Mutual Recursion

What if we need function f to call g, and function g to call f?
Mutual Recursion

Does this work?

\begin{align*}
1 & \text{fun } f \ x = & \quad 5 & \text{fun } g \ y = \\
2 & \ldots & \quad 6 & \ldots \\
3 & g \ y & \quad 7 & f \ x \\
4 & \ldots & \quad 8 & \ldots 
\end{align*}
Mutual Recursion

We can employ higher order functions for a work around.

```plaintext
fun earlier (f, x) = ... f y ... 
...

fun later x = ... earlier(later, y)
```
Mutual Recursion

But ML gives us special syntax for this

1 fun f x = 5 and g y =
2     ... 6     ...
3   g y 7   f x
4     ... 8     ...
Remember that signatures are good both for organization and management and for maintaining invariants
Modules - Invariants

• Ordering of operations
  o e.g. insert, then query
• Data kept in good state
  o e.g. fractions in lowest terms
• Policies followed
  o e.g. don't allow shipping request without purchase order
• Sensitive information hidden
  o e.g. force authentication for api use
Currying and Higher Order Functions

Questions?