**Packages and Crates**

# Package

A package is one or more crates that provide a set of functionality.

A package contains a Cargo.toml file that describes how to build those crates.

A package can contain at most one library crate. It can contain as many binary crates as you would like, but it must contain at least one crate (either library or binary).

# Crates

## 1. Binary Crate

A crate can be a binary crate or a library crate.

Binary crates are programs you can compile to an executable that you can run, such as a command-line program or a server.

They must have a function called main that defines what happens when the executable runs.

## 2. Library Crate

Library crates don’t have a main function, and they don’t compile to an executable.

They define functionality intended to be shared with multiple projects.

# Crate Root

The crate root is a source file that the Rust compiler starts from and makes up the root module of your crate.

Cargo follows a convention that src/main.rs is the crate root of a binary crate with the same name as the package.

If the package directory contains src/lib.rs, the package contains a library crate with the same name as the package, and src/lib.rs is its crate root.

Cargo passes the crate root files to rustc to build the library or binary.

If a package contains src/main.rs and src/lib.rs, it has two crates: a binary and a library, both with the same name as the package.

A package can have multiple binary crates by placing files in the src/bin directory: each file will be a separate binary crate

Lib crate  
  
root:  
src/lib.rs

bin crate - 1  
  
root:  
src/main.rs

bin crate - n  
  
root:  
src/main.rs

Package

# Example

$ cargo new my-project

Created binary (application) `my-project` package

$ ls my-project

Cargo.toml

src

$ ls my-project/src

main.rs

Cargo created a Cargo.toml file, giving us a package.

Package only contains src/main.rs, meaning it only contains a binary crate named my-project.

src/main.rs is the crate root of binary crate.

# References

<https://doc.rust-lang.org/book/ch07-01-packages-and-crates.html>

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