Rust Opening

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1 About Rust

1.1 What is Rust

A language empowering everyone to build reliable and efficient software.

1.2 Why Rust?

1.2.1 Performance

Rust is blazingly fast and memory-efficient: with no runtime or garbage collector, it can power performance-critical services, run on embedded devices, and easily integrate with other languages.

1.2.2 Reliability

Rust's rich type system and ownership model guarantee memory-safety and thread-safety — enabling you to eliminate many classes of bugs at compile-time.

1.2.3 Productivity

Rust has great documentation, a friendly compiler with useful error messages, and top-notch tooling — an integrated package manager and build tool, smart multi-editor support with auto-completion and type inspections, an auto-formatter, and more.

2 Getting started

2.1 Installing Rust

You can try Rust online in the Rust Playground without installing anything on your computer.

Rustup: the Rust installer and version management tool

The primary way that folks install Rust is through a tool called Rustup, which is a Rust installer and version management tool.

It looks like you're running macOS, Linux, or another Unix-like OS. To download Rustup and install Rust, run the following in your terminal, then follow the on-screen instructions. See "Other Installation Methods" if you are on Windows.

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

Is Rust up to date?
Rust updates very frequently. If you have installed Rustup some time ago, chances are your Rust version is out of date. Get the latest version of Rust by running:

```
rustup update
```

learn more about installation.

2.2 Cargo

Cargo is the Rust build tool and package manager. When you install Rustup you'll also get the latest stable version of the Rust build tool and package manager, also known as Cargo. Cargo does lots of things:

- build your project with cargo build
- run your project with cargo run
- test your project with cargo test
- build documentation for your project with cargo doc
- publish a library to crates.io with cargo publish

2.3 Verify Installation

To test that you have Rust and Cargo installed, you can run this in your terminal of choice:

```
cargo --version
```

3 Generating a new project

Let's write a small application with our new Rust development environment. To start, we'll use Cargo to make a new project for us. In your terminal of choice run:

```
cargo new hello-rust
```

This will generate a new directory called hello-rust with the following files:

```
hello-rust
|- Cargo.toml
|- src
|- main.rs
```

Cargo.toml is the manifest file for Rust. It's where you keep metadata for your project, as well as dependencies.

src/main.rs is where we'll write our application code.

cargo new generates a "Hello, world!" project for us! We can run this program by moving into the new directory that we made and running this in our terminal:

```
cargo run
```

You should see this in your terminal:

```
$ cargo run
   Compiling hello-rust v0.1.0 (/home/amir/w/Rust/hello-rust)
    Finished dev [unoptimized + debuginfo] target(s) in 1.34s
     Running `target/debug/hello-rust`
Hello, world!
```