



Rust Setup

Lecture 1

Goals For Today



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

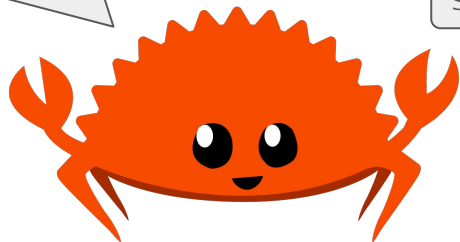
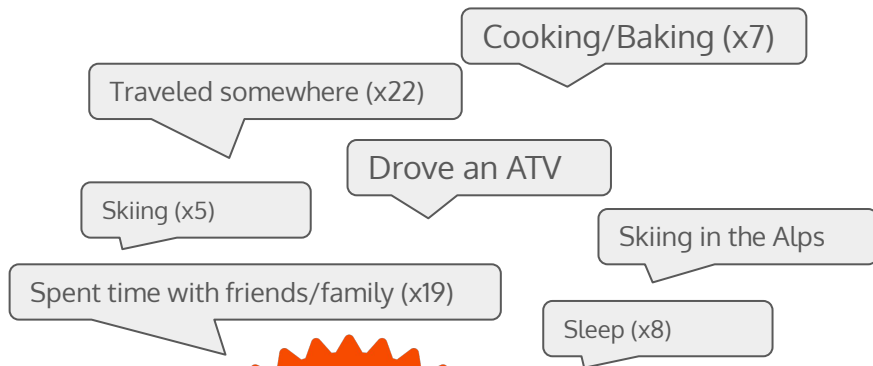
More Course Info



- Lectures will be posted on the website, on YouTube, and on Discord
 - Website: <https://honors.cs128.org/lectures>
- You can view the schedule on the website
 - This will barely change - most things are set for the semester
- OPTIONAL In-Person Discussion Section
 - Mondays 6-7:30pm (Location TBD)
 - We will:
 - Introduce MPs + give some hints
 - Review content from lecture
 - Collaborative Coding
 - Q&A and more!

But First...

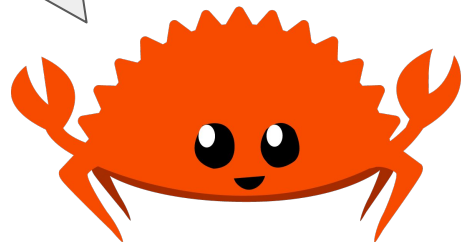
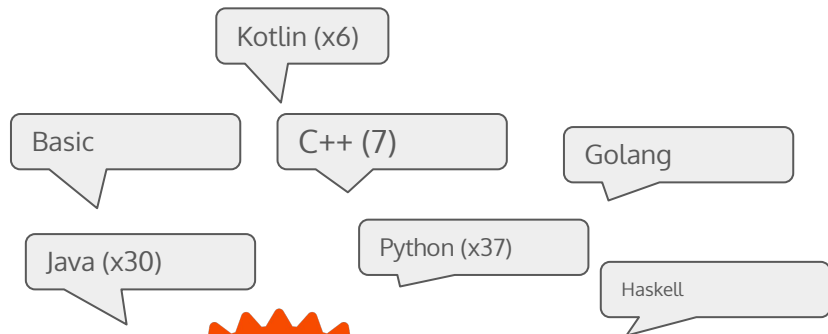
What did you do during winter break?



This is Ferris the Crab, the Rust mascot

But First...

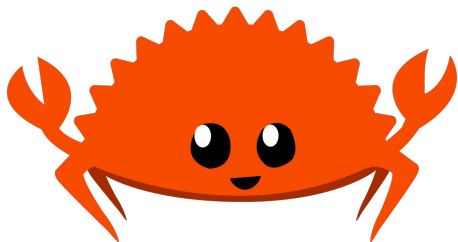
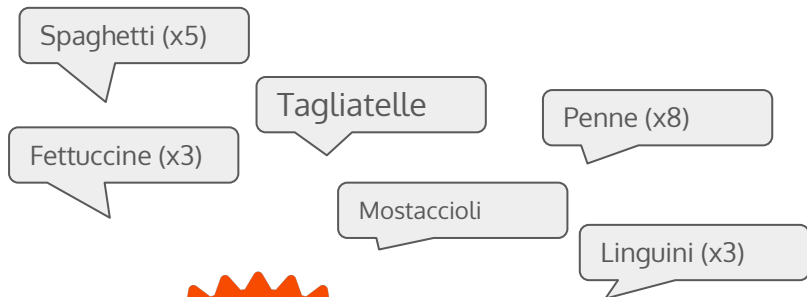
What is your favorite programming language to work with?



This is Ferris the Crab, the Rust mascot

But First...

What are your favorite pastas?



This is Ferris the Crab, the Rust mascot

But First...



What are you most looking forward to in the course?

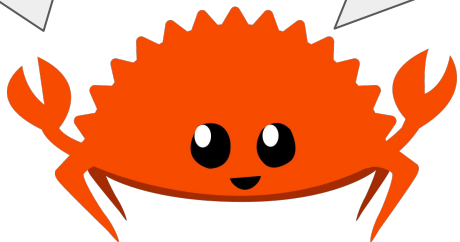
Making friends/meeting new people (x5)

The final project (x14)

Learning Rust (**x31**)

Learning a new skill (x13)

Web3/Blockchain (x3)



This is Ferris the Crab, the Rust mascot

So... What is Rust?



