



RAJSHAHI UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Computer Science & Engineering

LAB REPORT

Topic: Introduction to Linux and Its Basic Commands.

Course No: CSE 3202

Course Name: Sessional Based on Operating Systems

Submitted By

Saifur Rahman
Roll No: 1703018
Section: A
CSE, RUET

Submitted To

Mohiuddin Ahmed
Lecturer
CSE, RUET

Date of Lab: 7th Mar 2022

Date of Submission: 21st Mar 2022

INDEX

Topic No: 1	1
Topic Name: Introduction to Linux and Its Basic Commands.	1
Objectives	1
Theory	1
<i>Linux</i>	1
<i>Advantages of Linux</i>	1
<i>Distributors of Linux</i>	1
<i>Shell</i>	1
<i>Types of Shell</i>	1
Commands	2
<i>cd 'directory_name'</i>	2
<i>cd /mnt/'directory_name'</i>	2
<i>pwd</i>	2
<i>ls -al</i>	3
<i>touch 'file_name.txt'</i>	3
<i>nano 'file_name.txt'</i>	4
<i>cat 'file_name.txt'</i>	4
<i>rm 'file_name.txt'</i>	5
<i>mkdir 'folder_name'</i>	5
<i>cd ..</i>	6
<i>chmod u = rwx 'folder_name'</i>	6
Shell Coding	7
<i>Header</i>	7
<i>File Extension</i>	7
<i>Command to run code</i>	7
<i>echo 'string'</i>	7
CODE:	7
Discussion	8

Topic No: 1

Topic Name: Introduction to Linux and Its Basic Commands.

Objectives

- To learn about Linux operating system.
- To learn about windows subsystem for Linux.
- To learn basic Linux commands.
- To learn shell coding.

Theory

Linux

Linux is an open-source operating system modelled on Unix. It began as a personal project by Finnish student Linus Torvalds. In 1991, while studying computer science at University of Helsinki, Linus Torvalds began a project that later became the Linux kernel. He wrote the program specifically for the hardware he was using and independent of an operating system because he wanted to use the functions of his new PC with an 80386 processor.

Development was done on MINIX using the GNU C Compiler.

Advantages of Linux

- Open source
- High security and stability
- Ease of maintenance
- Runs on any hardware
- Free
- Ease of use
- Flexibility in customization

Distributors of Linux

- Debian
- Gentoo
- Ubuntu
- Linux Mint
- Red Hat Enterprise Linux
- CentOS
- Fedora
- Kali Linux

Shell

Shell is an interface between the user and the kernel. It provides a platform to interact with the kernel. Here we can run our commands, programs, and shell scripts.

Types of Shell

- Bourne Shell (sh)
- Bourne Again Shell (bash)
- C Shell (csh)
- Z Shell (zsh)
- Korn Shell (ksh)
- POSIX shell (sh)

