

CS603 Programming Language Organization

Lecture 23

Spring 2004

Department of Computer Science

University of Alabama

Example: merge sort

- ```
fun msort L =
 let val halves = split L
 in merge (msort (hd halves))
 (msort (hdtl halves))
 end

fun split [] = [[], []]
 | split [a] = [[a], []]
 | split (a::b::t) =
 let val splittl = split t
 in [a::(hd splittl),
 b::(hdtl splittl)]
 end;
```

Pair up:  
Write merge

# merge

- ```
fun merge ([], ys)      = ys
  merge (xs, [])       = xs
  merge (x::xs, y::ys) =
    if x <= y then x::merge(xs, y::ys)
    else y::merge(x::xs, ys);
```

Algebraic Data-types

- ```
datatype 'a tree = Empty
 | Node of 'a tree *
 'a *
 'a tree
```

```
fun height Empty = 0
 | height (Node (lft, _, rht)) =
 1 + max (height lft, height rht)
```

# Resources

- “Programming in Standard ML”
  - <http://www-2.cs.cmu.edu/~rwh/smlbook/offline.pdf>
- Source code from above book
  - <http://www-2.cs.cmu.edu/~rwh/smlbook/examples/>
- Moscow ML
  - <http://www.dina.dk/~setsoft/mosml.html>