Crashing into EECS like a wrecking ball
Quick Poll
Quick Poll

Mac -- Windows -- Linux
Quick Poll

Mac -- Windows -- Linux

Terminal/command line
Quick Poll

Mac -- Windows -- Linux
Terminal/command line
SSHed into CAEN
Quick Poll

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Git
Quick Poll

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Terminal/command line
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Git
Vi/Vim or Emacs
Linux/Unix: What is it?
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Unix

- Proprietary (think: costs money, closed source)
- Kernel + GUI pieces + everything else that comprises an OS
- Comes from specific vendors
- Ex. Solaris
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- Open sauce kernel developed by Linus Torvalds and fam (not actually family)
- Technically just kernel (no GUI or commands)
- GNU (GNU’s not Unix) + Linux == OS
- Ex. Ubuntu is built on top of Debian which is built on top of Linux
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EECS 482 for more background on what a kernel and OS is
If you are ever wondering what to do with those extra engineering prints
Enough talk, let's play
Fire up a terminal
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- What is this?
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Fire up a terminal

- What is this?
- Not magic
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Two images of the same directory structure
Enough talk, let's play

Fire up a terminal

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- Not magic

Two images of the same directory structure

We'll hit up our friend `tree` later, he/she/it/tree is pretty cool
Let's play around a bit:

- `cd` change directory
- `pwd` print working directory
- `ls` list files
- `mkdir` make directory
- `touch` `FILENAME` create an empty file if it doesn't yet exist
- `mv` `SRC_FILE` `DESTINATION` move file(s) around
- `rm` `FILENAME` remove files
- `rm -r` `DIRECTORY` remove directories
Still no clue...
Still no clue...

- What do you do when you have a question?
Still no clue...

- What do you do when you have a question?
- Ask for...
Still no clue...

- What do you do when you have a question?
- Ask for...

**help!**
Several ways of getting help

- `help CMD`
- `man CMD`
- `info CMD`
- `CMD --help` or `CMD -h` sometimes works

Knowing a bit about what's on this slide should help with a future homework...
But one towers over the rest...
But one towers over the rest...

...not really, but it's the most commonly used
But one towers over the rest...
...not really, but it's the most commonly used

**Manual**

Opens a document with another command called **less**

- `q` (quit)
- `j` down one line at a time
- `k` up one line at a time
- `d` (own) half a page at a time
- `u` (p) half a page at a time
- `/searchPattern` ex. `/output`
- `n` (ext) occurrence of search
- `g` (o to) top of page
- `Shift + G` jumps to bottom of page

Still more commands, but not as commonly used
Let's explore a bit with **man**

- Might as well bring back our friend **tree**
Let's explore a bit with man
- Might as well bring back our friend tree

What if man pages didn't suck so much?
WARNING: TOO COOL COMMAND AHEAD!!!!
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You've been warned. Proceed with caution
tldr

Too long; didn't read

- Use it the same way as `man`

To install

- Mac: `brew install tldr`
- Ubuntu: multiple methods
  - One option: `sudo apt install python-pip && pip install tldr`
  - Another: `sudo apt install npm && npm install -g tldr`
  - Otherwise refer to: [https://github.com/tldr-pages/tldr](https://github.com/tldr-pages/tldr)

Take a minute and install it
tldr

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Take a minute and install it

Try it out on a few commands. `tree`, `man`, even `tldr` itself
You've earned it
SSH and CAEN

Start out with a `man ssh` to feel our way around. Or better yet, try out `tldr ssh`
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- `ssh uniqname@login.engin.umich.edu`
SSH and CAEN

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Cool! What's actually happening?
SSH and CAEN

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Cool! What's actually happening?

Let's make it easier

Add:

```
Host caen
    HostName login.engin.umich.edu
    User uniqname
```

to `~/.ssh/config`
SSH and CAEN

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• `ssh uniqname@login.engin.umich.edu`

Cool! What's actually happening?

Let's make it easier

Add:

```
Host caen
    HostName login.engin.umich.edu
    User uniqname
```

to `~/.ssh/config`

Now you can type `ssh caen` and give your password to login
Let's set up ssh keys with GitHub

- `ssh-keygen -t rsa -b 4096 -C your_email@example.com`
  - On Mac: `cat ~/.ssh/id_rsa_github.pub | pbcopy` (install `pbcopy`)
  - On Ubuntu: `cat ~/.ssh/id_rsa_github.pub` and then copy it to your clipboard
- Go to [https://github.com/settings/keys](https://github.com/settings/keys)
- Do NOT copy the `~/.ssh/id_rsa_github` key. That one is *private*
Let's set up ssh keys with GitHub

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Add this to your `~/.ssh/config` file:

```
Host github.com
  HostName github.com
  User git
  IdentityFile ~/.ssh/id_rsa_github
```
Let's set up ssh keys with GitHub

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  - On Mac: `cat ~/.ssh/id_rsa_github.pub | pbcopy` (install `pbcopy`)
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- Go to [https://github.com/settings/keys](https://github.com/settings/keys)
- Do NOT copy the `~/.ssh/id_rsa_github` key. That one is private

Add this to your `~/.ssh/config` file:

```plaintext
Host github.com
  HostName github.com
  User git
  IdentityFile ~/.ssh/id_rsa_github
```

What if working with `git` didn't have to suck so much?
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You've been warned. Proceed with caution
scm_breeze makes git life easier

- Check it out:
  https://github.com/scmbreeze/scm_breeze

- Install it:

  ```
git clone git://github.com/scmbreeze/scm_breeze.git ~/.scm_breeze
~/.scm_breeze/install.sh
source ~/.bashrc  # or source ~/.zshrc
  ```

Let's mess around
You've earned it
Getting repos on CAEN

- Create a local repo `git init`
- Create a repo on GitHub [https://github.com/new](https://github.com/new) (give it whatever name you like)
- Follow the steps on GitHub for creating a new repo
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Also check out [https://c4cs.github.io/commands/Caen-Connect-Tutorial](https://c4cs.github.io/commands/Caen-Connect-Tutorial)
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Also check out https://c4cs.github.io/commands/Caen-Connect-Tutorial

For more cool ideas

- https://dotfiles.github.io/
Vim

Three main modes
- Insert (regular typing)
- Normal (issue commands to do things)
- Visual (highlight and select text)

Normal mode commands
- :q (uit)
- :w (rite)
- j down
- k up
- gg (go to top of file)
- Shift + G (go to bottom of file)
- dd delete line
- yy yank (copy) line
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Another awesome trick

`z` - jump around

https://github.com/rupa/z

After you `cd` around a bit, `z` builds up a database that lets you quickly jump to where you need to go

- ex. `z 398` takes you to your `398` folder
Another awesome trick

**z** - jump around

https://github.com/rupa/z

After you `cd` around a bit, **z** builds up a database that lets you quickly jump to where you need to go

- ex. `z 398` takes you to your `398` folder

How to install

- On Mac with `brew`:
  - `brew install z`
- On Ubuntu:
  - `git clone https://github.com/rupa/z ~/z`
  - `echo ". ~/z/z.sh" >> ~/.bashrc`
You made it!