



Terminal Basics

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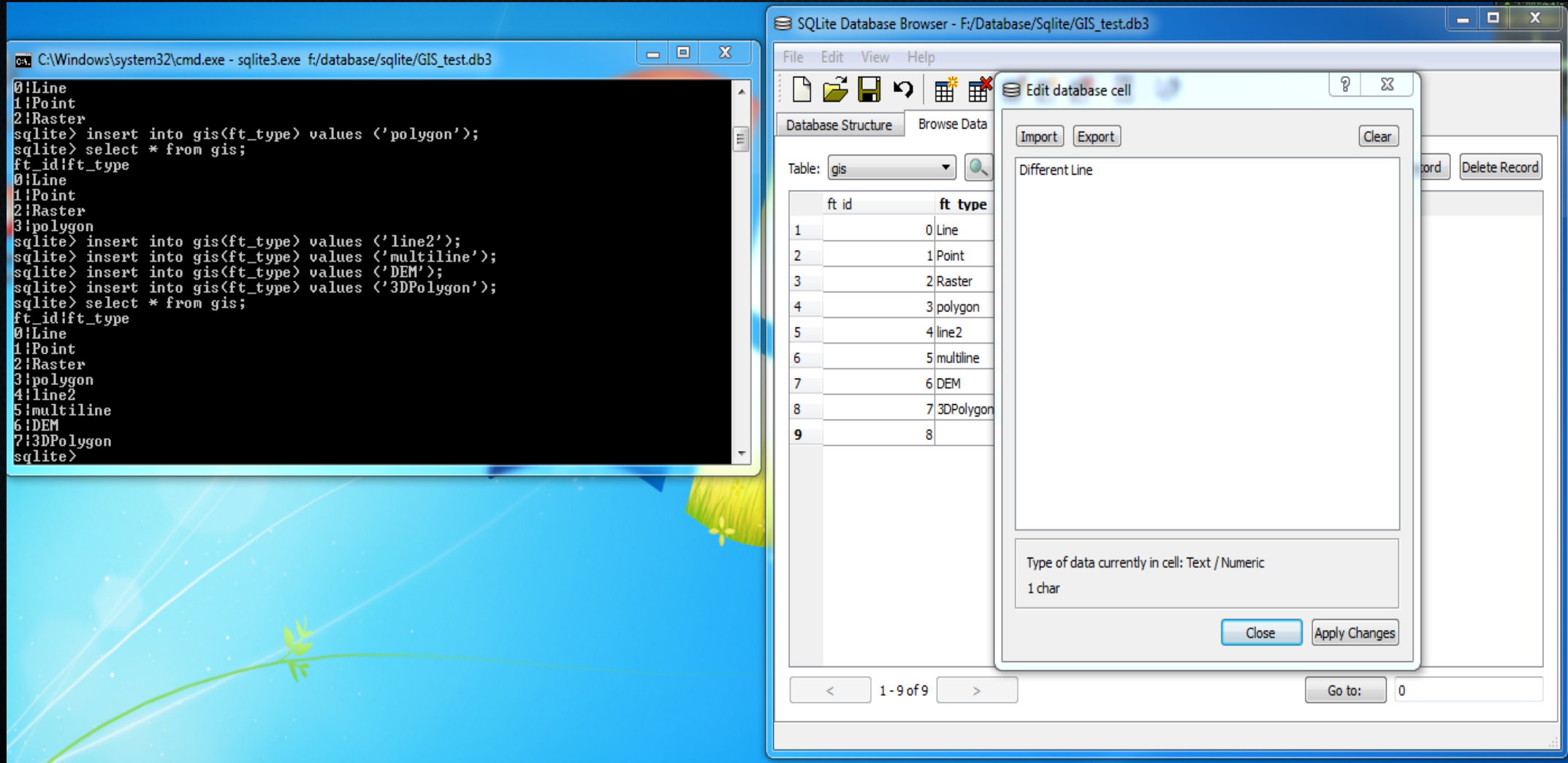
Introduction to Linux

Linux is a free Unix-type operating system Created by
Linus Torvalds

Developed under the GNU General Public License

The source code for Linux is freely available to everyone

Graphical Vs Commandline Interfaces



The image compares two interfaces for interacting with a SQLite database. On the left, a command-line interface (CLI) window shows SQL commands and their output. On the right, a graphical user interface (GUI) window shows the same data in a table format, with an 'Edit database cell' dialog box open for editing a specific cell.

