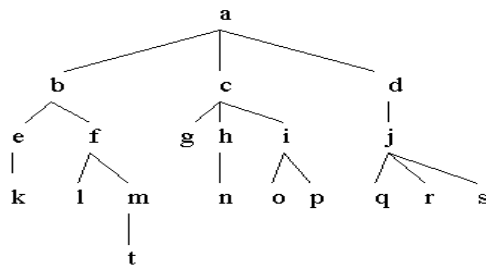


Implementation of Tree Data Structure



Predicates

is_parent(symbol,symbol)

sibling(symbol,symbol)

leaf_node(symbol)

is_at_same_level(symbol,symbol)

locate(symbol)

nondeterm path (symbol)

Clauses

is_parent(a,b).

is_parent(a,c).

is_parent(a,d).

is_parent(b,e).

is_parent(b,f).

is_parent(c,g).

is_parent(c,h).

is_parent(c,i).

is_parent(d,j).

is_parent(e,k).

is_parent(f,l).

is_parent(f,m).

is_parent(h,n).

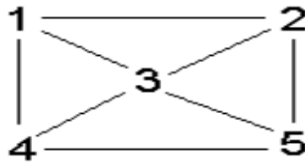
is_parent(i,o).

```

is_parent(i,p).
is_parent(j,q).
is_parent(j,r).
is_parent(j,s).
is_parent(m,t).
is_parent(n,u).
is_parent(n,v).
sibling(X,Y):- is_parent (Z,X),
               is_parent(Z,Y),
               X<>Y.
is_at_same_level (X,X).
is_at_same_level(X,Y):- is_parent (W,X),
                       is_Parent (Z,Y),
                       is_at_same_level(W,Z).
/* Locate node by finding a path from root down to the node. */
locate(Node) :- path(Node),
               write(Node), nl.
path(a).          /* Can start at a.    */
path(Node) :- is_parent(Mother,Node), /* Choose parent,    */
              path(Mother),          /* find path and then */
              write(Mother).
leaf_Node(Node) :- not(is_parent(Node,child)).
goal
%is_parent(a,b).
%sibling(b,c).
%is_at_same_level(m,v).
%leaf_node(b).
path (p).

```

Write a Prolog program to find whether the node of the following graph is connected or not.



Predicates

edge(integer,integer)

nondeterm connected(integer,integer)

Clauses

edge(1,2).

edge(1,4).

edge(1,3).

edge(2,3).

edge(2,5).

edge(3,4).

edge(3,5).

edge(4,5).

connected(X,Y) :- edge(X,Y) ; edge(Y,X).

Goal

connected(2,4).

Highway Map modeling and recursive rules

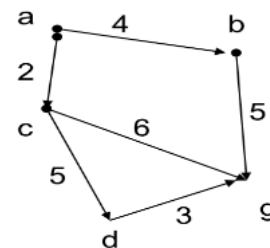
- To represent the shown map we use the predicate

link (node, node, distance)

- To find a path from s to d
 - get it from mentioned facts :
path (S,D, TDist):-link (S, D, TDist).
 - Or find a node x which has a link from S to X and a path from X to D as follows:

path (S,D, TDist):-

**link (S,X,DS1),path (X,D,DS2),
TDist=DS1+DS2.**



link(a,b,4).
link (a,c,2).
link (b,g,5).
link (c ,g,6).
link (c,d,5).
link (d,g,3).

DOMAINS

node=symbol

distance= integer

PREDICATES

nondeterm link (node, node, distance)

nondeterm path (node, node, distance)

CLAUSES

link(a,b,4).

link (a,c,2).

link (b,g,5).

link (c ,g,6).

link (c,d,5).

link (d,g,3).

path (S,D, TDist):-link (S, D, TDist).

path (S,D, TDist):-

link (S, X, TD1),path (X,D,TD2), TDist=TD1+TD2.

GOAL

path (a, g, TotalDistance).

The complete path distance finder program

Facts that model the
road map

Recursive
rule

output

TotalDistance=9
TotalDistance=8
TotalDistance=10
3 Solutions