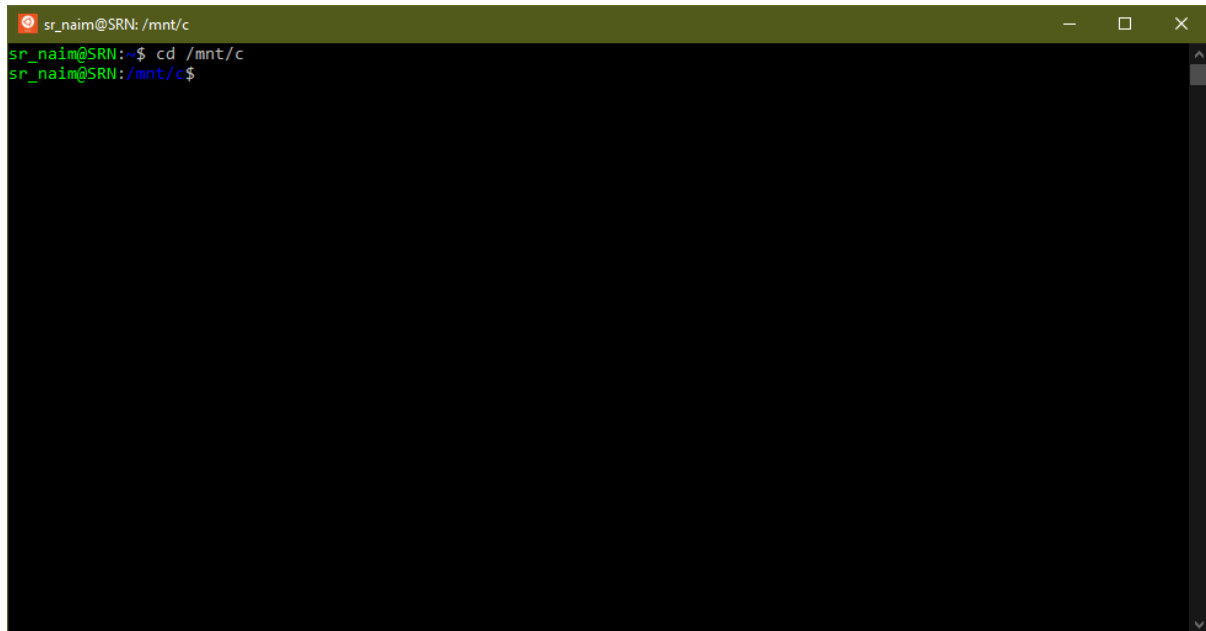
Commands

`cd 'directory_name'`

changes directory to 'directory_name'

`cd /mnt/'directory_name'`

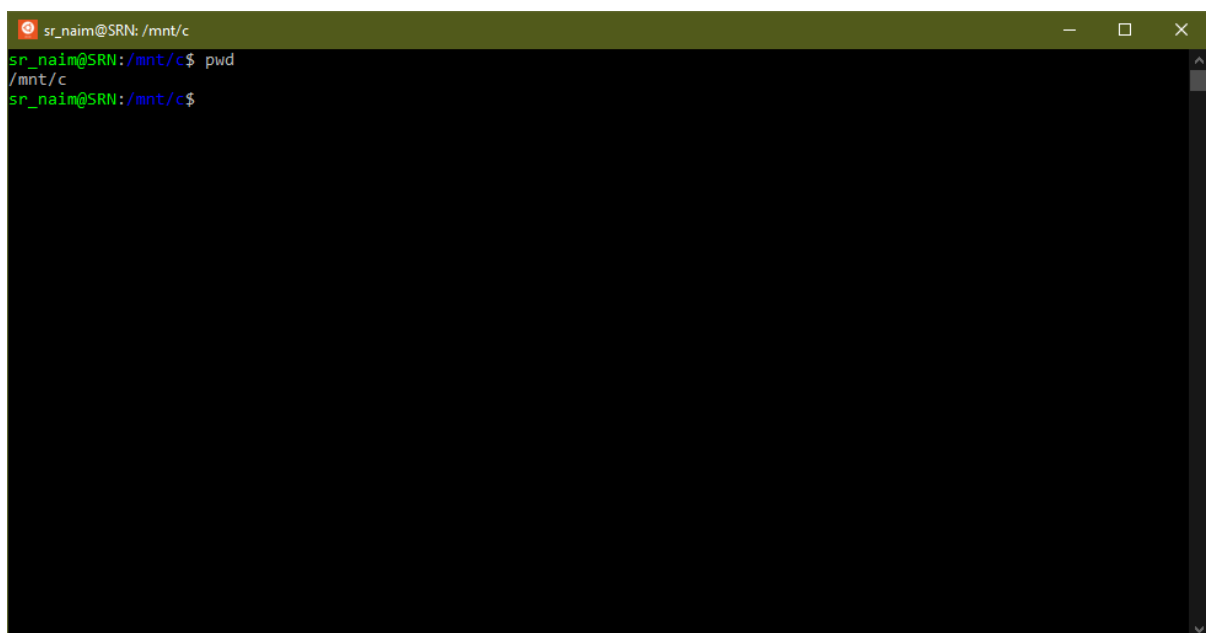
changes directory to 'directory_name' [on windows subsystem for Linux]

