Comp 333 Test Cases for Project 4 submission

***Directions: Submit the runtime results of your test cases by doing a copy-paste of the Prolog interpreter results. Past the results into a WORD or similar document and print.***

**Problem 1.** Test family tree predicates with your family tree. Every student should turn in an individual document.

Substitute your own name for **adam**, your mother’s name for **linda** and your father’s name for **bill**. **Find all possible solutions for the unknowns.**

mother(linda,adam).

parent(X,adam).

grandparent(Z, linda).

grandmother(W, bill).

sister(A,adam).

brother(B,bill).

ancestor(X,adam),

relatives(bill, Y).

descendant(linda,Y).

father(X,bill), brother(X,Y).

aunt(Y,adam).

firstCousin(A,adam).

firstCousin(adam,B).

grandfather(A,adam), descendant(A,Y).

**Problem 2**. Test the following expressions rewritten as lists of atoms with quotes around parentheses.

1. ( x + y) \* ( 3\* u – 2)
2. 12 \* ( 3 / ( 4 \* 56) ) + 120 - 200
3. ( ( 2\*x + 5 y + **-9** ) ) //enter the **-9** as a number
4. 3 + 6 + ( 5 – 6 ) 8
5. 40 \* ( A + B )
6. ( 12345 )

**Problem 3: Find all possible solutions for the unknowns.**

1. subseqSum([ 2, 3, 5,4,6, 9 , 1] , 9, X).
2. subseqSum( [ 7,5,1,22,6,12,9,10,3], 20, X).
3. between( 10,12,M), subseqSum([3,4,5,6,7], M, Z).
4. bagof(Z, subseqSum([3,6,5,7,8,3,5,9], 15,Z), L), length(L,N). //See Getting Started in Prolog FAQ
5. subseqSum( [2,3,5], A,B). Explain answer in detail.

**Problem 4.** **Find all possible solutions for the unknowns.**

1. fsm(0, [b,b,a,b,b,a,b]). (true)
2. fsm(0, [a,b,a,b,a,b,b,a,b,b,a]). (true)
3. fsm(0,[b,b,b,b,b,a,a,b]). (false)
4. fsm(X, [b,b,a,a,b]). Explain answer (x =1 , 2 , 3)
5. fsm(3, [a,b,a,b]). (true)
6. fsm(0, [X1,X2,X3,X4]). Explain answer
7. fsm(0, [a,b,b,c,a]). (false)

PROBLEM 3 Answers

11 ?- subseqsum([2,3,5,4,6,9,1],9,X).

X = [2, 3, 4] ;

X = [2, 6, 1] ;

X = [3, 5, 1] ;

X = [3, 6] ;

X = [5, 4] ;

X = [9] ;

13 ?- subseqsum([7,5,1,22,6,121,9,10,3], 20, X).

X = [7, 1, 9, 3] ;

X = [7, 10, 3] ;

X = [5, 6, 9] ;

X = [1, 6, 10, 3] ;

X = [1, 9, 10] ;

14 ?- between(10,12,M), subseqsum([3,4,5,6,7],M,Z).

M = 10,

Z = [3, 7] ;

M = 10,

Z = [4, 6] ;

M = 11,

Z = [4, 7] ;

M = 11,

Z = [5, 6] ;

M = 12,

Z = [3, 4, 5] ;

M = 12,

Z = [5, 7] ;

16 ?- bagof(Z, subseqsum([3,6,5,7,8,3,5,9],15,Z),L),length(L,N).

L = [[3, 5, 7], [3, 7, 5], [3, 3, 9], [6, 9], [5, 7, 3], [7, 8], [7, 3|...]],

N = 7

17 ?- subseqsum([2,3,5],A,B).

A = 10,

B = [2, 3, 5] ;

A = 5,

B = [2, 3] ;

A = 7,

B = [2, 5] ;

A = 2,

B = [2] ;

A = 8,

B = [3, 5] ;

A = 3,

B = [3] ;

A = 5,

B = [5] ;

A = 0,

B = [].

Problem 2

18 ?-

| e(['(',x,+,y,')',\*,'(',3,\*,u,-,2,')']).

true ;

19 ?- e([12, \*, '(',3,/,'(',4,\*,56,')',')',+,120,-,200]).

true ;

true ;

20 ?- e(['(','(',2,\*,x,+,5,y,+,-9,')',')']).

false.

21 ?- e([3,+,6,+,'(',5,-,6,')',8]).

false.

22 ?- e([40,\*,'(',A,+,B,')']).

A = B, B = a ;

A = a,

B = b ;

A = a,

B = c ;

A = a,

B = d ;

.

.

.

.

23 ?- e(['(',12345,')']).

true ;