LAB-6

Implement unification in first order logic

Algorithm : Unify(ψ_1, ψ_2)

Step 1: If ψ_1 or ψ_2 is a variable or constant, then:

    a) If ψ_1 & ψ_2 are identical, the return NIL

    b) Else if ψ_1 is a variable,

        a. then if ψ_1 occurs in ψ_2, the return FAILURE

        b. Else return {(ψ_2/ψ_1)}.

        c. Else if ψ_2 is variable

            i. if ψ_2 occurs in ψ_1 return FAILURE,

            ii. Else return {(ψ_1/ψ_2)}.

        d. Else return FAILURE

Step 2: If the initial Predicate symbol in ψ_1 and ψ_2 are not same, then return FAILURE.

Step 3: I) ψ_1 and ψ_2 have a different number of arguments, then return FAILURE.

Step 4: Set substitution set (SUBST) to NIL

Step 5: For i=1 to the number of elements in ψ_1.

    a) Call Unify function with the ith element of ψ_1 and ith element of ψ_2, and put result into S

    b) If S= failure the return FAILURE

    c) if S≠ NIL then do,

        a. Apply S to remainder of both L1 & L2

        b. SUBST: Append (S, SUBST).

Step 6: Return SUBST

Example:

$S_1 = ('p', 'x', ('t', 'x'), ('g', 'm'))$

$S_2 = ('P', 'a', 'y', ('t', 'l'))$

x : a

y : ('t', 'x')

t : g

l : m

Unified: $('p', 'x', 'y', ('t', 'l'))$