A terminal window with a dark background and a green title bar. The title bar text is 'sr_naim@SRN: /mnt/c'. The terminal shows the command 'cd /mnt/c' being entered and executed. The prompt changes from 'sr_naim@SRN:~\$' to 'sr_naim@SRN:/mnt/c\$'.

```
sr_naim@SRN: /mnt/c
sr_naim@SRN:~$ cd /mnt/c
sr_naim@SRN:/mnt/c$
```

`pwd`

Shows present working directory

A terminal window with a dark background and a green title bar. The title bar text is 'sr_naim@SRN: /mnt/c'. The terminal shows the command 'pwd' being entered and executed. The output is '/mnt/c'. The prompt changes from 'sr_naim@SRN:/mnt/c\$' to 'sr_naim@SRN:/mnt/c\$'.

```
sr_naim@SRN: /mnt/c
sr_naim@SRN:/mnt/c$ pwd
/mnt/c
sr_naim@SRN:/mnt/c$
```

ls -al

List of all files and directories

```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202$ ls -al
total 0
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 13 16:48 .
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 13 16:48 ..
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 13 16:48 Lab 1
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202$
```

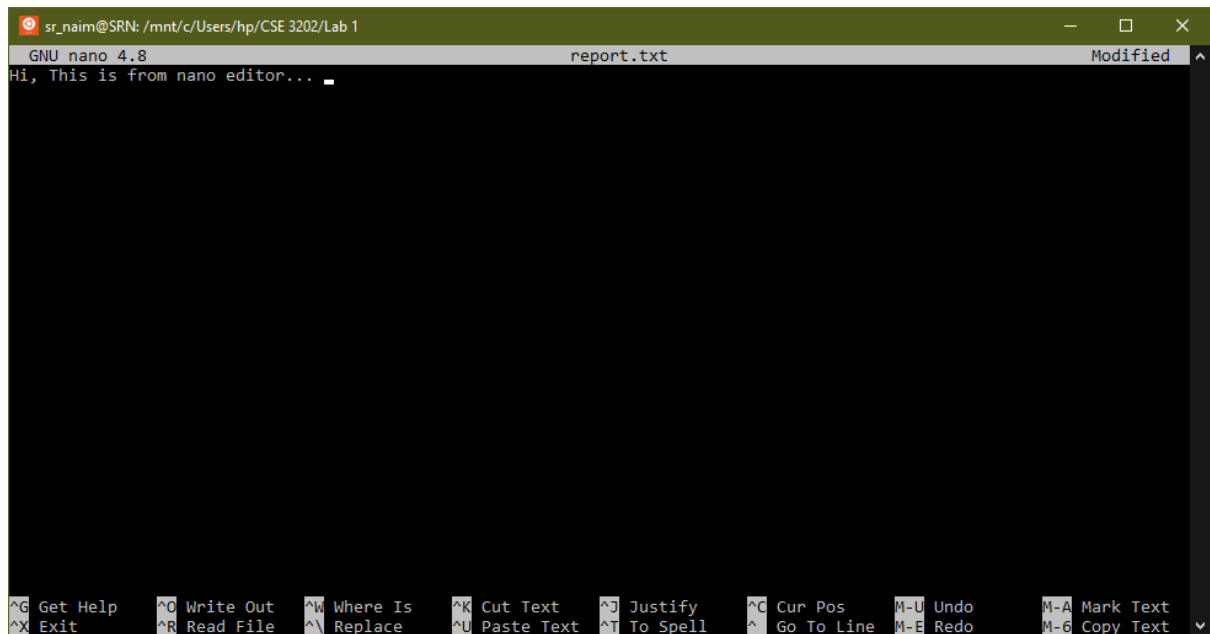
touch 'file_name.txt'

creates a file named 'file_name.txt' in that directory

```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ touch report.txt
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ ls -al
total 0
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 18 05:11 .
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 13 16:48 ..
-rwxrwxrwx 1 sr_naim sr_naim 52 Mar 7 11:25 'Introduction to linux and its basic commands.txt'
-rwxrwxrwx 1 sr_naim sr_naim 50 Mar 7 12:48 hello.sh
-rwxrwxrwx 1 sr_naim sr_naim 0 Mar 18 05:11 report.txt
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$
```

nano 'file_name.txt'

