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## [Rust slice ownership outlives its scope](#)

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I'm getting mad trying to wrap my head around a Rust lifetime issue. When running the following code:

```
use std::fs::File;
use std::io::Read;
use std::clone::Clone;

const BUFSIZE : usize = 4096;

struct LexBuf<T: Read> {
    f: T,
    buf: [u8; BUFSIZE],
    tail: usize,
    head: usize
}

impl <T : Read> LexBuf<T> {
    fn fetch(&mut self) {
        let keepSize = self.head - self.tail + 1;
        let mut tmpBuf;
        {
            let tmpSlice = &self.buf[self.tail..self.head+1];
            tmpBuf = tmpSlice.clone();
        }
        &mut self.buf[0..keepSize]
            .clone_from_slice(tmpBuf);
        let mut n = self.f
            .read(&mut self.buf[keepSize..]).unwrap();
        if n < BUFSIZE - keepSize {
            self.buf[keepSize+n] = 0;
        }
    }
}
```

I expect that the fact `tmpSlice` is in its own scope will allow me to borrow `self.buf` afterwards but it seems that the borrow checker doesn't agree as it says that `tmpSlice`'s borrow ends at the `fn fetch` scope.

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`clone` doesn't create an owned copy, it just clones the reference, not what the reference points at, you want `to_owned`

`oli_obk` – [oli\\_obk](#)

2016-04-06 09:07:58 +00:00

Commented Apr 6, 2016 at 9:07

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Of course it does not agree, because the lifetime of `tmpBuf` doesn't end in the inner block. `clone()` called on a slice returns a copy of that slice, that is, a copy of a pointer and a length. For all intents and purposes, the slice returned by `tmpSlice.clone()` is equivalent to `tmpSlice`, including its lifetime. Because you assign it to `tmpBuf` in the outer scope, it naturally outlives the scope of the inner block.

Actually, if Rust allowed it, your code would break - `clone_from_slice()` source and destination could overlap. For example, if `self.tail` is 0 and `self.head` is, say, 10, then the source and the destination overlap completely.

Unfortunately, there is no way to create a fixed-size stack array with size determined at runtime, so the only way around this is to allocate the data on the heap by calling `to_owned()` or `to_vec()` on the slice to obtain `Vec<u8>`.

Alternatively, you can allocate a second fixed-size array which is guaranteed not to be smaller than the one in the structure, and use it as a temporary space. You would need to use `clone_from_slice()` two times for that.

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