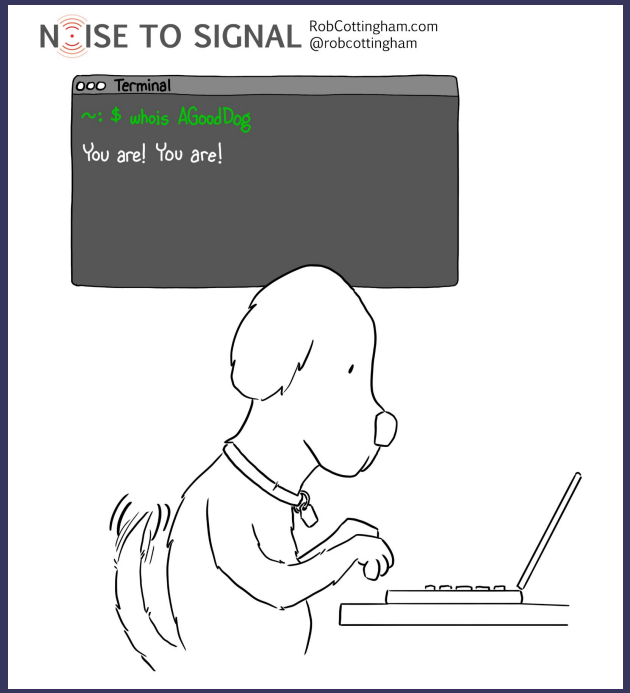
CS4CS

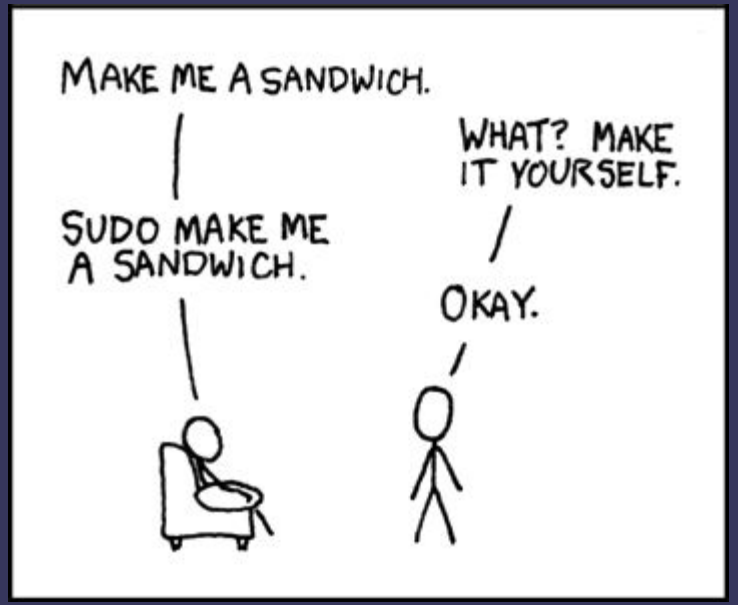



# LINUX BASICS

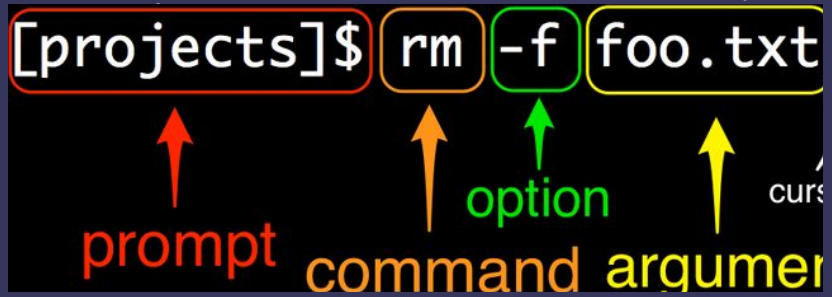
# Let's Begin!

What is the command line?