Opens GNU nano editor for editing 'file_name.txt'

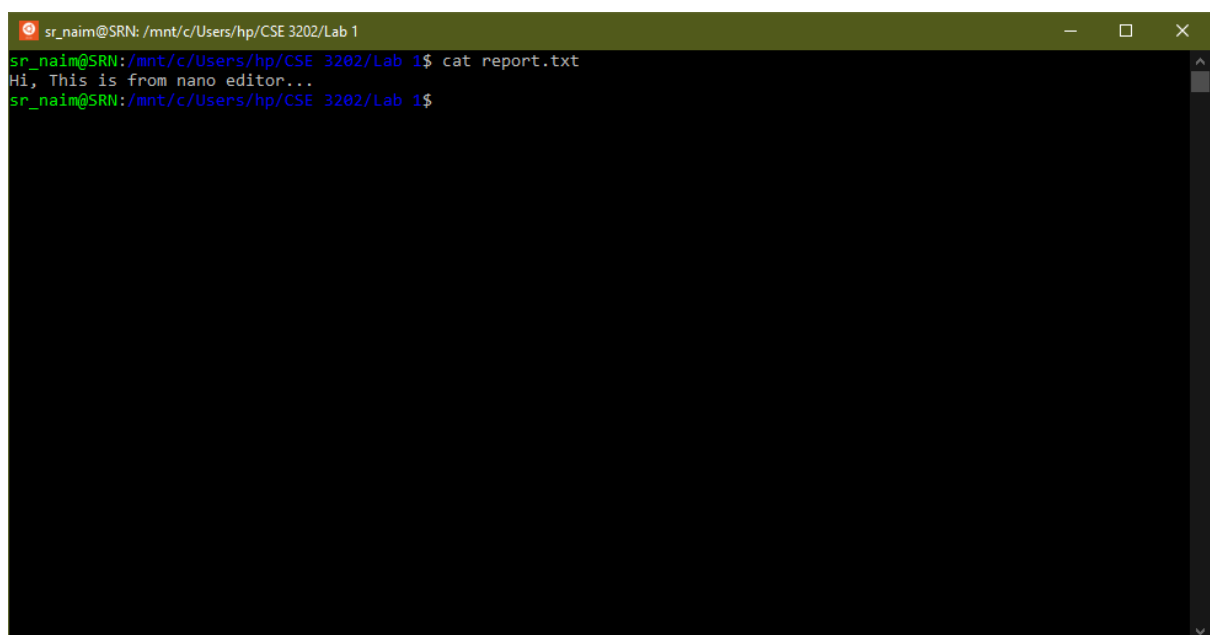


```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1
GNU nano 4.8 report.txt Modified
Hi, This is from nano editor...

^G Get Help  ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos    M-U Undo      M-A Mark Text
^X Exit      ^R Read File  ^\ Replace   ^U Paste Text ^T To Spell   ^_ Go To Line  M-E Redo      M-6 Copy Text
```

cat 'file_name.txt'

shows the text on kernel



```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ cat report.txt
Hi, This is from nano editor...
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$
```

