Types and Programming Languages week3

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1 Do the exercises listed at the end of Ch03c lecture notes

- See Lecture notes Ch03b

  Answer the questions in item 6 of the Evaluation Semantics section above.

  Exercise: Determine which of the following pairs are in the reduction relation for UBE. If they are in the relation, give the rule that applies. If they are not in the relation, explain why. Recall that pairs (a,b) in the reduction relation are traditionally written with arrows (a → b) instead of commas to suggest a directional computation. I didn't write them with arrows here.

  a) (true, true) ie (true → true)

     E-IfTrue

  b) (if (iszero 0) then true else false, true)

     E-IfTrue

  c) (if true then 0 else 1, 0)

     If 0 is false? and 1 true then there is an answer but I find no rule creating that relation

  d) (if true then false else true, false)

     E-IfTrue

  e) (if true then true else (if false then false else false), true)

     The inner if-elif only has one rule = false so

     E-IfTrue

  f) (if true then (if false then false else false) else true, (if true then false else true))

     E-IfTrue

  g) (if true then (if false then false else false) else true, false)

     E-IfTrue

  h) (if (if true then false else true) then true else false, ??)

     E-IfFalse

- See Lecture notes Ch03b

  For each of the following terms in UBE, list ALL the pairs in the reduction relation determined by the given term:

    a) s == if true then false else false

    b) t == if s then true else true

    c) r == if t then false else false

  s == false

  t == if false then true else true == true

  r == if true then false else false == false

- See Lecture notes Ch03b

  Give one-step derivation trees for judgements determined by the following terms. Use the definitions of the previous problem for r, s, t. Note: these terms will occur in the first component of the one-step reduction relation.

    a) The term r from the previous problem.

    b) The term w where w = if t then s else r

  I'm lost on all this

- List all pairs in the reduction relation of UBE of size 5 or less.

  there are none?

- * 9. Redo problems 1 and 2 above using the new reduction rules of problem 8.(* is extra credit). You can skip this problem now.

2 3.5.5*, 3.5.10*, 3.5.14, 3.5.18, 3.5.17*** (*** is extra credit).

3.5.5*

3.5.10*

3.5.14

3.5.18

3.5.17***