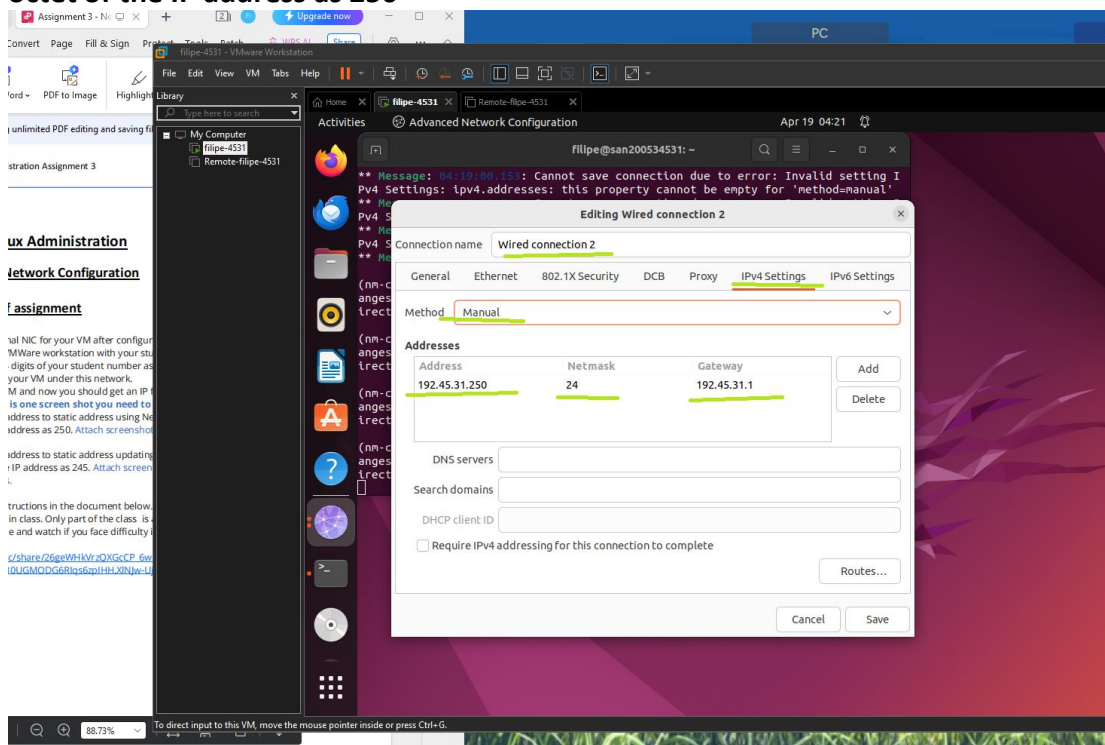
Assignment3 - Configuring NIC

Change IP DHCP, last 4 digits of ID (4531)



