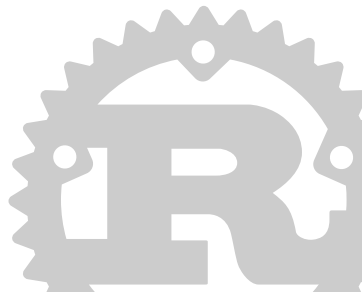


Rust in 5 minutes

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Coredump Hackerspace Rapperswil, Switzerland



What is Rust?



What is Rust?

*«Rust is a systems programming language
that runs blazingly fast, prevents nearly all segfaults,
and guarantees thread safety.»*

— www.rust-lang.org



Features of Rust

- zero-cost abstractions
- move semantics
- guaranteed memory safety
- threads without data races
- trait-based generics
- pattern matching
- type inference
- minimal runtime
- efficient C bindings



Control vs Safety?

C / C++

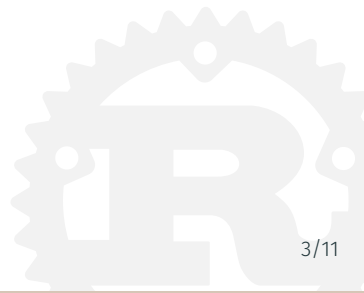
Java / C#

Python / Ruby



More Control

More Safety



Control vs Safety?

C / C++

Java / C#

Python / Ruby



More Control

More Safety



Control vs Safety?

C / C++

Java / C#

Python / Ruby



More Control

More Safety

Rust

More control and more safety



Control vs Safety?

C / C++

Java / C#

Python / Ruby



More Control

More Safety

Rust

More control and more safety

Fast, safe, concurrent, pick three!

A System Programming Language

- Fine grained control over memory
- Close to bare metal
- It's possible to write an OS kernel with it

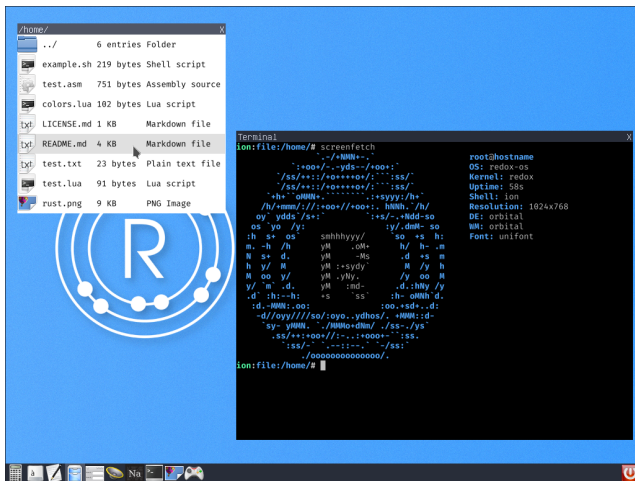


Figure 1: <https://www.redox-os.org/>

Blazingly Fast

- Compiled language
- Uses LLVM for optimizations
- Zero cost abstractions



- No null pointers
- No dangling pointers
- No data races



Figure 2: Average C++ programmer

- Every resource has *one owner*
- Variables are *moved* to new locations
- Owned values can be *borrowed*
 - Either: *One mutable* borrow
 - Or: *Many immutable* borrows
- These rules are enforced by the compiler

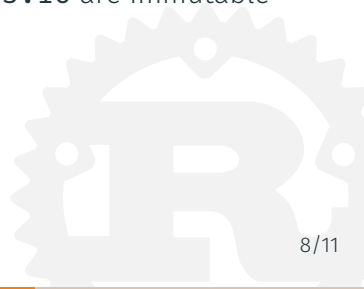


Cargo





- Awesome project and package manager
- Fetches and builds your project's dependencies
- Invokes rustc or another build tool with the correct parameters to build your project
- packages on <https://crates.io> are immutable
→ No leftpad like disasters



Community



- Rust is known for its friendly and welcoming community
- The language is developed in the open through RFCs
- Active discussion on Github, Reddit, IRC, and the forum



Rust is already used by companies¹

- Mozilla: Servo, the Parallel Browser Engine
<https://servo.org>
- Dropbox²
- Maidsafe — The New Decentralized Internet
<http://maidsafe.net>
- Parity — Next Generation Ethereum Client
<https://ethcore.io/parity.html>

¹<https://www.rust-lang.org/en-US/friends.html>

²https://www.reddit.com/r/rust/comments/4adabk/the_epic_story_of_dropboxs_exodus_from_the_amazon/

Code Example



Code Example

- Traits based generics
- Pattern matching
- Type inference

```
fn main() {  
    let program = "+ + * - - /";  
    let mut accumulator = 0;  
    for token in program.chars() {  
        match token {  
            '+' => accumulator += 1,  
            '-' => accumulator -= 1,  
            '*' => accumulator *= 2,  
            '/' => accumulator /= 2,  
            _ => { /* ignore everything else */ }  
        }  
    }  
    println!("The program \"{program}\" calculates the value {accumulator}",  
            program, accumulator);  
}
```

Output: "The program "+ + * - - /" calculates the value 1"

Thank you!

www.coredump.ch

