Rust Setup

Lecture 1

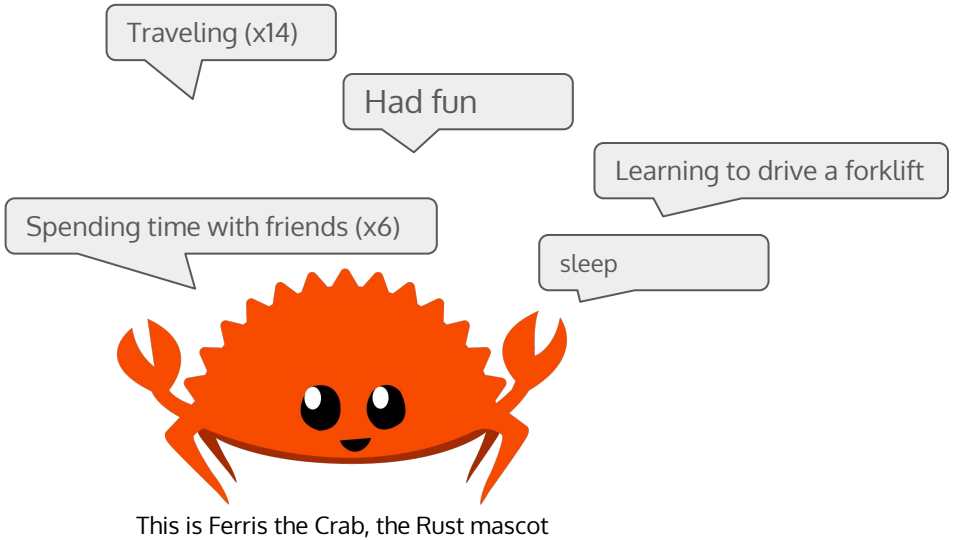
Slides: Neil Kaushikkar (Adapted from William Eustis)

Goals For Today

- Discuss more about the course
- Explore the Rust environment
- Hello, CS 128 Honors!

But First...

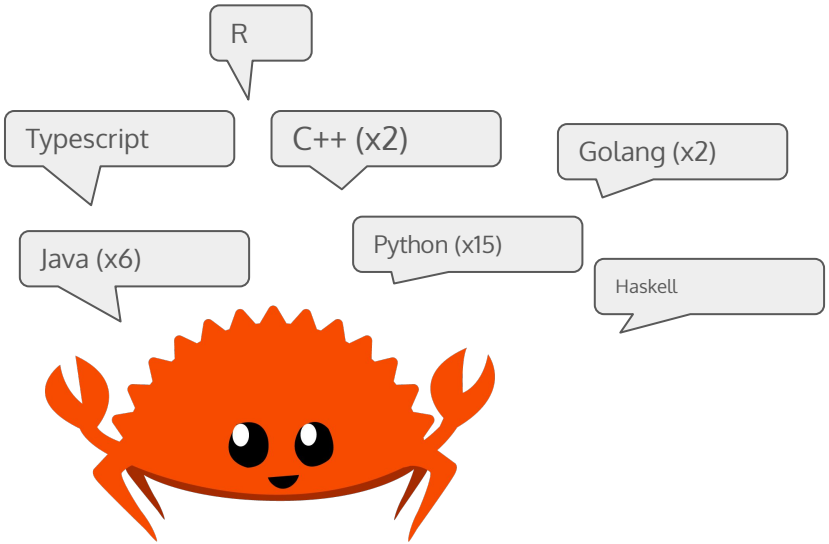
What did you do this summer?



This is Ferris the Crab, the Rust mascot

But First...

What is your favorite programming language to work with?



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But First...

What are your favorite pastas?

Spaghetti (x5)

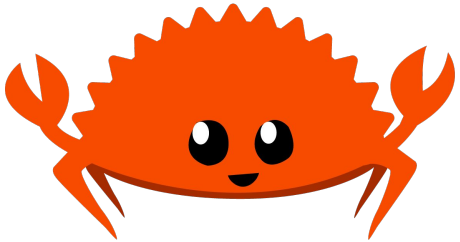
Tagliatelle

Penne (x5)

Rotini

calamarata

Farfalle



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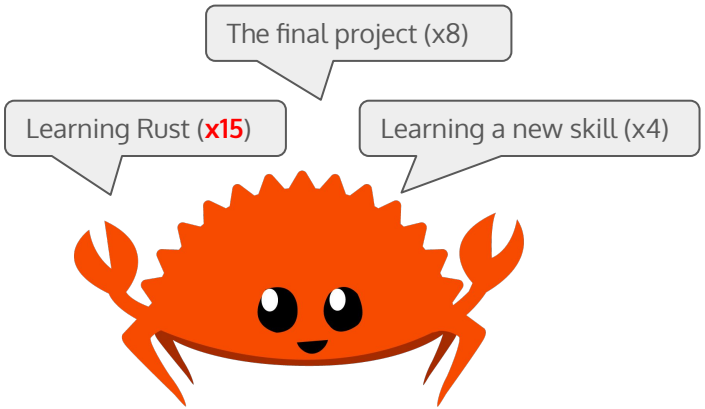
But First...