`rm 'file_name.txt'`
deletes file from directory

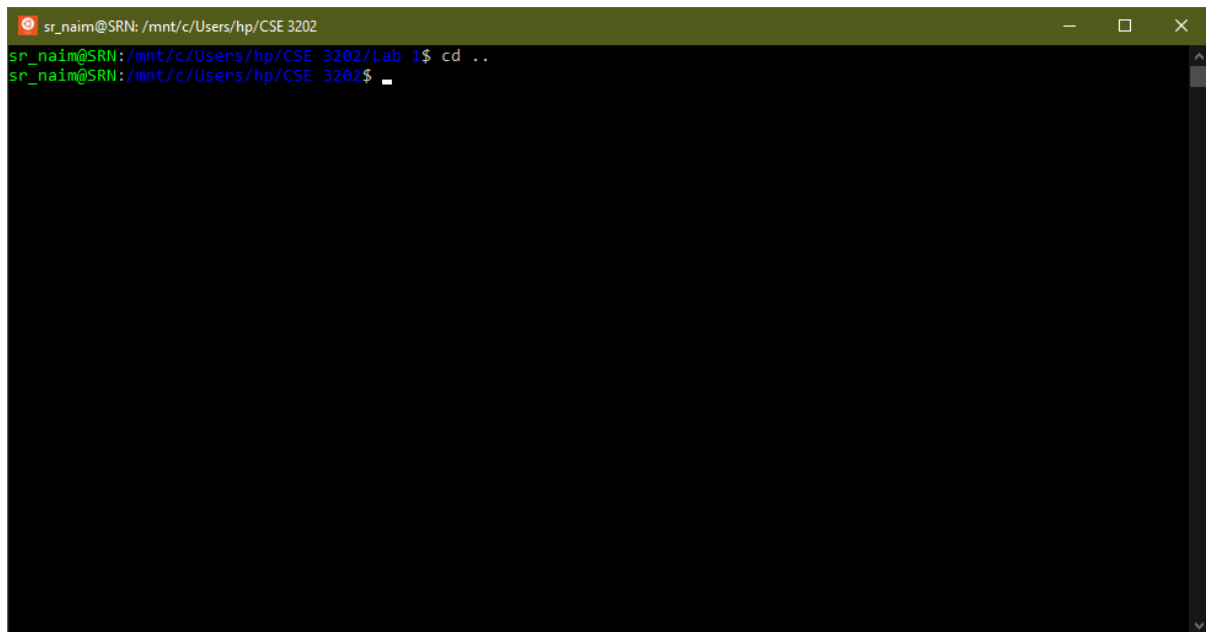
```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$ rm report.txt
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$ ls -al
total 0
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 18 05:21
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 13 16:48
-rwxrwxrwx 1 sr_naim sr_naim 52 Mar 7 11:25 'Introduction to linux and its basic commands.txt'
-rwxrwxrwx 1 sr_naim sr_naim 50 Mar 7 12:48 hello.sh
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$
```

`mkdir 'folder_name'`
creates a folder

```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$ mkdir 'Test folder'
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$ ls -al
total 0
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 18 05:23
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 13 16:48
-rwxrwxrwx 1 sr_naim sr_naim 52 Mar 7 11:25 'Introduction to linux and its basic commands.txt'
drwxrwxrwx 1 sr_naim sr_naim 4096 Mar 18 05:23 Test folder
-rwxrwxrwx 1 sr_naim sr_naim 50 Mar 7 12:48 hello.sh
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$
```

cd ..

