## Assignment 6

1. Write a program in Prolog that uses following predicates

Write, nl, read, consult,halt,statistics.

1. Try to answer the following questions first “by hand” and then verify your answers using a Prolog interpreter.

(a) Which of the following are valid Prolog atoms?

f, loves(john,mary), Mary, \_c1, 'Hello', this\_is\_it

(b) Which of the following are valid names for Prolog variables?

a, A, Paul, 'Hello', a\_123, \_, \_abc, x2

(c) What would a Prolog interpreter reply given the following query?

?- f(a, b) = f(X, Y).

(d) Would the following query succeed?

?- loves(mary, john) = loves(John, Mary).

Why?

(e) Assume a program consisting only of the fact

a(B, B).

has been consulted by Prolog. How will the system react to the following query? ?- a(1, X), a(X, Y), a(Y, Z), a(Z, 100).

Why?

1. Read the section on matching again and try to understand what's happening when you submit the following queries to Prolog.

(a) ?- myFunctor(1, 2) = X, X = myFunctor(Y, Y).

(b) ?- f(a, \_, c, d) = f(a, X, Y, \_).

(c) ?- write('One '), X = write('Two ').

1. Draw the family tree corresponding to the following Prolog program:female(mary).

female(sandra).

female(juliet).

female(lisa).

male(peter).

male(paul).

male(dick).

male(bob).

male(harry).

parent(bob, lisa).

parent(bob, paul).

parent(bob, mary).

parent(juliet, lisa).

parent(juliet, paul).

parent(juliet, mary).

parent(peter, harry).

parent(lisa, harry).

parent(mary, dick).

parent(mary, sandra).

After having copied the given program, define new predicates (in terms of rules using male/1, female/1 and parent/2) for the following family relations:

(a) father

(b) sister

(c) grandmother

(d) cousin

You may want to use the operator \=, which is the opposite of =. A goal like X \= Y succeeds, if the two terms X and Y cannot be matched.

Example: X is the brother of Y, if they have a parent Z in common and if X is male and if X and Y don't represent the same person. In Prolog this can be expressed through the following rule:

brother(X, Y) :-

parent(Z, X),

parent(Z, Y),

male(X),

X \= Y.