CSCE 580 Spring 2017

Quiz 4

Thursday 17-02-02

Recall the Prolog back-chaining procedure in Figure 3.12 [L]:

To establish a conjunctive query *A*1, *A*2, . . . , *An*:

1. If *n* = 0, there’s nothing to do, exit with success.
2. Otherwise, try each clause in the *program(KB)* from top to bottom in turn:
   1. Assume that the current clause has head *H* and body *B*1, . . . *Bm*, (where for atomic sentences, the body is empty and so *m* = 0).
   2. Rename all the variables in the clause.
   3. Test to see if the head *H unifies* with the first atom *A*1. If it does not, move on to the next clause.
   4. Otherwise, try to establish *B*∗1, . . . , *B*∗m, *A*∗2, . . . *A*∗n, where the ∗ means the result of replacing variables by their values from the unification.
   5. If this works, exit with success; if not, go on to the next clause.
3. If you get this far, you’ve tried all the clauses in the program. Return failure.

In order for this procedure to exit with success when the initial query is non-empty, the program (KB) must contain at least one atomic clause. True or false?

**Answer**: True. Here is why. n starts at 1 or more, since the query is nonempty. The procedure exits with success only if n = 0, so n must decrease in order for the procedure to exit with success. n is decremented only in step 2c when m = 0. Only atomic clauses have m=0.