Text based interface for users to write instructions to computer



# How it works




- Type after the prompt
- Hit enter to execute
- Successful if prompt shows up again on the next line

# Basic commands

- ls
- pwd
- cd

Clear – clean up screen

# More basic commands

- top
- man ls

```
[root@localhost ~]# ping -q fa.wikipedia.org
PING text.pmtpa.wikimedia.org (208.80.152.2) 56(84) bytes of data.
^C
--- text.pmtpa.wikimedia.org ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 540.528/540.528/540.528/0.000 ms
[root@localhost ~]# pwd
/root
[root@localhost ~]# cd /var
[root@localhost var]# ls -la
total 72
drwxr-xr-x. 18 root root 4096 Jul 30 22:43 .
drwxr-xr-x. 23 root root 4096 Sep 14 20:42 ..
drwxr-xr-x.  2 root root 4096 May 14 00:15 account
drwxr-xr-x. 11 root root 4096 Jul 31 22:26 cache
drwxr-xr-x.  3 root root 4096 May 18 16:03 db
drwxr-xr-x.  3 root root 4096 May 18 16:03 empty
drwxr-xr-x.  2 root root 4096 May 18 16:03 games
drwxrwx--T.  2 root gdm  4096 Jun  2 18:39 gdm
drwxr-xr-x. 38 root root 4096 May 18 16:03 lib
drwxr-xr-x.  2 root root 4096 May 18 16:03 local
lrwxrwxrwx.  1 root root   11 May 14 00:12 lock -> ../run/lock
drwxr-xr-x. 14 root root 4096 Sep 14 20:42 log
lrwxrwxrwx.  1 root root   10 Jul 30 22:43 mail -> spool/mail
drwxr-xr-x.  2 root root 4096 May 18 16:03 nis
drwxr-xr-x.  2 root root 4096 May 18 16:03 opt
drwxr-xr-x.  2 root root 4096 May 18 16:03 preserve
drwxr-xr-x.  2 root root 4096 Jul  1 22:11 report
lrwxrwxrwx.  1 root root    6 May 14 00:12 run -> ../run
drwxr-xr-x. 14 root root 4096 May 18 16:03 spool
drwxrwxrwt.  4 root root 4096 Sep 12 23:50 tmp
drwxr-xr-x.  2 root root 4096 May 18 16:03 yp
[root@localhost var]# yum search wiki
Loaded plugins: langpacks, presto, refresh-packagekit, remove-with-leaves
rpmfusion-free-updates                                                   | 2.7 kB     00:00
rpmfusion-free-updates/primary_db                                        | 206 kB     00:04
rpmfusion-nonfree-updates                                                | 2.7 kB     00:00
updates/metalink                                                         | 5.9 kB     00:00
updates                                                                  | 4.7 kB     00:00
updates/primary_db                      73% [=====================        ]  62 kB/s | 2.6 MB     00:15 ETA
```

STUCK? Hit ctrl-c

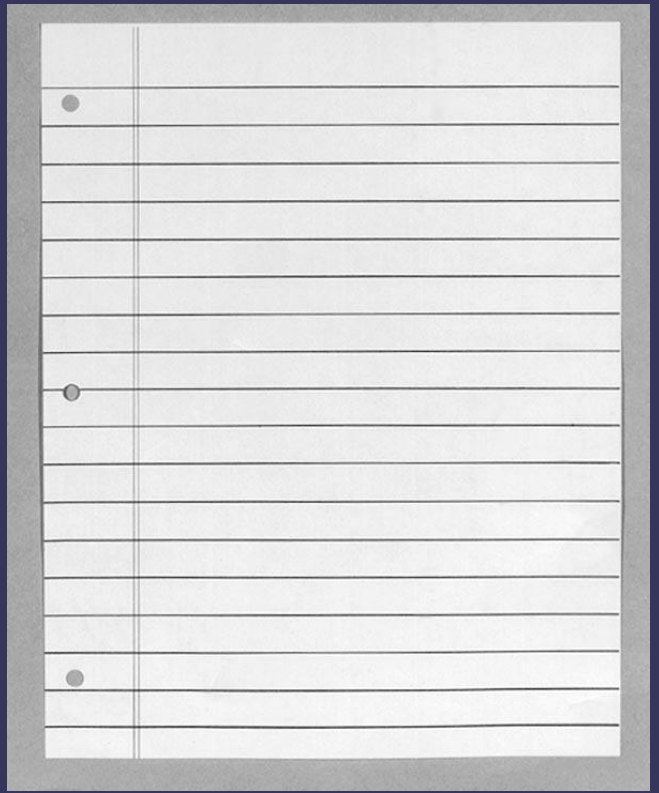
# Create a file

touch wonderfile ← filename

```
ubuntu@ip-10-40-0-174:~$ touch wonderfile
ubuntu@ip-10-40-0-174:~$ ls
Desktop    Downloads  Music     Programming  recover.txt  Videos
Documents  FunFile    Pictures  Public       Templates    wonderfile
ubuntu@ip-10-40-0-174:~$
```