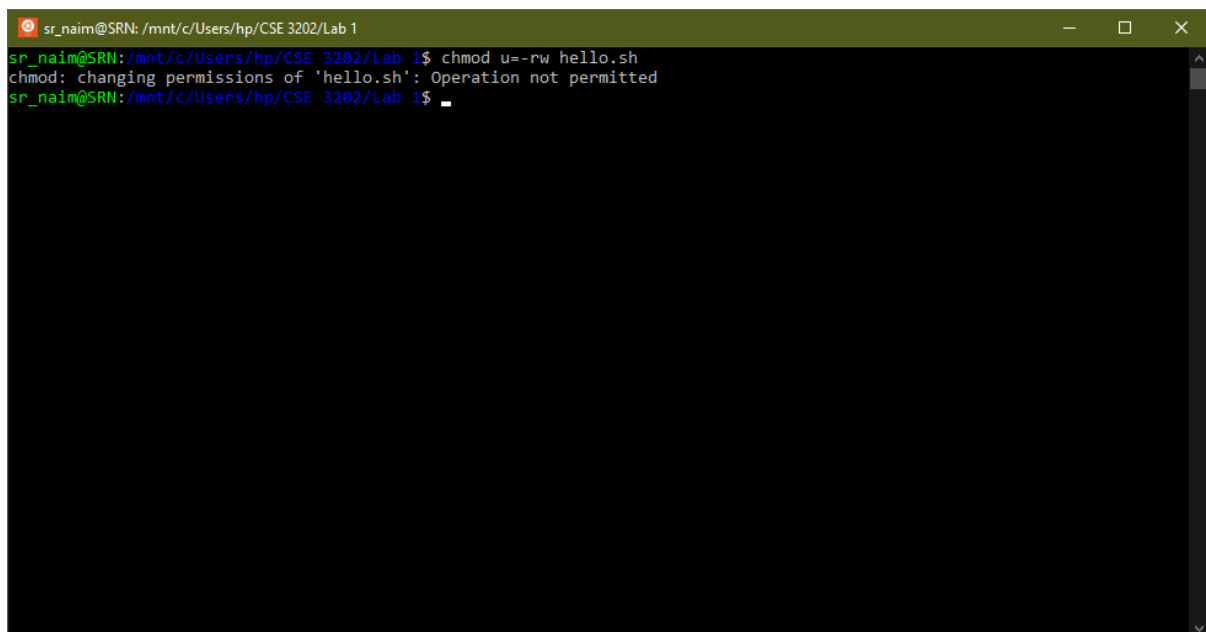
Returns to parent folder



```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$ cd ..
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202$
```

chmod u = rwx 'folder_name'

Changes permissions of file or directories



```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$ chmod u=-rw hello.sh
chmod: changing permissions of 'hello.sh': Operation not permitted
sr_naim@SRN:/mnt/c/Users/hp/CSE 3202/Lab 1$
```


Shell Coding

Header

```
#!/bin/bash
```

File Extension

```
.sh
```

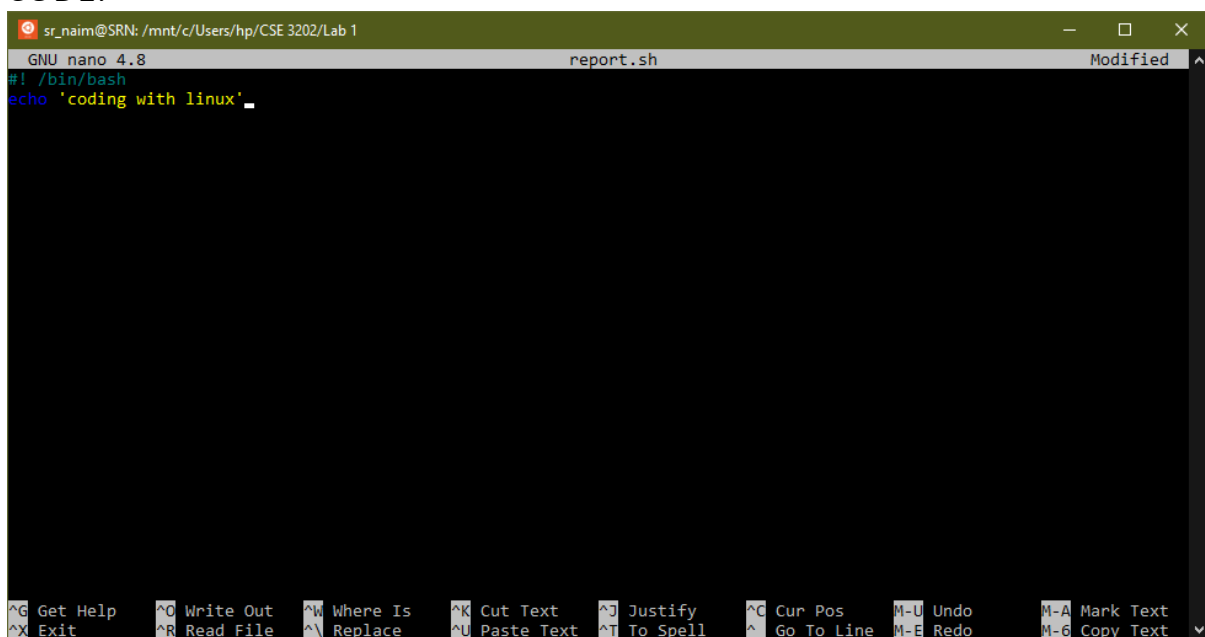
Command to run code

```
./'file_name'
```

