

S4.2: Expression Evaluation: Improving Performance

CSci 2041:

Advanced Programming Principles

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Exercise #1: Tail recursive length

What is the tail recursive version of the `length` function?

Recall

```
let rec length lst = match lst with  
  | [] -> 0  
  | _::xs -> 1 + length xs
```

Exercise #2: Using folds

Write a tail recursive version of `length` using `List.fold_left` or `List.fold_right`.

Recall

```
let rec length lst = match lst with
| [] -> 0
| _::xs -> 1 + length xs
```

Exercise #3: Fibonacci numbers

What is the tail recursive version of the `fib` function?

```
let rec fib n = match n with
  | 0 -> 0
  | 1 -> 1
  | n -> fib (n-1) + fib (n-2)
```