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Understanding Rust lifetime and borrow checker [duplicate]

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[Why can't I store a value and a reference to that value in the same struct?](#) (2 answers)

Closed 2 years ago.

Rust newbie here. Can anyone please help me understand why Rust doesn't like this code and how it can be fixed?

```
struct Foo {
    num: u32
}

struct Bar<a> {
    foo: Foo,
    num_ref: &a u32,
}

fn foo<a>() -> Bar<a> {
    let f = Foo { num: 2 };
    let n: &a u32 = &f.num;
    return Bar { foo: f, num_ref: n };
}

fn main() { }
```

I basically want a function that returns a `Bar`, which owns `Foo` and a reference to `num` (owned by `Foo`).

[Link to playground](#)

Error:

```
error[E0597]: `f.num` does not live long enough
  --> src/main.rs:12:23
   |
12 |   let n: &a u32 = &f.num;
   |                   ^^^^^ borrowed value does not live long enough
13 |   return Bar { foo: f, num_ref: n };
   |   ^- borrowed value only lives until here
   |
note: borrowed value must be valid for the lifetime 'a as defined on the function body at 10:8...
  --> src/main.rs:10:8
   |
10 | fn foo<a>() -> Bar<a> {
   |   ^^
```

Thanks in advance!

[rust](#)

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edited Jan 8 '19 at 11:29



Peter Hall

41.4k ● 11 ● 90 ● 157

asked Jan 8 '19 at 6:40



Felipe Lima

10k ● 4 ● 38 ● 38

1

I really do ask myself why you ever want that? You already own the variable, why do you need a reference to it? You can get it for free, you don't have to waste 8bytes for that.

– hellow

Jan 8 '19 at 7:37

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The compiler is saying that you are borrowing `f.num` inside the scope of the function and once this scope is done the reference to `f.num` doesn't live anymore.

I'm not sure if [this example of code](#) can help you, let me know. I don't know if "a reference to num" in your case is important but it doesn't seem to be necessary and maybe you didn't see how to achieve that.

I recommend you to read and take the time to understand how the [ownership system](#) works in Rust. It can be a little bit tedious at the beginning but you will master the concept with practice.

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edited Jan 8 '19 at 10:36



Bhargav Rao

43.8k • 27 • 118 • 130

answered Jan 8 '19 at 9:25



Julian Didier

69 • 5

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