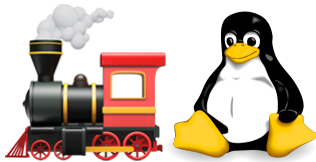


# Linux101 Express

## Introduction to GNU/Linux/Bash

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- Louis
- A5 IOS
- Vice-president of DaVinciCode

- created in 1991 by Linus Torvalds
- GNU/Linux: most used operating system on servers
- Open source

- Born Again SHell
- interpreter
- textual interface with your computer

# Getting the context

*# Where am I?*

```
pwd
```

# Getting the context

```
# Who am i?
```

```
id
```

```
whoami
```

# Getting the context

*# What's in my directory?*

ls

# Getting the context

*# What am I connected to?*

```
uname -a
```



# Getting the context

*# What am I connected to?*

ip a

# Read the f(ancy|ucking) manual

Almost all commands display help when you type:

```
man bash  
# or  
bash --help
```

# Moving around directories

```
cd /home/louis # Change Directory  
cat, xxd, head, tail, diff, less  
mkdir  
touch, rm  
cp  
mv  
nano, vim
```

# Ownership and permissions

Use the **sudo** prefix to execute the command as the superuser (admin).

```
sudo  
chmod  
chown
```

# Finding files

```
find  
locate  
which  
grep # Find inside a file
```

# Piping



You can pipe commands together and use the output of a command into another command:

```
grep -v '#' main.py | wc -l
```

# Stream redirection

- two primary streams: stdin (input) and stdout (output)

```
echo 'hello' > summary.txt  
base64 -w 0 < summary.txt > summary.txt.b64
```

# Installing programs (Debian/Ubuntu)

```
apt update # download packages information  
apt install vim
```



# Compressing and archiving

```
tar xvf archive.tar.gz  
gzip -d archive.gz  
unzip archive.zip
```

# Never forgetti

If you forget a command that you already typed, check your history!

```
history  
history | grep 'ssh'
```

You can also use Ctrl+R to search in your history directly from the command line.

# Networking

```
ping # send ICMP requests
nc # raw TCP sessions
ssh # Secure SHell
curl # send HTTP requests
wget # send HTTP requests
traceroute # see the route of a TCP packet to a given host
nslookup # send DNS requests
dig # send DNS requests
```

# Processes

```
ps # list all processes  
pstree # list all processes with parents/children  
systemctl # service manager
```

# Bash scripting

```
for offset in {1..100}
do
    curl http://images.amazing.school/?image=$offset
done
```

- **EVERYTHING** is a file
  - e.g. keyboard events are accessible @ `/dev/input/event0`, the brightness of your screen @ `/sys/class/backlight`
- a file is a collection of data stored in one unit

## Going further

- *The Missing Semester of Your CS Education* at <https://missing.csail.mit.edu/>