
CARGO

What is Cargo?

- Cargo is Rust's build system and package manager
- Bundled with Rust installation (*cargo --version*)
- Source files should live in *src* directory
- *crates.io* is central package registry

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What is Cargo?

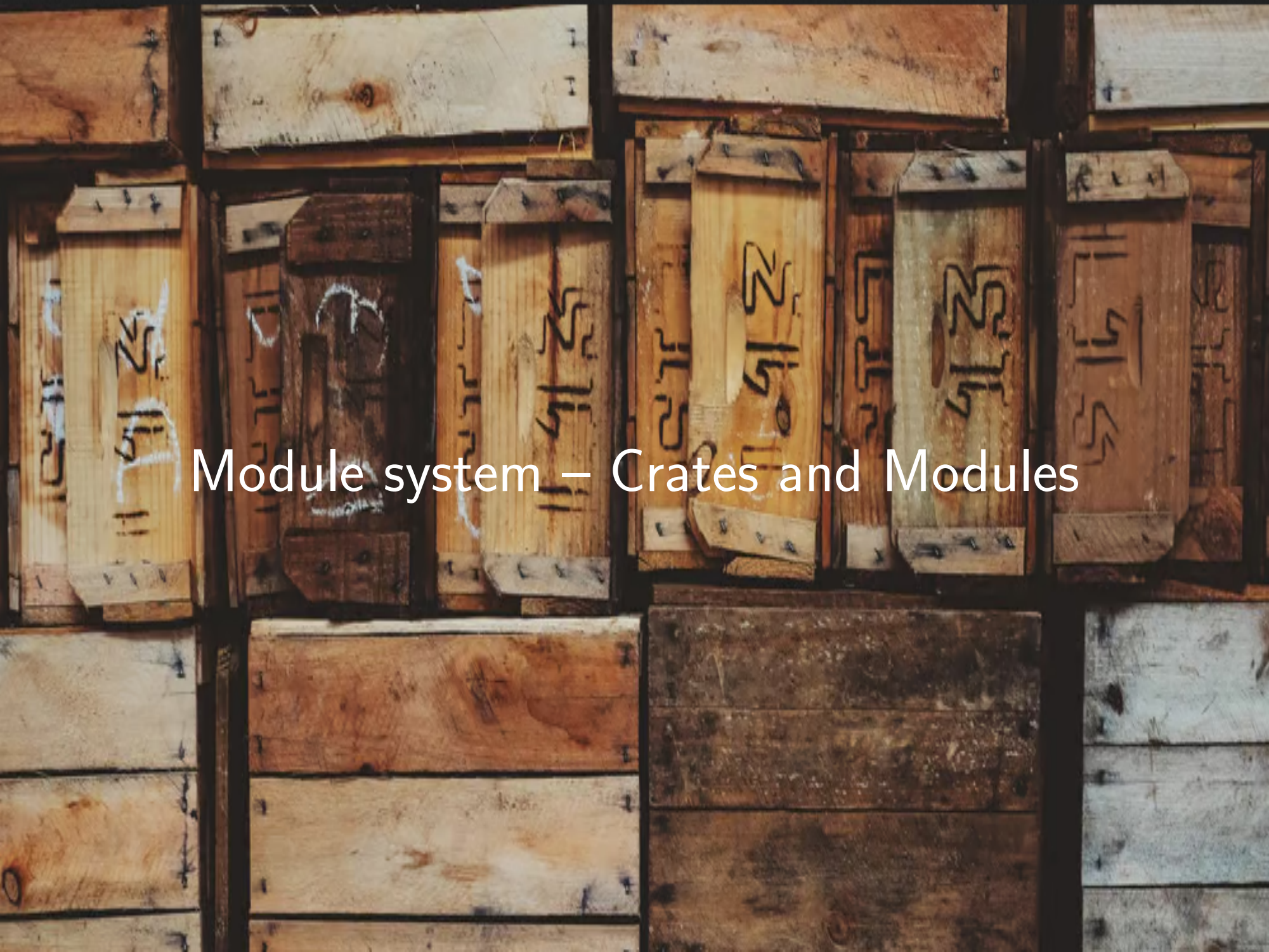
```
manfred@AO-PF1T704D:~/rust$ cargo new hello_world
     Created binary (application) `hello_world` package
manfred@AO-PF1T704D:~/rust$ cd hello_world/
manfred@AO-PF1T704D:~/rust/hello_world$ cargo add rand
    Updating crates.io index
      Adding rand v0.8.5 to dependencies.
             Features:
             + alloc
             + getrandom
             + libc
             + rand_chacha
             + std
             + std_rng
             - log
             - min_const_gen
             - nightly
             - packed_simd
             - serde
             - serde1
             - simd_support
             - small_rng
    Updating crates.io index
manfred@AO-PF1T704D:~/rust/hello_world$ cat Cargo.toml
[package]
name = "hello_world"
version = "0.1.0"
edition = "2021"

# See more keys and their definitions at https://doc.rust-lang.org/cargo/reference/manifest.html

[dependencies]
rand = "0.8.5"
manfred@AO-PF1T704D:~/rust/hello_world$
```

