

# KernelModule<Rust>

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# What is Rust?

- ▶ Systems Programming Language developed at Mozilla
- ▶ Used by Mozilla (Servo HTML renderer), Discord, Threema and many more
- ▶ Why Rust? (according to their own website)
  - ▶ Performance: No runtime or garbage collection allows for very fast code
  - ▶ Reliability: Rich type system and ownership model help guarantee memory safety
  - ▶ Productivity: Useful documentation and modern tooling

## Example code

```
// u32 is an unsigned 32bit integer
fn fib(n: u32) -> u32 {
    // expressions can be used as values
    let result = match n {
        // match expressions can use ranges
        0..=1 => 1,
        _ => fib(n - 1) + fib(n - 2),
    };
    // implicit return
    result
}

fn main() {
    println!("Hello, Rust!");
    for i in 0..5 {
        println!("fib({}) = {}", i, fib(i));
    }
}
```

# Rust in the Linux kernel

- ▶ Strong FFI allows interfacing with C code
- ▶ Multiple previous projects exist
- ▶ However, these are all proof of concept rather than functional modules

# Our goals

- ▶ Get a Rust kernel module running
- ▶ Port the ext2 file system to Rust
- ▶ Compare performance and ease of programming