CSA-1704 AI FOR LLM

PROGRAM 27

% --- Facts: edge(Node1, Node2, Cost) ---

edge(a, b, 1).

edge(a, c, 3).

edge(b, d, 1).

edge(c, d, 1).

edge(c, e, 5).

edge(d, f, 2).

edge(e, f, 1).

% --- Heuristic: h(Node, HeuristicCostToGoal) ---

h(a, 5).

h(b, 4).

h(c, 2).

h(d, 1).

h(e, 3).

h(f, 0).

% --- Best-First Search ---

best\_first(Start, Goal, Path) :-

h(Start, H),

bfs([[Start, H]], Goal, [], PathRev),

reverse(PathRev, Path).

% bfs(OpenList, Goal, Visited, Path)

bfs([[Goal, \_]|\_], Goal, \_, [Goal]).

bfs(OpenList, Goal, Visited, Path) :-

% Choose node with lowest heuristic

select([Node, \_], OpenList, RestOpen),

\+ member(Node, Visited),

findall([Next, Hn],

(edge(Node, Next, \_), h(Next, Hn), \+ member(Next, Visited)),

Children),

append(RestOpen, Children, NewOpen),

sort(2, @=<, NewOpen, SortedOpen), % sort by heuristic

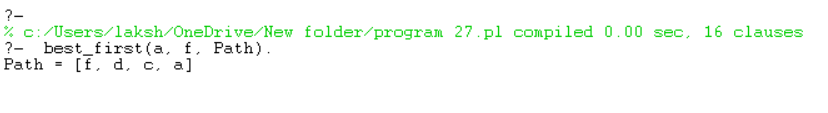
bfs(SortedOpen, Goal, [Node|Visited], SubPath),

Path = [Node|SubPath].

Queries:

?- best\_first(a, f, Path).

Output:

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