# Introduction to Programming
# Lab 1

January 2, 2017

## Part 1: Introduction to Linux

1. Turn on your system and login using your kerberos login ID and password.

2. Press Ctrl + Alt + T to open a terminal.

3. Create a directory in your home folder (using mkdir) and name it as COL100. Type `mkdir COL100`

4. Change the current directory to COL100. Type `cd COL100`.

5. In this directory, create another folder, called as Lab1. Type `mkdir Lab1`

6. cd to Lab1. Type `cd Lab1.`

7. Create a text file "a.txt" using gedit (type `gedit a.txt`) and write your name and entry number in it. Save it and close it.

8. Copy the contents of "a.txt" to "b.txt" using cp. Type `cp a.txt b.txt`

9. Open "b.txt" and verify that it is a copy of "a.txt". Type `gedit b.txt`.

10. List the contents of the directory Lab1 and learn how to recognize files and folders. Type `ls`.

11. Rename "b.txt" as "acopy.txt" using mv. Type `mv b.txt acopy.txt`.

12. Retrieve previous commands using the arrow keys.

13. Move out of COL100 using .. Type `cd ..`

14. Copy the directory hierarchy COL100 to COL100copy using cp -r. Type `cp -r COL100 COL100copy`.

15. List the folder contents using ls. Type `ls`

16. Delete the directory hierarchy COL100copy using rm and rm -r. Type `rm -r COL100copy`.

17. List the folder contents using ls. Also find out what ls -a does. Type `ls -a`.

18. Learn the meaning of .. and .

19. Use man to learn about different commands. Type `man ls`.

20. Open an internet browser and set the Automatic proxy configuration url to http://www.cc.iitd.ernet.in/cgi-bin/proxy.btech (or proxy.dual if you are a Dual Degree student).
    (For Firefox, open Options > Advanced > Network Tab > (Connection) Settings > Choose "Automatic proxy configuration" and set the URL)

21. Using cd and ls, check the contents of various other directories.

22. Change permissions for a file or folder using chmod.

23. Explore the Linux file system and see what else is there on it. Use Google search to learn about the directories root (/), /etc/, /bin/.

24. Explore the other processes running in the system and try killing some processes (using "ps" and "kill").

25. Open "acopy.txt", change the entry number slightly and observe the difference using diff.

26. Learn about I/O redirection (using ">" and "|").

27. Learn about text search and manipulation (using "grep", "sort", "uniq", etc.)

## Useful Commands in Linux

1. Open terminal: `Ctrl + Alt + T`

2. Terminate current Linux command: `Ctrl + C`

3. Make a new directory: `mkdir` *dirname*

4. Copy: `cp` *src dest*

5. Rename: `mv` *originalname newname*

6. Delete: `rm` *filename*

7. Change working directory: `cd` *path*

8. List contents of a folder: `ls`

9. List contents of a folder including hidden files: `ls -a`

10. Print current directory: `pwd`

11. Run a python code: `python ./name.py`

## Part 2: Programming with Python Examples

1. In a terminal, open a text file using gedit. Copy the program given below. Name it as `hello.py` and save it.

```
1 # Hello World program in Python
2 print('Hello, world!')
```

To run it, type `python ./hello.py` into the terminal. You can also enter the python console using the `python` command.

2. Now, let us write a program to add two numbers:

```
1
2 # Store input numbers
3 num1 = input('Enter first number: ')
4 num2 = input('Enter second number: ')
5
6 # Add two numbers
7 sum = float(num1) + float(num2)
8
9 # Display the sum
10 print "The sum of", num1, "and", num2, "is", sum
```