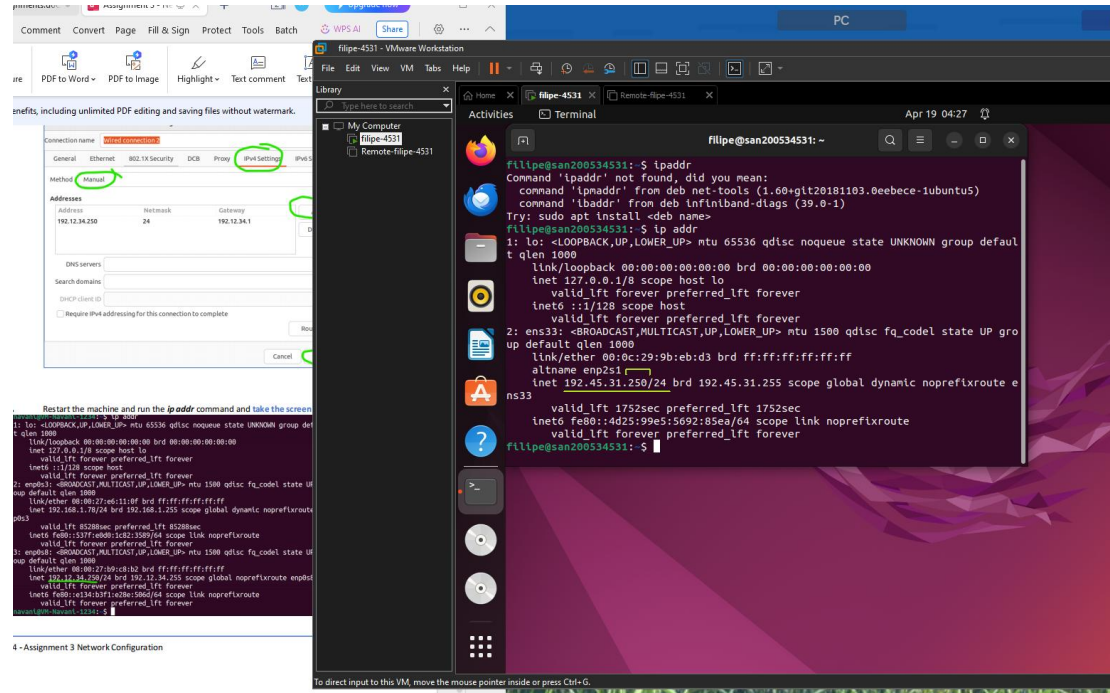
Screenshot1

Change the IP address to static address using Network Manager tool nmcli with the last octet of the IP address as 250



Screenshot 2

Change the IP address to static address updating the yaml file in using netplan with the last octet of the IP address as 250

