

# Signals & Filesystems

Lecture 17

March 21st 2023 | COMP 211-002 | Joshua Bakita

# Welcome!

## Today:

- Recap
- Signals
- Intermission: Inside a Server
- Filesystems (Brief)

## Logistics:

- More assignment  
Assignment 4 details coming soon; this should be intended to be much easier than Assignment 3

Fun fact...

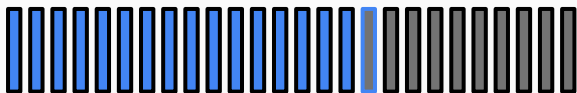
*From normal mode, you can type `dd` to dele`te` the current line in vim, and `p` to paste the deleted line*

*Bonus: prefix a number to delete multiple lines, eg. `8dd` to delete the current line and the following seven*

# Recap: Where are we?

## Statistical Progress

This is Lecture 17 of 26 (class 18 of 28)



We are currently on assignment 4 of 6



Midterm 2 is next Tuesday



## Content (since Midterm 1)

- 2s complement
- Dynamic memory allocation (malloc(), realloc(), free()...)
- Compiling, linking, and multi-file C programs
- (Basics) Virtual memory, processes, and syscalls
- Profiling with perf and flamegraphs
- Basic computer organization, and the performance implications

# Signals

How does the operating system signal a program?

## Signals

# What are signals for?

Some things we may want to tell a process:

	<b>Signal:</b>	<b>Default Action:</b>	<b>Send via Console:</b>
→ Exit	SIGINT	Terminate	Ctrl+c
→ Stop	SIGSTOP	Stop	Ctrl+z
→ Continue	SIGCONT	Continue	
→ Invalid memory access	SIGSEGV	Terminate & Core Dump	
→ Force close	SIGKILL	Terminate	

We can use signals to do this!

Read more: `man 7 signals`

Signals

Demo: Sending Signals

## Signals

# What are signals for?

Some things we may want to tell a process:

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Read more: `man 7 signals`

But what if we want to do something  
other than the default action?

## Signals

# Custom Signal Handlers

There's an API for that!

- `man 2 signal` (deprecated) *OR*
- `man 2 sigaction`

Let's build a console takeover program!



## Signals

# Demo: Catching SIGSEGV

Try it yourself!

```
$ wget https://www.cs.unc.edu/~jbakita/teach/comp211-s23/l17/handle\_fault.c  
$ gcc handle_fault.c -o handle_fault  
$ ./handle_fault
```

## Signals

# Demo: An "Unkillable" Program

Try it yourself!

```
$ wget https://www.cs.unc.edu/~jbakita/teach/comp211-s23/l17/handler.c  
$ gcc handler.c -o handler  
$ ./handler
```

# Intermission: Inside a Server

# Filesystems

A file format for files?

# Questions?

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