Artificial Intelligence (CSE643)

ASSIGNMENT-2

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Working Of Program-

First user have to select search method.

Then enter source and destination.

Finally it will show path according to selected search method

Code-

Main.pl

```
:- [library(csv)].
:- dynamic allvalues/3.

start:-
    reconsult('C:/Users/user/Downloads/Road-route-from-one-city-to-another-in-prolog-main/Road-route-from-one-city-to-anothe
r-in-prolog-main/dfs.pl'),nl,
    reconsult('C:/Users/user/Downloads/Road-route-from-one-city-to-another-in-prolog-main/Road-route-from-one-city-to-anothe
r-in-prolog-main/bfs.pl'),nl,retractall(goal(_)), retractall(val(_)),retractall(vals(_)), retractall(saved(_,_,_)), retracta
ll(allvalues(_,_,_)), main(T).

main(T):-
        write('Welcome To Route System'),nl,
    write('Select search you want to use to find the route from one city to another city?'),nl,
    write('1. Depth First Search'),tab(4),
    write('2. Best First Search'),nl,
    read(T),
     readcsvfile(CSV),
    algo(T).


algo(Type):-
        Type = 2, readcsvfile1(CSV), !, input(S), bfs(S, P), path(P).

algo(Type):-
        Type = 1, !,input(S), dfs(S, P), path(P).

input(S):-
        write('Enter Source: '),
        read(S), nl,
        write('Enter Destination: '),
        read(G), nl,
        assert(goal(G)).
path([]).
path([H|T]):- writeln(H), path(T).
```

Dfs.pl

```
:- dynamic val/1.

readcsvfile(CSV) :-
    ( nonvar(CSV) ; CSV = 'C:/Users/user/AI/Assignment2/roaddistance.csv'),forall(readvalue(CSV, R), savevalue(R)).
readvalue(CSV, R) :-
    csv_read_file_row(CSV, R,[]).

dfs(SO, P):-
        dfsutil(SO,[SO],PS), reverse(PS,P).
dfsutil(S,P1,P1) :- goal(S).
dfsutil(S,End,P) :- (allvalues(S,S1,_); allvalues(S1,S,_)),not(member(S1,End)), dfsutil(S1,[S1|End], P).
savevalue(R) :-
    val(Col), R =.. [_|C], C = [K|Val], findall(X, val(X),Z), savecol(K, Z, Val).
savevalue(R):-
    R =.. [_|C], remain(C,Cs), facts(Cs).
savecol(_,[],[]).
savecol(R, [Cc|TT], [Val|T]) :- assert(allvalues(R, Cc, Val)),savecol(R,TT, T).
facts([]).
facts([H|T]):- assert(val(H)),facts(T).
remain([], []).
remain([X|Xs], [X|Remain]) :-
    remain(Xs,Remain).
```

Bfs.pl

```
:- dynamic saved/3.
:- dynamic vals/1.

readcsvfile1(CSV) :-
        ( nonvar(CSV) ; CSV = 'C:/Users/user/AI/Assignment2/heurestic.csv'), forall(readvalue(CSV, R), savevaluebfs(R)).
bfs(S, P):-
     bfsutil(S,[[9999,x]],[S],Pt), reverse(Pt,P).
bfsutil(S,Tf,P,P) :- goal(S).
bfsutil(S,Tf,End,P) :-
     goal(G), findall([Y,X],((allvalues(S,X,_); allvalues(X,S,_)),saved(X,G,Y), not(member(X, End))),Z), append(Z,T1,FinalAns)
,
     sort(1,@<,FinalAns,[H|T]), nth1(2,H, H1), bfsutil(H1,T,[H1|End],P).

savevaluebfs(R) :-
    vals(Col), R =.. [_|Cols], Cols = [R|All], findall(X, vals(X),Z), savecol(R, Z, All).
savevaluebfs(R):-
    R =.. [_|C], remain(C,Co), factsbfs(C).
savecol(_,[],[]).
savecol(R, [C|Tail], [All|T]) :-
    assert(saved(R, Col, All)),savecol(R,Tail, T).
factsbfs([]).
factsbfs([H|T]):-
    assert(vals(H)),factsbfs(T).
```

Snapshots-

Using Best First Search-

```
% c:/users/user/downloads/road-route-from-one-city-to-another-in-prolog-mai
, 0 clauses
?- start.

Welcome To Route System
Select search you want to use to find the route from one city to another city?
1. Depth First Search    2. Best First Search
|: 2.
Enter Source: |: delhi.

Enter Destination: |: gwalior.

delhi
gwalior
true .

?-
```

Using Depth First Search-

```
enter source|: delhi.

enter goal|: gwalior.

delhi
ahmedabad
bangalore
bhubaneshwar
bombay
calcutta
chandigarh
cochin
hyderabad
indore
jaipur
kanpur
lucknow
madras
nagpur
nasik
panjim
patna
pondicherry
pune

gwalior
true .
```