Building with Cargo

- To build a project use *cargo build* and *./target/debug/hello_cargo* to run executable
- *cargo run* can be used to build and run in one step
- For finished project use *cargo build --release*

Rust editions

- Rust language has six-week release cycle – smaller updates more frequently
- Every two or three years a new Rust edition is produced
- New editions ship as part of the six-week release process
- Editions serve different purposes for different people
- The edition key in Cargo.toml indicates which edition the compiler should use for code.
- All Rust compiler version support any edition that existed prior to that compilers release



Module system – Crates and Modules

How to organize code

- Module: Collection of items like functions, structs, traits and impl blocks
  - The use keyword creates shortcuts to items
- Crate: Tree of modules producing a library or executable.
- Crate Root is source file that Rust compiler starts from to make up root module of crate
  - Binary Crates – Crate Root: src/main.rs
  - Library Crates – Crate Root: src/lib.rs
- Package: A bundle of one or more crates (contains *Cargo.toml*)
- Paths: A way of naming an item to show Rust where to find an item in a module trees
  - Absolute path – Full path starting from crate root
  - Relative Path – Starts from current module (self, super)

How to organize code

When declaring a module in crate root, the compiler looks in these places

- Inline
- In src/<module-name>.rs
- In src/<module-name>/mod.rs

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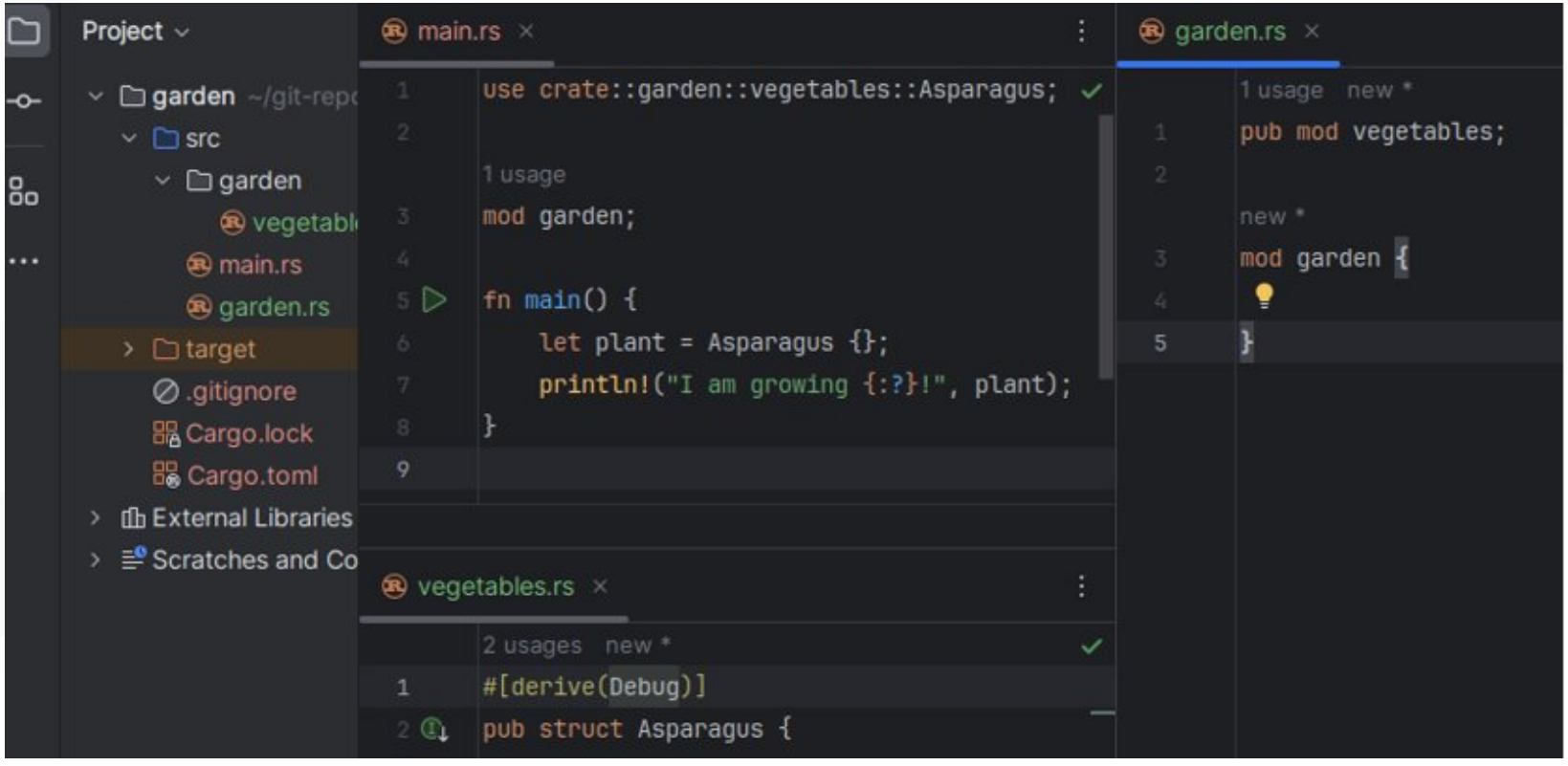
How to organize code



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References

1. *module-system-title-image*
2. *cargo-title-image*