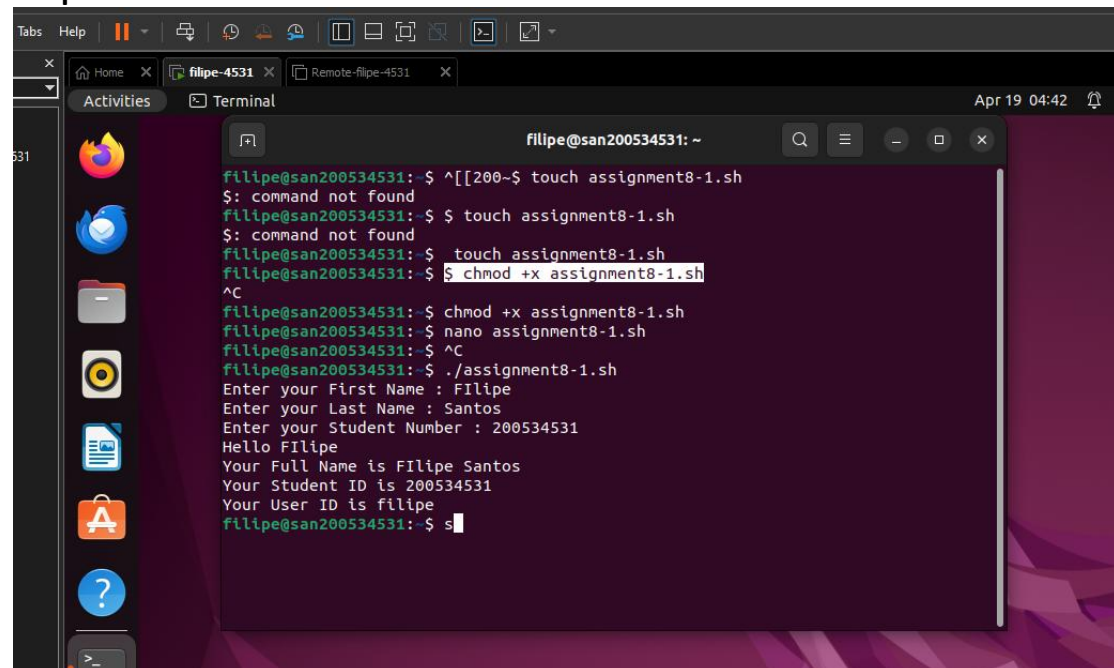


Screenshot 3

Assignment8 - Linux Scripting and Changing Desktop Environment

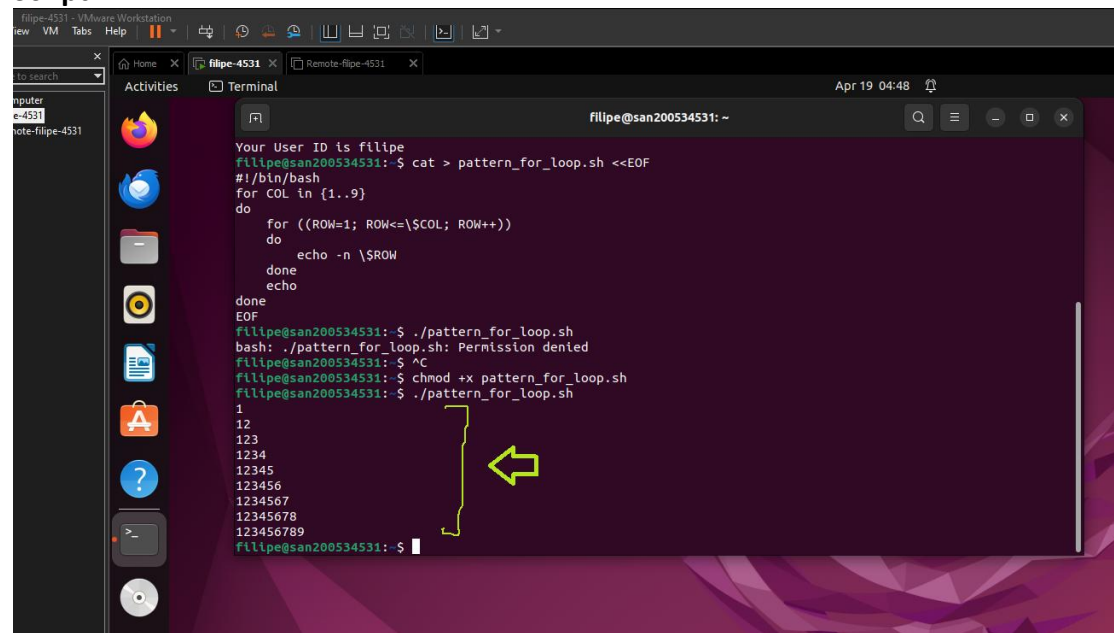
Part 1- Write Script in Linux

Script 1



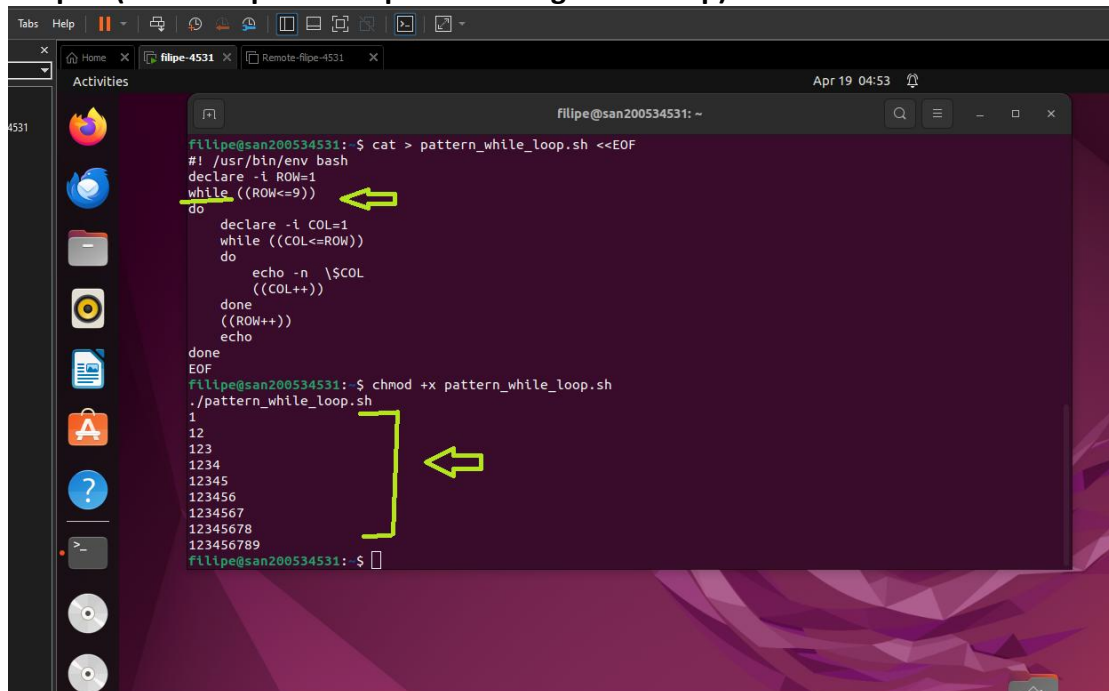
```
filipe@san200534531: ~  
filipe@san200534531:~$ ^[[200-$ touch assignment8-1.sh  
$: command not found  
filipe@san200534531:~$ touch assignment8-1.sh  
$: command not found  
filipe@san200534531:~$ touch assignment8-1.sh  
filipe@san200534531:~$ chmod +x assignment8-1.sh  
^C  
filipe@san200534531:~$ chmod +x assignment8-1.sh  
filipe@san200534531:~$ nano assignment8-1.sh  
filipe@san200534531:~$ ^C  
filipe@san200534531:~$ ./assignment8-1.sh  
Enter your First Name : Filipe  
Enter your Last Name : Santos  
Enter your Student Number : 200534531  
Hello Filipe  
Your Full Name is Filipe Santos  
Your Student ID is 200534531  
Your User ID is filipe  
filipe@san200534531:~$ s
```

Script 2



```
filipe@san200534531: ~  
Your User ID is filipe  
filipe@san200534531:~$ cat > pattern_for_loop.sh <<EOF  
#!/bin/bash  
for COL in {1..9}  
do  
    for ((ROW=1; ROW<=SCOL; ROW++))  
    do  
        echo -n \" $ROW  
    done  
    echo  
done  
EOF  
filipe@san200534531:~$ ./pattern_for_loop.sh  
bash: ./pattern_for_loop.sh: Permission denied  
filipe@san200534531:~$ ^C  
filipe@san200534531:~$ chmod +x pattern_for_loop.sh  
filipe@san200534531:~$ ./pattern_for_loop.sh  
1  
12  
123  
1234  
12345  
123456  
1234567  
12345678  
123456789  
filipe@san200534531:~$
```