So... What is Rust?



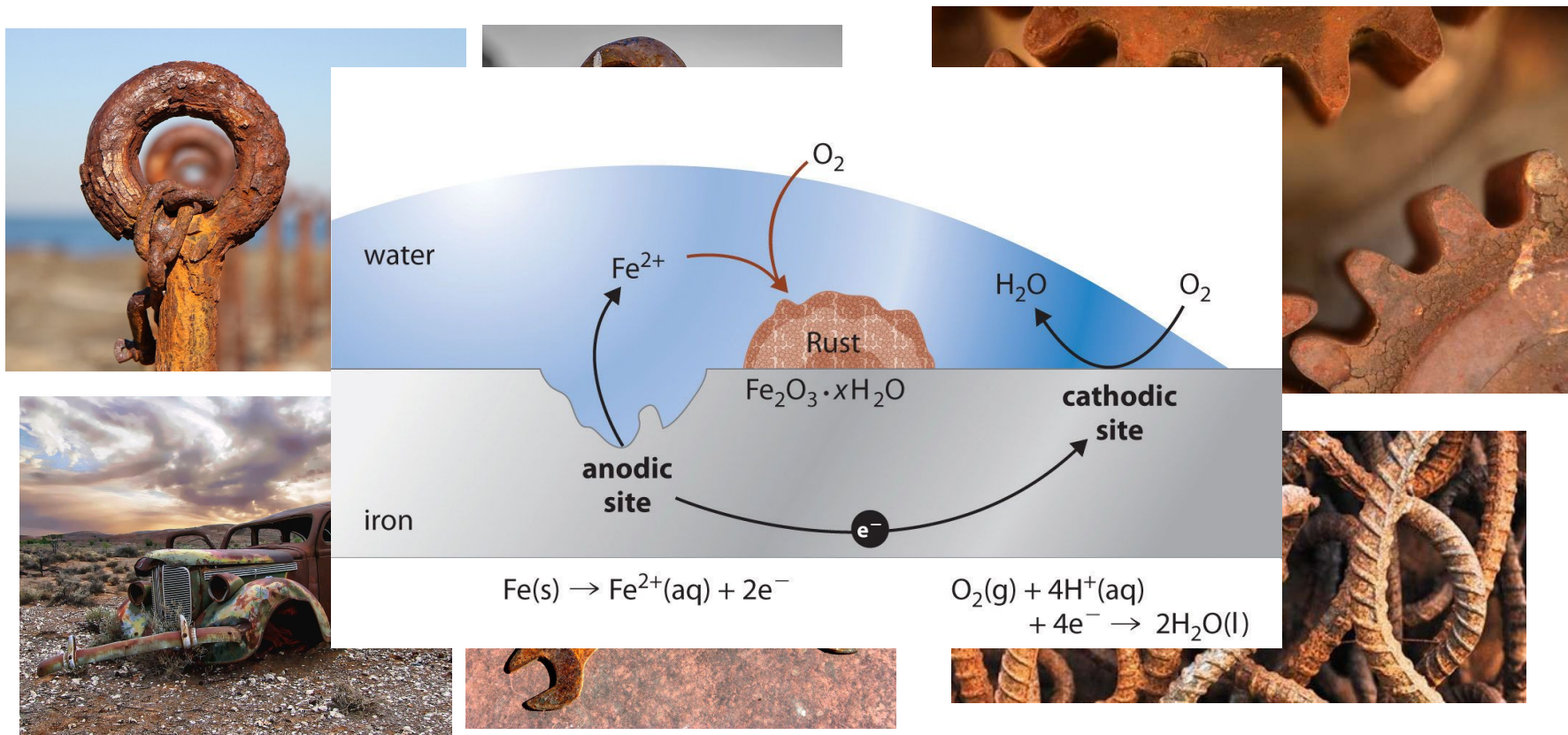
So... What is Rust?



So... What is Rust?



So... What is Rust?



So... What is Rust?

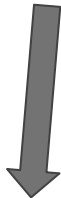


- Rust is a **multi-paradigm system programming** language

So... What is Rust?



- Rust is a **multi-paradigm** system programming language

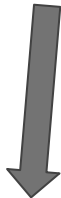


Programming Paradigms:
Categorizing programming
languages based on their
features

So... What is Rust?



- Rust is a **multi-paradigm** system programming language



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

So... What is Rust?



- Rust is a multi-paradigm **system programming** language



Systems Programming Language:

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

So... What is Rust?



- Rust is a multi-paradigm **system programming** language



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:~$
```

- Install Rust on your own computer (<https://www.rust-lang.org/tools/install>)!
 - OR just Google "Install Rust" and follow the instructions on the 1st link

Cargo?



Cargo?



Cargo?



Cargo?



- 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?



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



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!)
 - When you submit assignments on PrairieLearn, our autograder uses cargo to test your code (even though you never run a command with cargo)!

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!