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["Unrecognized option 'release'" when compiling with rustc in release mode](#)

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I have a simple `.rs` file and want to compile it using `rustc`. I always heard about how important it is to compile in release mode, because otherwise my Rust program will be slow.

However, if I use the often quoted `--release` flag, it doesn't work. What is everyone talking about if the flag doesn't even exist?

```
$ rustc --release foo.rs
error: Unrecognized option: 'release'.
```

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You made a simple mistake: **The `--release` flag is a flag for `cargo`. The easiest way you can turn on optimizations with `rustc` is using the `-O` flag.**

Examples:

```
rustc -O foo.rs
rustc -C opt-level=3 foo.rs
cargo build --release
```

A bit more detail:

You can compile your Rust program with various levels of optimization. `rustc -C help` says:

```
-C opt-level=val      -- optimize with possible levels 0-3, s, or z
```

To have the most control, you should compile with `rustc -C opt-level=3 foo.rs` (or any other level). However, this isn't always necessary. Often, you can use `-O`; `rustc --help` says:

```
-O                      Equivalent to -C opt-level=2
```

Most of the time `rustc -O foo.rs` is the right choice.

Cargo, on the other hand, works a bit different; or at least the `--release` flag does. Cargo has different *profiles* which dictate how cargo invokes `rustc`. The most important ones are `dev` (*development- or debug-mode*) and `release`. The `--release` flag switches the default profile from `dev` to `release` (duh!). This potentially changes many flags of the `rustc` invocation. Most importantly, it changes the values for `opt-level` and `debuginfo`:

```
$ rustc -C debuginfo=2 -C opt-level=0    # in `dev` profile/debug mode
$ rustc -C debuginfo=0 -C opt-level=3    # in `release` profile
```

You can even change the settings for each profile in your `Cargo.toml`. You can find more information on profiles and on the default values used in [this Cargo documentation](#).

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[edited Oct 28, 2019 at 12:02](#)

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