Lecture 13

Wednesday, November 15, 2023 08:36

Midterm

① `fun f [] = false`
`| f (x::xs) = x > ∅`

② `fun enumup n = map (fn y => x - y) (enumdown x)`

③ `t twice = t_f → t_x → t_ffx`
`t_f = t_x → t_fx`
`t_x = t_fx = t_ffx`

`t_twice = ('a → 'a) → 'a → 'a`

④ `datatype 'b bin = leaf`
`| branch of ('b * 'b bin * 'b bin)`

⑤ `'a list → 'a list`

⑥ A

⑦ `datatype E = var of string`
`| abstr of (string * E)`
`| appl of (E * E)`

⑧ `fun free V (var u) = V = u`
`| free V (abstr(u, E)) = not (V = u) and free V e`
`| free V (appl (e1, e2)) = free V e1 orelse free V e2`

⑨ No

Yes

⑪ `which 4 -> even 4 -> odd 3 -> even 2 -> odd 1 -> even ∅`