What are you most looking forward to in the course?



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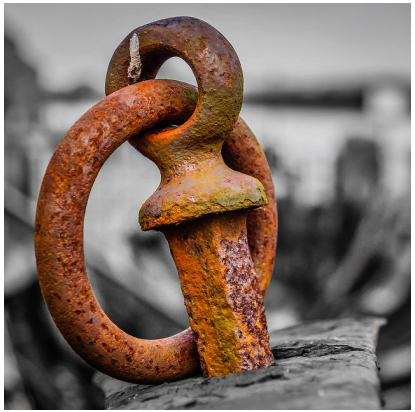

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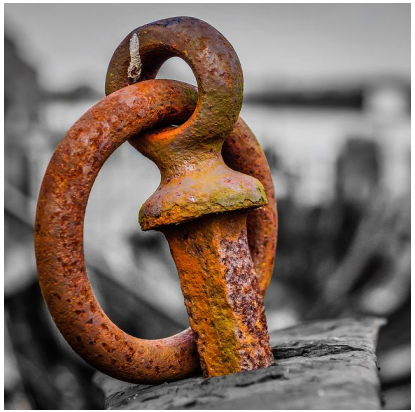

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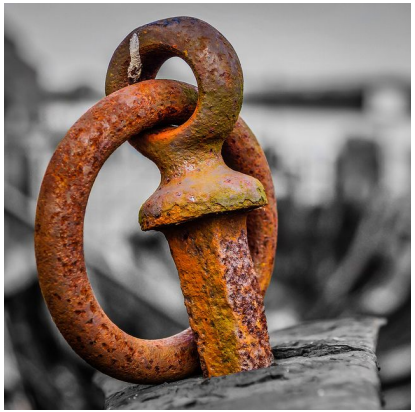

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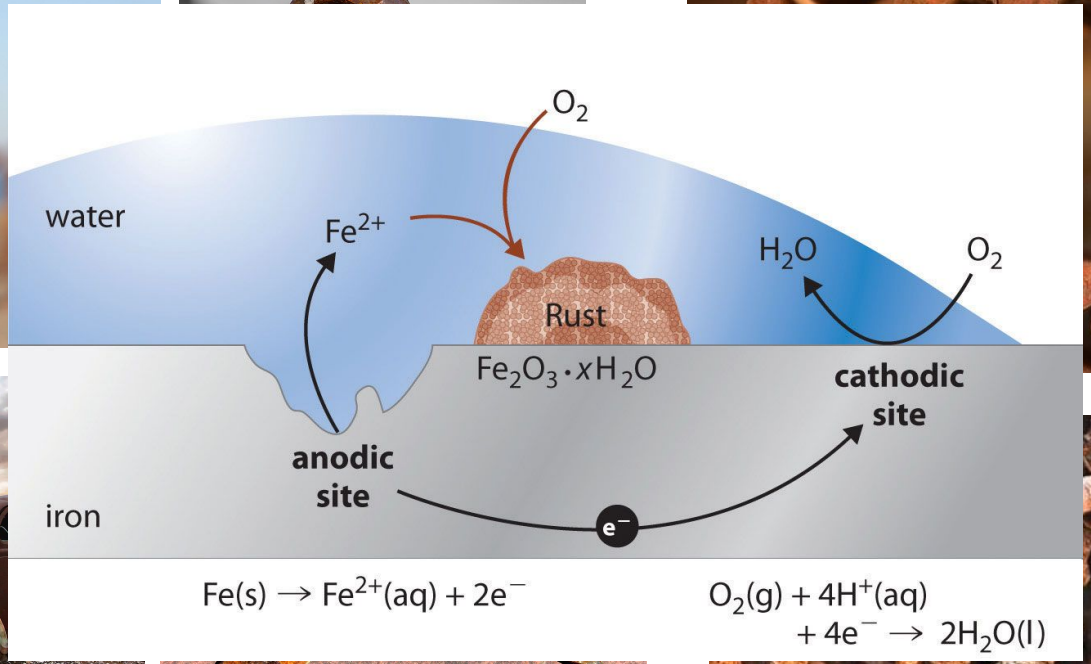