# Explore files

- gedit &
- cat
- more/less
- head/tail
- > vs >>
- tar
- file
- wc (bytes, words, lines)



# More fun with file and directories!

- mkdir
- mv
- cp
- rm

# You can modify the behavior of commands by adding flags

- ls -R
- ls - l
- ls - a
- ls -al
- ls --help
- rm -r

```
ubuntu@ip-10-40-0-174:~/Sandbox$ ls -R
.:
fundir  hithere  wonderfile

./fundir:
wonderfile
ubuntu@ip-10-40-0-174:~/Sandbox$
```

```
ubuntu@ip-10-40-0-174:~/Sandbox$ ls -l
total 4
drwxrwxr-x 2 ubuntu ubuntu 4096 Jul 10 14:53 fundir
-rw-rw-r-- 1 ubuntu ubuntu    0 Jul 10 14:55 hithere
-rw-rw-r-- 1 ubuntu ubuntu    0 Jul 10 14:55 wonderfile
ubuntu@ip-10-40-0-174:~/Sandbox$
```

# Permissions (chmod)

- Owner
- Group
- Public (everyone)

- Read
- Write
- Execute

```
-rw-rw-r-- 1 ubuntu ubuntu 1679 Jun 13 22:08 funFile
```

| - | r | w | x | r | w | x | r | w | x |
|---|---|---|---|---|---|---|---|---|---|
| Is this a directory or other special file? | Can the owner read it? | Can the owner write to it? | Can the owner execute it? | Can the group read it? | Can the group write to it? | Can the group execute it? | Can anyone read it? | Can anyone write to it? | Can anyone execute it? |

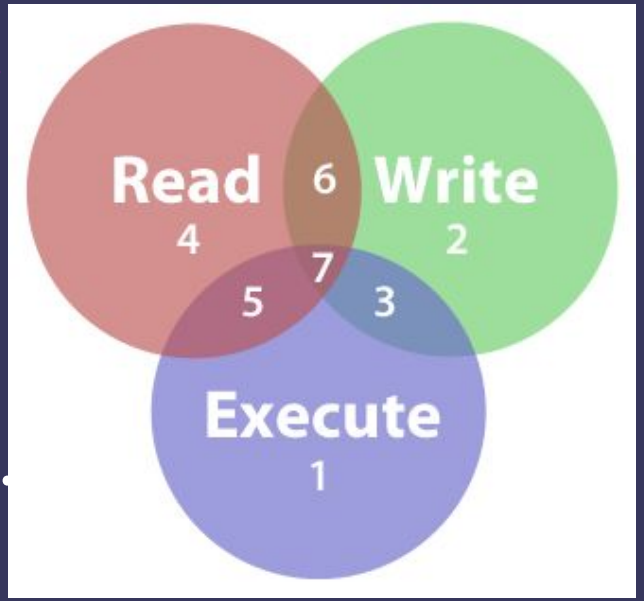
# Overarching principle: Least privilege

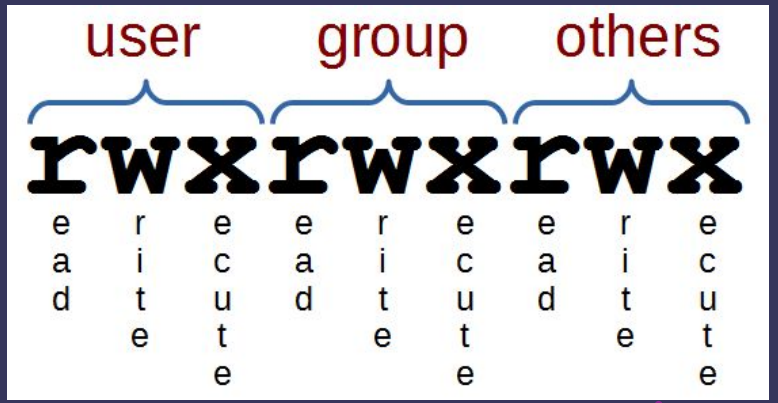
- Grant something the absolute minimum permission it needs to do its job
  - What are these?
    - New file needs to be read by people, and written to by the owner
    - Application needs to be able to run

# Change permissions

- Chmod <permission#> <file/directory name>

$0_8 = 000_2$
$1_8 = 001_2$
$2_8 = 010_2$
$3_8 = 011_2$
$4_8 = 100_2$
$5_8 = 101_2$
$6_8 = 110_2$
$7_8 = 111_2$



# Let's play Terminus!

https://web.mit.edu/mprat/Public/web/Terminus/Web/main.html