Commandline Interface (CLI) Window:

```
C:\Windows\system32\cmd.exe - sqlite3.exe f:/database/sqlite/GIS_test.db3

0:Line
1:Point
2:Raster
sqlite> insert into gis(ft_type) values ('polygon');
sqlite> select * from gis;
ft_id|ft_type
0:Line
1:Point
2:Raster
3:polygon
sqlite> insert into gis(ft_type) values ('line2');
sqlite> insert into gis(ft_type) values ('multiline');
sqlite> insert into gis(ft_type) values ('DEM');
sqlite> insert into gis(ft_type) values ('3DPolygon');
sqlite> select * from gis;
ft_id|ft_type
0:Line
1:Point
2:Raster
3:polygon
4:line2
5:multiline
6:DEM
7:3DPolygon
sqlite>
```

Graphical Interface (GUI) Window:

SQLite Database Browser - F:/Database/Sqlite/GIS_test.db3

Database Structure | Browse Data

Table: gis

ft id	ft type
1	0 Line
2	1 Point
3	2 Raster
4	3 polygon
5	4 line2
6	5 multiline
7	6 DEM
8	7 3DPolygon
9	8

Edit database cell dialog box:

Import | Export | Clear

Different Line

Type of data currently in cell: Text / Numeric
1 char

Close | Apply Changes

1 - 9 of 9 | Go to: 0

Command Line Interfaces



- These days terminal is a piece of software but it originally meant a physical piece of hardware for interfacing with the computer

Command line Interface is

- Programmable
- Efficient in terms of Bandwidth
- You can work remotely

Examples of command line interface

```
Command Prompt
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1993 Microsoft Corp.
C:\users\default>
```

File Find Disable View Images Cach

HTML CSS Console Script Prof



```
>> console.log("Hello world")
LOG: Hello world
```

Python Shell

File Edit Shell Debug Options Windows Help

Python 2.5.4 (r254:67916, Dec 23 2008, 15:10:54) [MSC v.1310 32 bit (Intel)]
on win32

Type "copyright", "credits" or "license()" for more information.

```
*****
Personal firewall software may warn about the connection IDLE
makes to its subprocess using this computer's internal loopback
interface. This connection is not visible on any external
interface and no data is sent to or received from the Internet.
*****
```