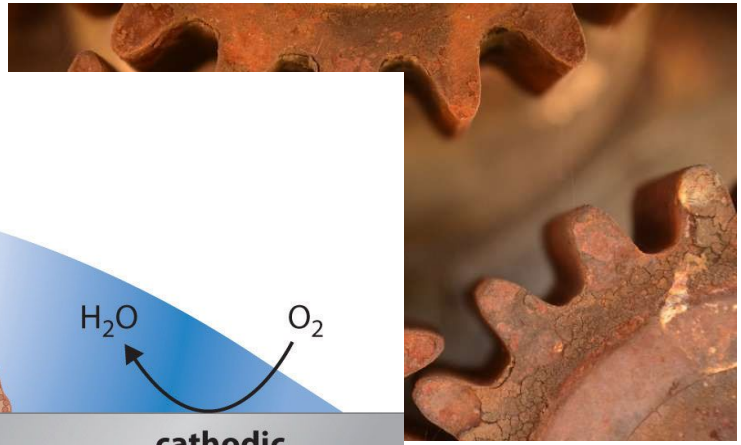

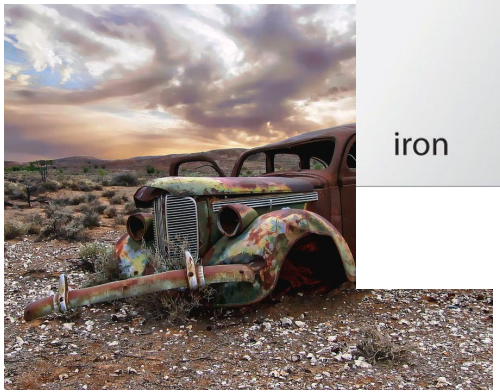

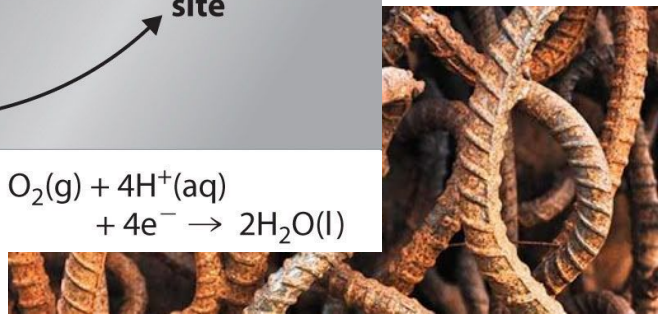

So... What is Rust?

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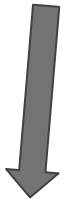

Programming Paradigms:
Categorizing programming languages based on their features

So... What is Rust?

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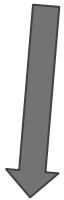

Programming Paradigms:
Categorizing programming languages based on their features

Multi-Paradigm:
Languages that support several programming paradigms and don't restrict the programmer to a single paradigm

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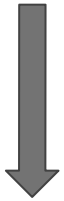

Systems Programming Language:
Systems programming aims to produce software and software platforms which provide services to other software, are performance constrained, or both

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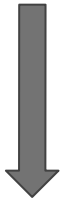

Systems Programming Language:
Systems programming aims to produce software and software platforms which provide services to other software, are performance constrained, or both

System programming languages are designed to provide easy **access to the underlying hardware** and for **performance**

How will we learn Rust?

- We will often refer to the Rust textbook in our lectures
  - Google “Rust Textbook” - it’s free online
  - https://doc.rust-lang.org/book/

How will we learn Rust?

- Rust is already installed in your CS128 virtual machine
- Please test this whenever possible with **cargo -V**

```
vagrant@0d603b65c801:~$ cargo -V
cargo 1.57.0 (b2e52d7ca 2021-10-21)
vagrant@0d603b65c801:~$
```

Cargo?

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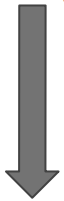
- Cargo is Rust's **build system** and **package manager**



Build System:
Cargo **compiles*** your Rust project so that it can be executed by your computer

* Technically rustc is Rust's Compiler. Cargo acts as an abstraction layer that manages packages, handle metadata, and invokes rustc for you

Cargo?

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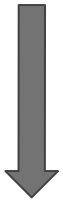

Package Manager:
Modern projects depend on external packages and libraries. A package manager handles those packages (and the packages that they might depend on)

Cargo?

- Cargo is Rust's **build system** and **package manager**
- How will we (primarily) use Cargo?
  - Compile and execute your code
  - Download and manage packages you use (final project!)

Hello, CS 128 Honors

Let's go through the process of creating some Rust code from scratch

1. Create a new project
2. Edit your code*
3. Compile
4. Run

* You should use whatever editor you want, but we recommend VSCode with the rust-analyzer extension

Seems Easy Enough?

Cargo Commands

- **cargo new** – creates a new Rust project
- **cargo build** – compile and build the code in your project
- **cargo run** – (build if not already built) & run the compiled code
- **cargo check** – check for syntax errors without compiling
- **cargo clean** – clear the project of all compiled sources

That’s All Folks!