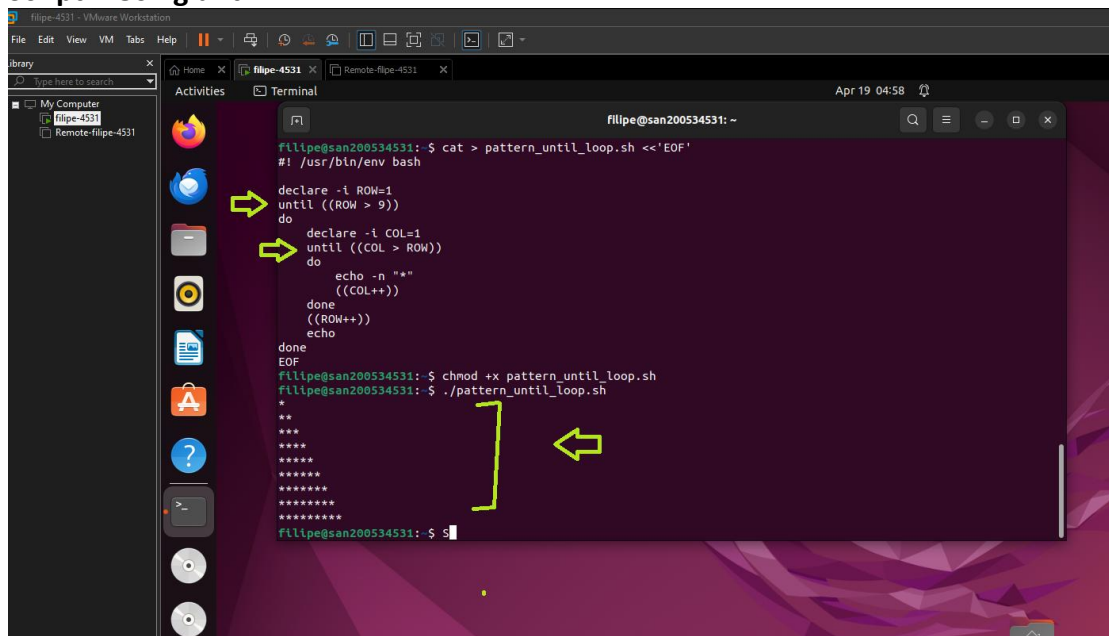

Script 3 (Same output as script 2 but using While loop)



```
filipe@san200534531:~$ cat > pattern_while_loop.sh <<EOF
#!/usr/bin/env bash
declare -i ROW=1
while ((ROW<=9))
do
    declare -i COL=1
    while ((COL<=ROW))
    do
        echo -n \"$COL\"
        ((COL++))
    done
    ((ROW++))
    echo
done
EOF
filipe@san200534531:~$ chmod +x pattern_while_loop.sh
./pattern_while_loop.sh
1
12
123
1234
12345
123456
1234567
12345678
123456789
filipe@san200534531:~$
```

The screenshot shows a terminal window with a dark purple background. The terminal displays the creation and execution of a shell script named `pattern_while_loop.sh`. The script uses nested `while` loops to print a pattern of numbers from 1 to 9, where each row contains a sequence of numbers from 1 to the row number. The output is a right-angled triangle of numbers. Yellow arrows point to the `while ((ROW<=9))` line and the closing bracket of the inner loop, and a yellow bracket highlights the entire output pattern.

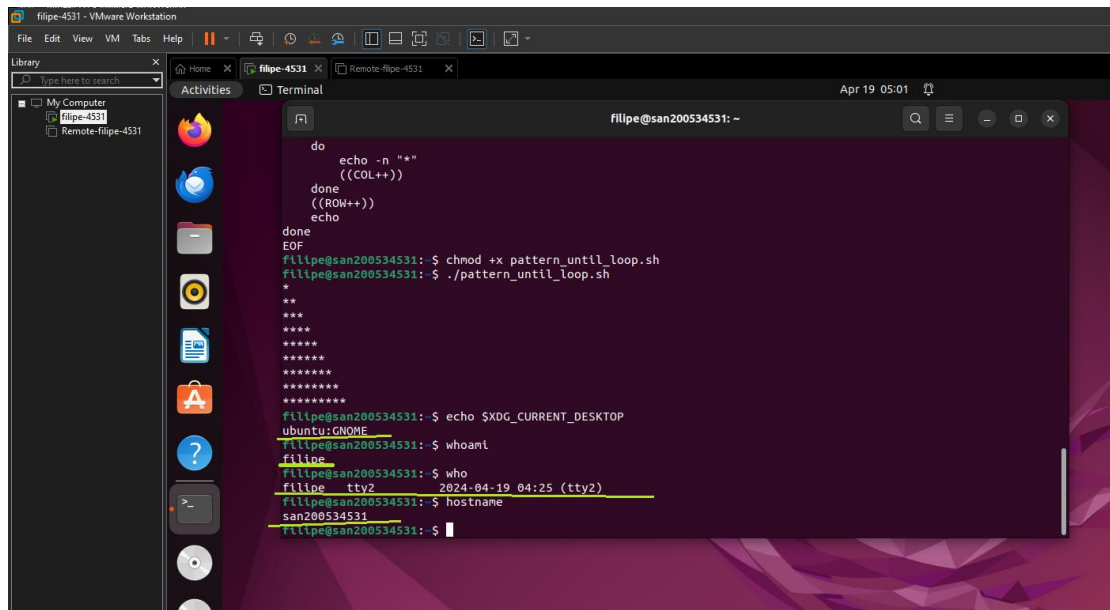
Script 4 Using until



```
filipe@san200534531:~$ cat > pattern_until_loop.sh <<'EOF'
#!/usr/bin/env bash
declare -i ROW=1
until ((ROW > 9))
do
    declare -i COL=1
    until ((COL > ROW))
    do
        echo -n "*"
        ((COL++))
    done
    ((ROW++))
    echo
done
EOF
filipe@san200534531:~$ chmod +x pattern_until_loop.sh
./pattern_until_loop.sh
*
**
***
****
*****
*****
*****
*****
*****
filipe@san200534531:~$
```