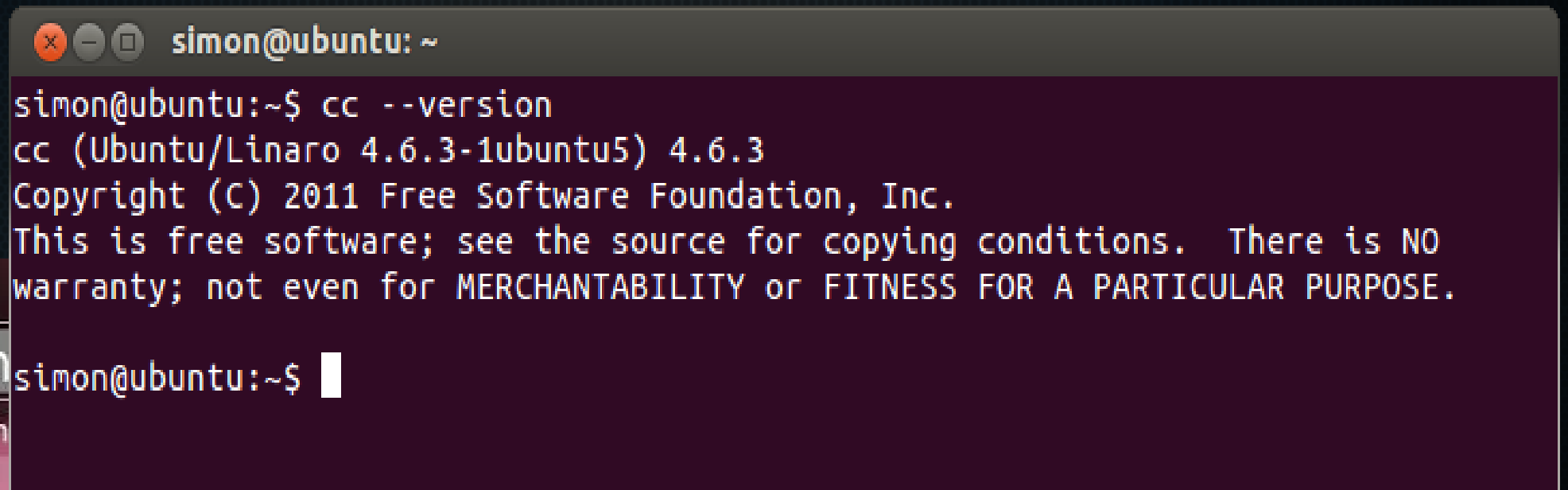
IDLE 1.2.4

```
>>>
```

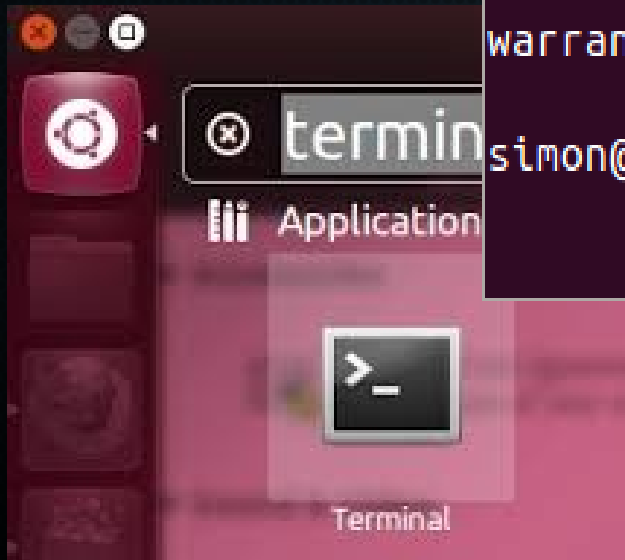
Ln: 12 Col: 4

Linux Terminal

- Press Control+Alt+T to launch terminal



```
simon@ubuntu: ~  
simon@ubuntu:~$ cc --version  
cc (Ubuntu/Linaro 4.6.3-1ubuntu5) 4.6.3  
Copyright (C) 2011 Free Software Foundation, Inc.  
This is free software; see the source for copying conditions. There is NO  
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  
simon@ubuntu:~$
```



Terminal Vs Shell

- Bourne shell
- C shell
- Korn shell
- Bash shell etc..

Unix and Linux programmers over the years have written many different shell programs

Lets get our hands dirty



```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ date
```

```
Wed Nov 25 17:02:04 IST 2015
```

