

Implementing Recursion via State

CS 350

Dr. Joseph Eremondi

Last updated: August 3, 2024

Recursion via State

- Goals

- Goals
 - To see how to implement an interpreter for a language with recursion

- Goals
 - To see how to implement an interpreter for a language with recursion
 - To see how recursion interacts with environments and stores

- Goals
 - To see how to implement an interpreter for a language with recursion
 - To see how recursion interacts with environments and stores
- Key Concepts

- Goals
 - To see how to implement an interpreter for a language with recursion
 - To see how recursion interacts with environments and stores
- Key Concepts
 - Landin's Knot

Recursion in Curly-Rec

- When we are allowed to refer to x while defining the value that is assigned to x

Recursion in Curly-Rec

- When we are allowed to refer to `x` while defining the value that is assigned to `x`
- We'll do this with a special `let` form

Recursion in Curly-Rec

- When we are allowed to refer to `x` while defining the value that is assigned to `x`
- We'll do this with a special `let` form
 - `{letrec x <expr> <expr>}`

Recursion in Curly-Rec

- When we are allowed to refer to `x` while defining the value that is assigned to `x`
- We'll do this with a special `let` form
 - `{letrec x <expr> <expr>}`
 - Gives `{letrec x e1 e2}` gives `x` the value `e1` then evaluates `e2` with `x` in scope

Recursion in Curly-Rec

- When we are allowed to refer to `x` while defining the value that is assigned to `x`
- We'll do this with a special `let` form
 - `{letrec x <expr> <expr>}`
 - Gives `{letrec x e1 e2}` gives `x` the value `e1` then evaluates `e2` with `x` in scope
 - Exactly like `letvar`, except **`x` is also in scope in `e1`**