Rust Basel

Rust 101 @ BaselHack 2025

About Rust-Basel

Non-profit swiss association
Founded in March

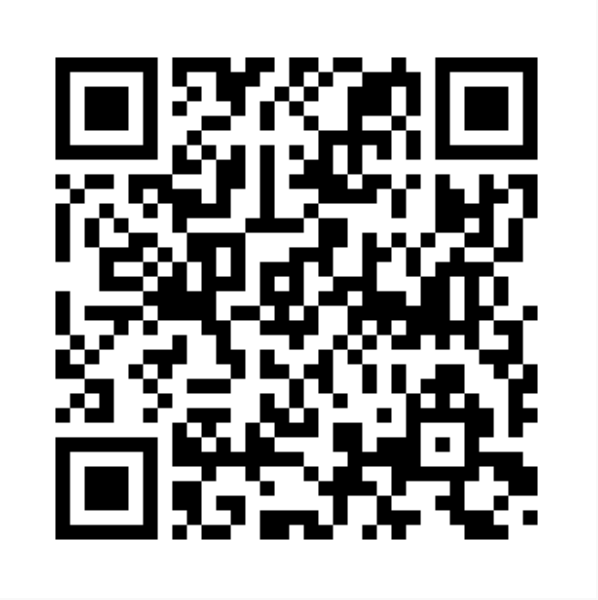




https://rust-basel.ch

What we do today

1. What makes the language great (tooling, ecosystem)
2. How you do things in Rust (branches, loops, classes etc.)
3. Open Challenge: (Advent of Code 2022)



https://github.com/yguenduez/rust-101-slides

Goal: You can write small programs

Some Prerequisites

Install Rust

```
curl --proto '=https' --tlsv1.2 -sSf https://sh.rustup.rs | sh
```

Ecosystem - Cargo is everything

Let’s create a hello world rust project

```
cargo new my_first_rust_project
cd my_first_rust_project
# Builds and runs the project
cargo run
# Just build the project
cargo build
```

Ecosystem - project structure

```
your-project
├─ src/
│  ├─ main.rs
│  └─ (lib.rs)
├─ target/
│  └─ /debug
│     └─ <binary>
├─ Cargo.toml
└─ Cargo.lock
```

- **src**: Source files
- **target**: Binary files (libraries/executables)
- **Cargo.toml**: Meta info (dependecies, authors, licenses etc.)
- **Cargo.lock**: pinning dependencies to a specific version (hash)

Ecosystem - Where to find libs?

Libraries

- Crates.io
- lib.rs

Ecosystem - adding a library

```
cargo add serde -F derive
cargo add serde_json
cargo add --dev rstest
```

-F/—feature: libs come with feature flags

—dev: dev/test dependencies

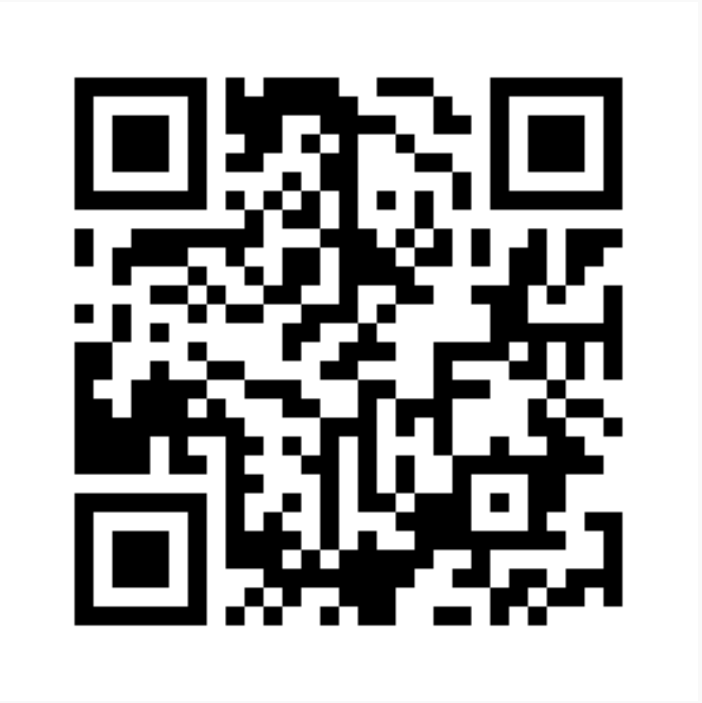
Ecosystem - tooling

```
# build/runs your code
cargo build/run (--release)
# formats your code
cargo fmt
# lints your code
cargo clippy
# executes your tests
cargo test
# generates documentation
for your crate
cargo doc (--open)
```

```
# Updates the rust compiler
rustup update
# Install other toolchain
(e.g. iOS on ARM64)
rustup target add aarch64-
apple-ios
# To then build against
that target
cargo build --release --
target aarch64-apple-ios
```

Second part of the workshop

https://github.com/yguenduez/rust-101



Basics - Core Concepts - Ownership

```rust
#[derive(Debug)]
struct Number(i32);

fn main(){
  let x = Number(5);
  let y = x;

  // Won't compile, as x does not own
  // Number anymore - Number got "moved"
  // to y
  println!("Number: {:?}", x);
}
```

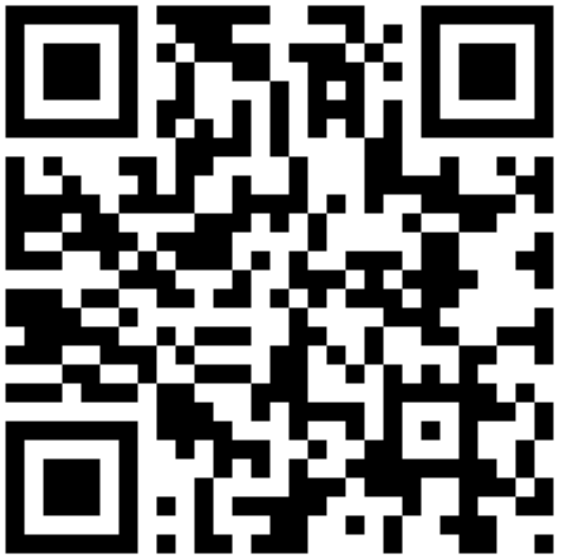
Basics - Core Concepts - Borrowing

```rust
#[derive(Debug)]
struct Number(i32);

fn main(){
  let mut x = Number(5);
  let y = &x; // immutable borrow
  let z = &mut x; // mutable borrow

  // Won't compile - we cannot have a read-only
  // borrow and a mutable borrow
  // at the same time
  println!("We use y {:?} and z {:?}", y,z);
}
```

Third part of the workshop

Try to solve the first challenge of Advent-of-Code 2022, with the Rust basics you learned =).

https://github.com/yguenduez/rust-101-aoc



Additional Resources

Great Books for Beginners

- The Rust Programming Language
- Rust by Example

Hands-On

- Rustlings