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ expr 10 + 21
```

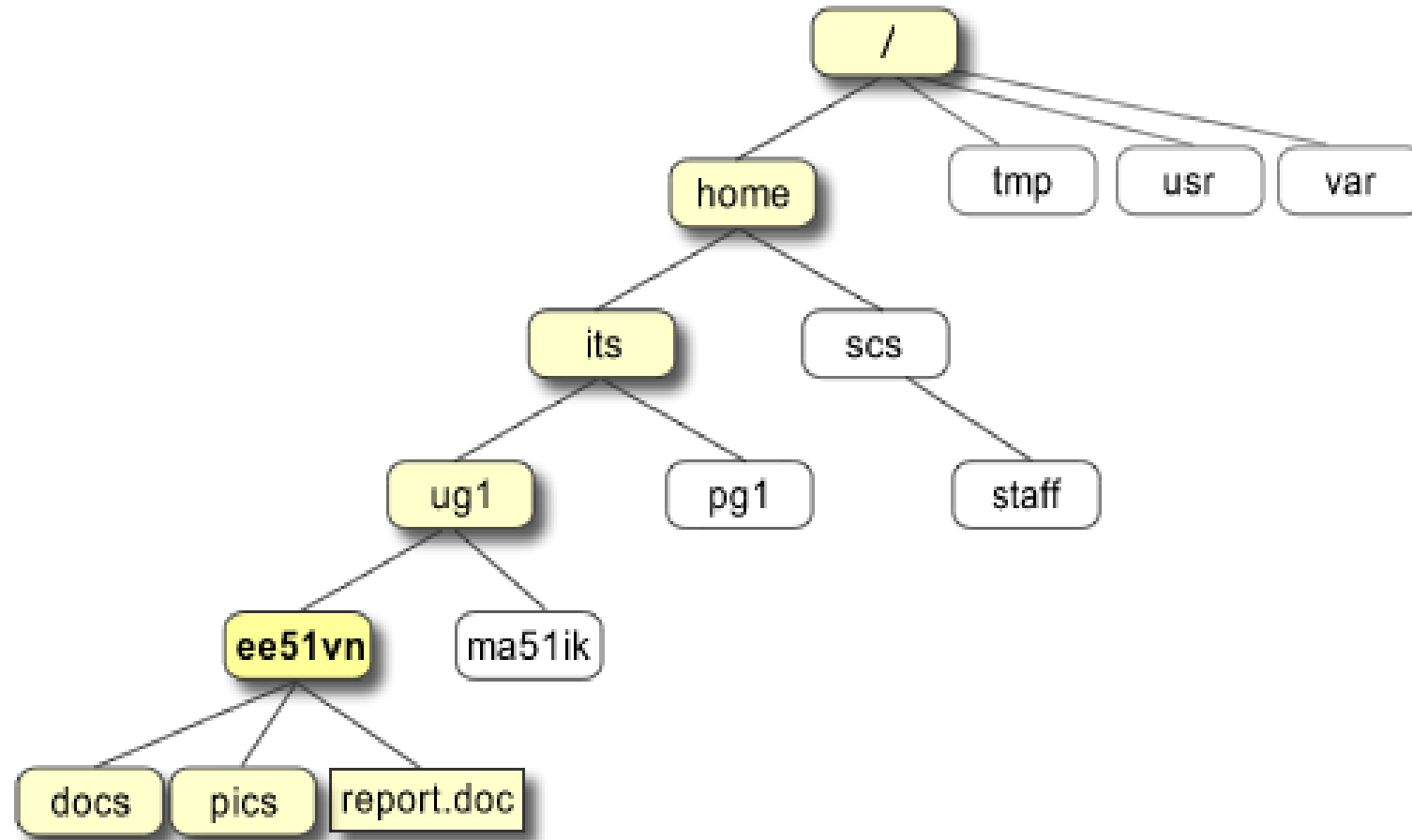
```
31
```

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ echo Namaste
```

```
Namaste
```

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ whoami
```


Linux File Structure



```
sajil@sajil-KY652AA-ACJ- CQ3050IL:~$pwd  
/home/sajil
```

```
sajil@sajil-KY652AA-ACJ- CQ3050IL:~$clear  
sajil@sajil-KY652AA-ACJ- CQ3050IL:~$
```

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ uname  
Linux
```



```
$ls -ltr
```

```
$chmod 777 file.txt
```

```
$mv *.txt ../
```

```
$ ls | grep file_or_folder_you_are_looking
```

```
$ ls | grep .txt
```

```
sajil@sajil-KY652AA-ACJ- CQ3050IL:~$ls
```

