LAB-8

Forward Reasoning Algorithm

⇒

function FOL-FC-ASK (KB, α) returns false
inputs: KB, the knowledge base, a set of fo
α, the query, an atomic sentence
local variable: new, the new sentences

repeat until new is empty
new ← {}
for each rule in KB do
for each θ such that SUBST
for some $p_1, \ldots, p_n$ in KB
$q' \leftarrow$ SUBST(θ, q)
if q' does not unify with some
sentense already in KB
add q' to new
$\phi \leftarrow$ UNIFY (q', α
if φ is not fail then return

add new to KB
return false.

Output :-
Criminal (Robert) is proven!
Inferred facts:
American (Robert)
Enemy (A, America)
Owns (A, T1)
Criminal (Robert)
Missile (T1)
Weapon (T1)
Sells (Robert, T1, A)
Hostile (A)

equality.

* FOL sentences.

a) Occupation (Emily, Surgeon) ∨ Occupation (Emily, Lawyer)

b) Occupation (Joe, Actor) ∧ ∃o (Occupation (Joe, o) ∧ ≠ Actor)

c) ∀p (Occupation (p, Surgeon) → Occupation (p, Doctor))

d) ¬∃p (Occupation (p, Lawyer) ∧ Customer (Joe, p))

e) ∃p (Boss (p, Emily) ∧ Occupation (p, Lawyer))