

COL226: PROGRAMMING LANGUAGES

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ASSIGNMENT 6

ALGORITHM:

x(mm).

x(ms).

y(ms,v).

y(mm,p).

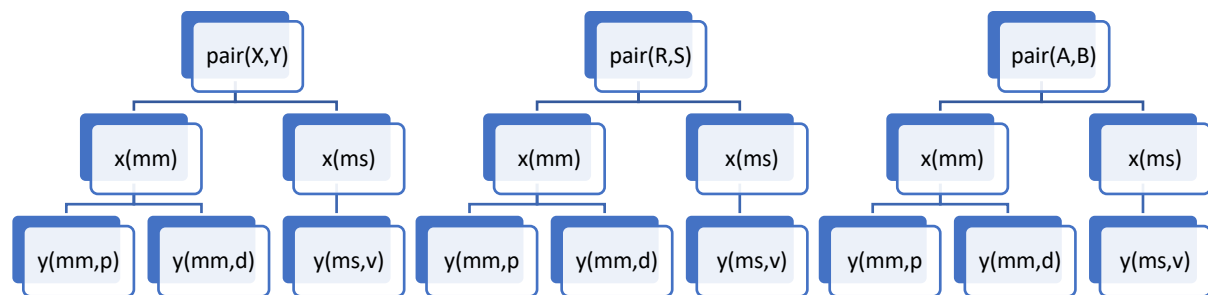
y(mm,d).

pair(X,Y): x(X), y(X,Y).

pair(R,S): x(R), y(R,S).

pair(A,B): x(A), y(A,B).

Suppose for this database if we have to process the goal- **pair(M,N)**. then given below is the mathematical approach that will be followed.



This is a depth first search approach where we stop when we find a substitution for the variables in the goal. A goal is replaced by sub-goals on which it is conditioned. These sub-goals are then pushed on the stack which is used to pop a goal to search for a unification. If it unifies then the cycle to replace the goal with its sub-goals and push these on the stack is repeated. It ends when the stack is empty returning the substitution obtained so far. This is the leaf of the tree. It branches when the goal is unifiable with multiple head in database.

FOLDER STRUCTURE:

This folder contains in total 7 files mentioned below-

1. structure.ml- It defines the type/data structure used for database.
2. lexer.mll- regular expression for tokens used in prolog database is defined here.
3. parser.mly- grammar of the language is defined here.
4. assignment6.ml- backend functions are defined here. It reads the prolog file containing database and create a table whose type is database defined in structure.ml. Also it reads the query/goal given by user on console and interprets it and calls appropriate functions to process the given query to produce a substitution.
5. Makefile- It compiles above four files, creates assignment6 executable, runs the executable and finally remove the executable along with other object files.
6. Input.pl- This is a prolog file containing database.
7. README.pdf- This file is provided to briefly describe my prolog implementation.

PROLOG SYNTAX:

1. Head and body are separated by colon ":"
2. Every clause has a ending full stop "."
3. A head is a single atomic formula.
4. A body is a sequence of atomic formulas separated by comma ","
5. An atomic formula is a k-ary predicate symbol followed by k terms separated by comma "," and enclosed in parenthesis "(" ")"
6. A term is either a variable, a constant, or a k-ary function symbol with k sub-terms separated by comma "," and enclosed in parenthesis "(" ")"
7. A goal is a single atomic formula.

HOW TO RUN:

1. Open terminal (make sure you have Ocaml interpreter installed on your pc)
2. Change your directory to Assignment6
3. run "make" command
4. Use ";" to search for another possible substitution and "." for terminating search.
5. To get out of prolog interpreter use "exit." Command