

# CSE 341

Section 3  
Justin Harjanto

## Agenda

HW2 Issues  
SML Docs for HW3  
More functions  
Java 8 Streams

## The problem

```
fun earlier x = ... other x ...  
fun later x = ... other x ...  
fun other x = earlier x ... later x ...
```

The above doesn't work because earlier and later don't have reference to the other binding!

## Solutions?

If earlier and later aren't used anywhere else, then have other define them locally instead!

```
fun other x = let  
  fun earlier x ...  
  fun later x ...  
in  
  earlier x ... later x ...  
end
```

## Or... use mutual recursion!

In HW2, there are some problems where you want this

This is a common idiom in SML and other languages

Mutual recursion uses the and keyword

```
fun even 0 = true  
  | even n = odd (n - 1)  
and odd 0 = false  
  | odd n = even (n - 1)
```

## SML Docs

Useful skill to look at docs!

Don't want to reimplement something that's already in standard lib

Two of the most useful pages for this next homework:

<http://sml-family.org/Basis/string.html>

<http://sml-family.org/Basis/list.html>

## map, filter, and reduce explained with emoji 🤪

```
map([👩, 🍷, 🍷, 🍷], cook)  
=> [🍷, 🍷, 🍷, 🍷]
```

```
filter([🍷, 🍷, 🍷, 🍷], isVegetarian)  
=> [🍷, 🍷]
```

```
reduce([🍷, 🍷, 🍷, 🍷], eat)  
=> 🍷
```

## Higher Order Functions

See code!