11.pdf

Activity files

Adder.ipynb

Desktop

Dist3D

Tab Completion

- Press Tab for auto completion

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ sudo apt
apt-add-repository apt-extracttemplates apt-sortpkgs
apt-cache          apt-ftparchive    apturl
apt-cdrom          apt-get           apturl-gtk
```

Command History

- *Use up and down arrow keys to navigate via previous commands*

sajil@sajil-KY652AA-ACJ-CQ3050IL:~\$*history*

Control+R to search via previous commands

Installation

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ sudo apt-get install cow
```

```
cowbell  cowbuilder  cowedancer  cowsay
```

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ sudo apt-get install cowsay
```

Passing Parameters

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ cowsay NGS Workshop Rocks!
```

```
< NGS Workshop Rocks! >
```

```
-----  
 \   ^__^  
  \_(oo)\_____  
    (____)\       )\/\  
        ||----w |  
        ||     ||
```

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$
```




Getting Help

sajil@sajil-KY652AA-ACJ-CQ3050IL:~\$ **man** cowsay

Passing Parameters

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ cowsay -e nn NGS Workshop Rocks!
```

```
< NGS Workshop Rocks! >
```

```
-----  
 \   ^__^  
  (nn)\_____  
      (_____) \_____)\\/  
      ||----w |  
      ||     ||
```

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~$ cowsay -f tux Hello
```


Identifiying User Input and Output

- `user@host~$ cd /tmp/testing`
- `user@host:testing$ ls`
bears fish mouse
- `user@host~$ echo Have a good day`
Have a good day

Files and Directories

- sahil@sahil-KY652AA-ACJ-CQ3050IL:~/Desktop/Linux\$ tree

├── 1.png

├── 2.png

├── 5.jpg

├── handon.jpg

└── windows.png

Files and Directories

- Creating Directories

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a$ mkdir directoryname
```

- Changing Directories

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a$ cd directoryname
```

- Removing Directories

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a$ rmdir directoryname
```

-

- Exiting from current Directory

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a$ cd ..
```

Files and Directories

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a$ tree
```

```
├── 1
└── 2
    ├── 3
    ├── 4
    └── 5
        └── 6
```

6 directories, 0 files

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a$
```


Creation of files

sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a\$ nano abc.txt

• sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a\$ tree

• .
• └─ 1
• └─ 2
• └─ 3
• └─ 4
• └─ 5
• └─ 6
• └─ abc.txt

• sajil@sajil-KY652AA-ACJ-CQ3050IL:~\$ rm abc.txt

Creation of files

```
sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a$ cd 2/5/6
```

```
•  
•  
• sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a/2/5/6$ ls
```

```
• abc.txt  
•  
•
```

```
• sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a/2/5/6$ wc abc.txt
```

```
• 2      2      8      abc.txt
```

```
• Lines  words  bytes  
•  
•
```


Creation of files

sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a\$ nano abc.txt

• sajil@sajil-KY652AA-ACJ-CQ3050IL:~/a\$ tree

• .
• |
• |— 1
• |— 2
• |
• |— 3
• |— 4
• |— 5
• |
• |— 6
• |
• |— abc.txt

Saving Output to file

```
$ ls >outputlog.txt
```

Checking Sytem Performance

```
$ top
```

Check Web Connection

```
$ ping google.com
```


Listing specific type of files

```
$ ls *.pdf
```

Compressing files

```
$ gzip file.txt
```

Uncompressing files

```
$ gzip -d file.txt.gz
```

- ```
$ unzip text.zip
```

# *Creating Bash Script*

`$ gedit new.sh`

- `echo first command`
- `echo second command`
- `echo third command`

•

`$ chmod a+x new.h`

•

`$/new.sh >outputlog.txt`

•



## *Getting Arguments*

```
$ echo a b c d e f |xargs -n 3
```

## *Finding files*

```
$ find . -name "*.txt"
```

## *Exiting terminal*

```
$ exit
```

- 
-

*Thank You*