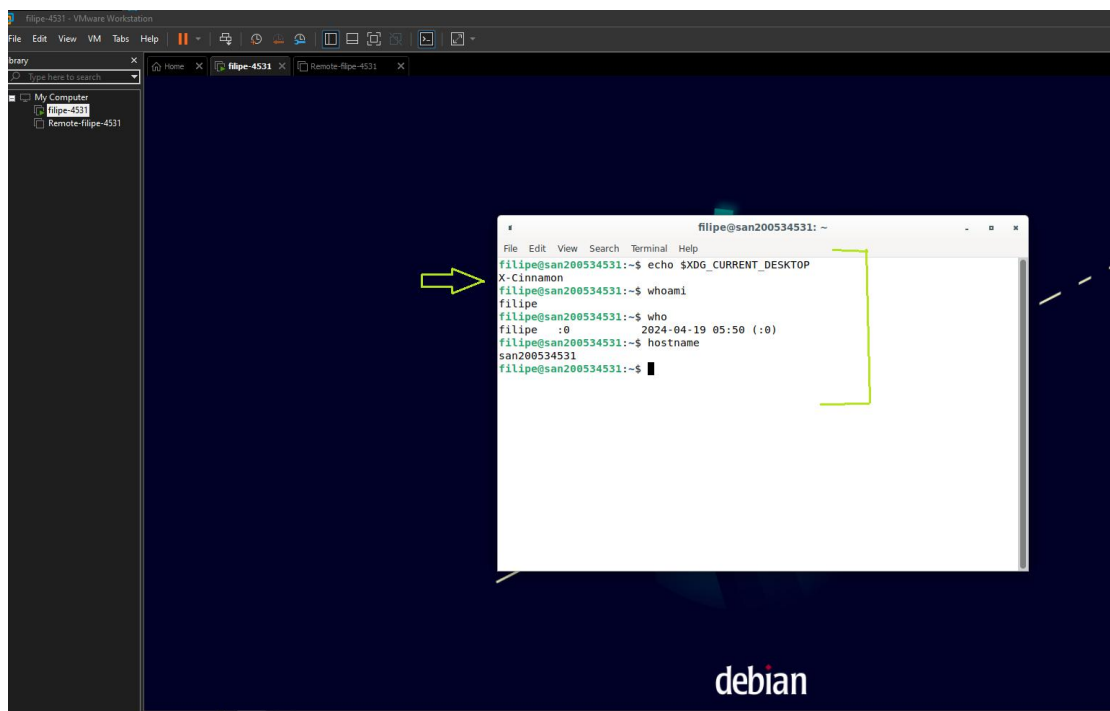
The screenshot shows a terminal window with a dark purple background. The terminal displays the creation and execution of a shell script named `pattern_until_loop.sh`. The script uses nested `until` loops to print a pattern of asterisks. The output is a right-angled triangle of asterisks. Yellow arrows point to the `until ((ROW > 9))` line and the closing bracket of the inner loop, and a yellow bracket highlights the entire output pattern.

Part 2 - Install a different desktop environment



Screenshot 1

Cinnamon Desktop Environment Installed



Screenshot 2