Artificial Intelligence Lab
CS 308
Assignment 3

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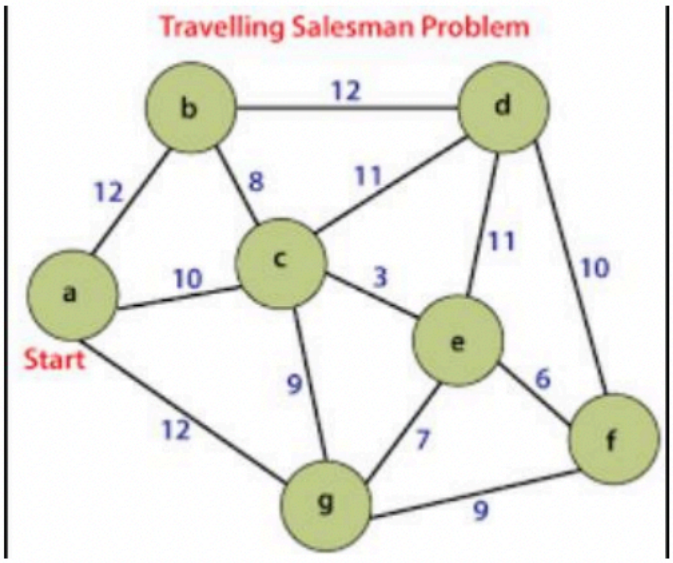
Q1). 1. Implement Traveling Salesman problem in prolog.
The travelling salesman problem is a graph computational problem where the salesman needs
to visit all cities (represented using nodes in a graph) in a list just once and the distances
(represented using edges in the graph) between all these cities are known. The solution that is
needed to be found for this problem is the shortest possible route in which the salesman visits
all the cities and returns to the origin city.



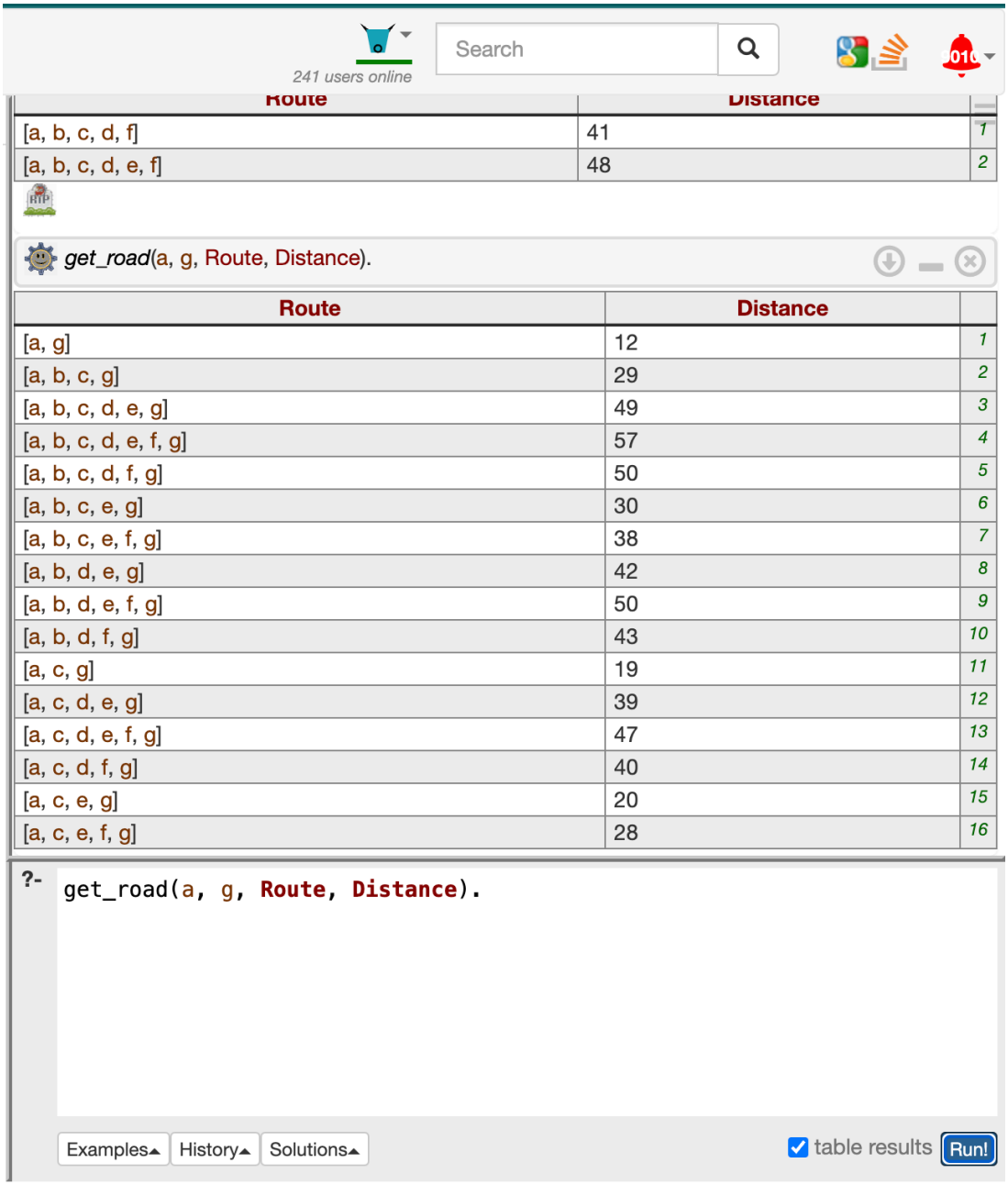
Ans:-

```
road(a,b,12).
road(a,c,10).
road(a,g,12).
road(b,c,8).
road(b,d,12).
road(c,d,11).
road(c,e,3).
road(c,g,9).
road(d,e,11).
road(d,f,10).
road(e,f,6).
road(e,g,7).
road(f,g,9).

get_road(Start, End, Visited, Result):-
    get_road(Start, End, [Start], 0, Visited, Result).

get_road(Start, End, Waypoints, DistanceAcc, Visited, TotalDistance):-
    road(Start, End, Distance),
    reverse([End|Waypoints], Visited),
    TotalDistance is DistanceAcc + Distance.

get_road(Start, End, Waypoints, DistanceAcc, Visited, TotalDistance):-
    road(Start, Waypoint, Distance),
    \+ member(Waypoint, Waypoints),
    NewDistance is DistanceAcc + Distance,
    get_road(Waypoint, End, [Waypoint|Waypoints], NewDistance, Visited, TotalDistance).
```


241 users online
Search
Route
Distance
[a, b, c, d, f]
41
1
[a, b, c, d, e, f]
48
2
get_road(a, g, Route, Distance).
Route
Distance
[a, g]
12
1
[a, b, c, g]
29
2
[a, b, c, d, e, g]
49
3
[a, b, c, d, e, f, g]
57
4
[a, b, c, d, f, g]
50
5
[a, b, c, e, g]
30
6
[a, b, c, e, f, g]
38
7
[a, b, d, e, g]
42
8
[a, b, d, e, f, g]
50
9
[a, b, d, f, g]
43
10
[a, c, g]
19
11
[a, c, d, e, g]
39
12
[a, c, d, e, f, g]
47
13
[a, c, d, f, g]
40
14
[a, c, e, g]
20
15
[a, c, e, f, g]
28
16
?-
get_road(a, g, Route, Distance).
Examples
History
Solutions
table results
Run!