Exercises for the Course
Logic Programming Engineering
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Practical 1

Introduction: Facts, Database Questions, Negation as Failure, Rules, Trace

Exercise 2.1
The following facts are given:

male([ali, carl, ed, frank, hugo, kurt, rene, tino, vico]).
female([berta, dora, guna, ina, jane, laura, mia, olga, wera, susan, uta]).
father(ali, [guna, hugo]).
father(carl, [ina, jane]).
father(ed, [kurt]).
father(frank, [mia, olga]).
father(hugo, [wera, rene, vico]).
father(kurt, [tino, uta]).
mother(berta, [guna, hugo]).
mother(dora, [ina, jane]).
mother(guna, [mia, olga]).
mother(ina, [wera, rene, vico]).
mother(jane, [susan]).
mother(laura, [tino, uta]).

You can get this database as a file lfamily.pl from the homepage of Logic Programming Engineering.

Define rules for

a) lparents(PL, CL) – PL is a list of parents ([Father, Mother]) and CL a list of all their children.
   Examples: ? − lparents(PL, [wera, rene, vico]). gives PL = [hugo, ina].
   ? − lparents([F, dora], CL). gives F = carl and CL = [ina, jane].

b) lbrother(B, C) - B is brother of C.
   Hint: Use the system predicate member(Elem, List).

c) lgrandpa(G, C) - G is grandpa of C.

Exercise 2.2

a) Define a predicate dellastelem(List, DList) which deletes the last element of a list.
   Example: ? − dellastelem([5, 3, 6, 2], DList) gives DList = [5, 3, 6].

b) Define a predicate scalar(Vector1, Vector2, S) which for two given vectors of integers computes their scalar product S.
   Example: ? − scalar([3, 2, 5], [5, 3, 6], S) gives S = 51.
   Hint: Use the system predicate is to assign a variable a value.

c) Define a predicate delduplelems(List, DList) which deletes the duplicate elements of a list
   beginning from the left.
   Example: ? − delduplelems([5, 3, 6, 2, 2, 3, 2, 6], DList) gives DList = [5, 3, 6, 2].