# CMPT 383: Vitamin #9

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## Introduction

This Vitamin is to help you practice lifetimes and borrowing in Rust. The test suite is provided in `src/lib.rs`. You should fill out the function definitions in `src/functions.rs`.

This submission will be partially autograded. There are some portions of the assignment that are ungraded, and some that will be graded. We provide a (partial) test suite for partial validation. You can run these tests by opening a terminal in the v7 directory, and running `cargo test`.

We have omitted all imports. If you import additional functions, you may get a zero on the assignment.

## 1 `prefixes`

The `prefixes` function returns all prefixes of a provided string. The empty string is a prefix of every string. For example the prefixes of `"Hi"` are `""`, `"H"`, and `"Hi"`.

Using string slices will be quite helpful. As a reminder, you can get the substring of `s` between `i` (inclusive) and `j` (exclusive) with the syntax: `&s[i..j]`. For example: `&"Hello"[1..3] == "el"`

## 2 `return_if_satisfies_both`

The `return_if_satisfies_both` function is provided a higher-order function (`f`) and two borrowed values (`x` and `y`). If `f(x)` and `f(y)` both evaluate to true, a Some Option should be returned, containing a tuple with both `x` and `y`. If at least one of them evaluate to false, a None option should be returned. Currently, the function signature returns an option with incorrect lifetimes: `Option<(&'static T,&'static T)>`. To get the desired function to compile, you will need to change the lifetime in the return type.

## 3 `map`

The `map` function will involve re-implementing the Haskell map function on the List data type. The List data type involves using a Box. You can see an example of building lists by looking at the tests. Apply the provided

## 4 `concat`

The `concat` function will involve re-implementing the Haskell `(++)` function on the List data type. Note: you are permitted to use the `clone()` method in exactly one of the cases.