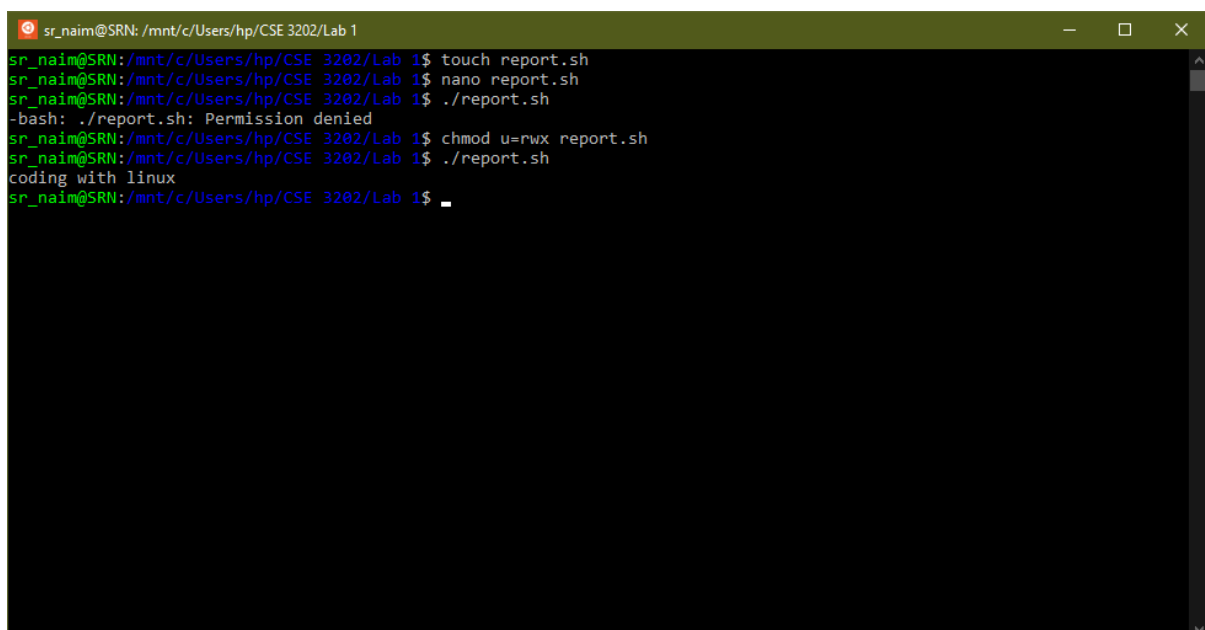
echo 'string'

prints 'string'

CODE:



```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1
GNU nano 4.8 report.sh Modified
#!/bin/bash
echo 'coding with linux' _
```



```
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ touch report.sh
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ nano report.sh
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ ./report.sh
-bash: ./report.sh: Permission denied
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ chmod u=rwx report.sh
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ ./report.sh
coding with linux
sr_naim@SRN: /mnt/c/Users/hp/CSE 3202/Lab 1$ _
```

Discussion

While running a .sh file it shows 'Permission denied'. Because the user does not have the permission to execute the file. So, we needed to use 'chmod' command to make that file executable.

The 'chmod' command shows an error 'Operation not permitted' because user is not the owner of /root folder. So, the change of permission can only be done by the root user.

Generally, the 'chmod' command does not work in WSL. Because 'chmod' does not change file permissions of files stored on NTFS or fat32 file systems. So, files are needed to be copied on WSL file system. This is done by two commands:

```
sudo umount /mnt/c
```

```
sudo mount -t drvfs C: /mnt/c -o metadata
```