

Recap



COMP 524: Programming Language Concepts
Björn B. Brandenburg

The University of North Carolina at Chapel Hill

**What is the purpose of the function head?
What is its type?**

It maps a list to the first element of the list.
head :: [a] -> a

What is the purpose of the function `tail`?

What is its type?

It maps a list to a version of itself with the first element removed.

`tail :: [a] -> [a]`

What is pattern matching in Haskell? What are its primary uses?

The use of a constructor on the left-hand side of an equation (definition). The definition is only used if the argument uses the same constructor (“if it matches the pattern”).

Uses:

- 1) De-structuring: extract value from a composite data type.
- 2) Guarding definitions: e.g., to provide separate definitions for an empty list and a non-empty list.

**What does ++ do?
What is its runtime complexity?**

List concatenation. Linear.

Does Haskell allow overloading?

Yes and no.

Via type classes, yes: the functions included by a type class are overloaded dependent on context.

But not for any other functions.

What's the purpose of `where` and `let ... in`?

Introduction of a new, nested scope.
They allow local definition of symbols/functions.
Nested scope: bindings from outer scopes can be shadowed.