Department of Computer Engineering

Academic Term II : 22-23

Class: B.E (Comp A), SemVI **Subject Name: Artificial Intelligence**

Student Name: Gouri Tushar Sankhe **Roll No: 9230**

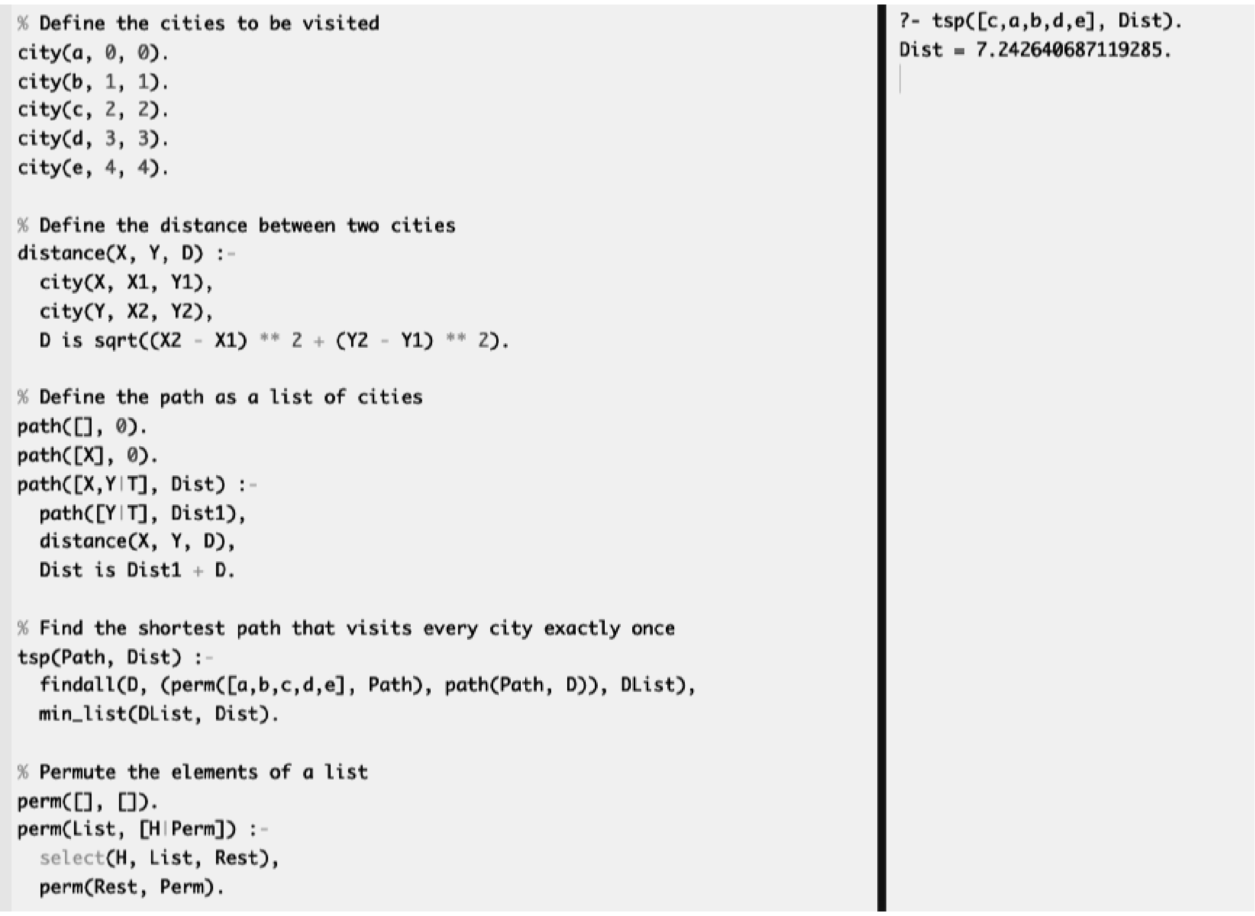
Practical No:	**7**
Title:	**Write any One program : Traveling Salesman problem Prolog Programing (Knowledge Engineering- Advance)**
Date of Performance:	**20 -03- 2023**
Date of Submission:	**3 -04- 2023**

Rubrics for Evaluation:

Sr. No	**Performance Indicator**	**Excellent**	**Good**	**Below Average**	**Marks**
1	On time Completion & Submission (01)	01 (On Time)	NA	00 (Not on Time)	
2	Logic/Algorithm Complexity analysis(03)	03(Correct)	02(Partial)	01 (Tried)	
3	Coding Standards (03): Comments/indention/Naming conventions Test Cases /Output	03(All used)	02 (Partial)	01 (rarely followed)	
4	Post Lab Assignment (03)	03(done well)	2 (Partially Correct)	1(submitted)	
Total					

Signature of the Teacher :

The Travelling Salesman Problem (TSP)



```
% Define the cities to be visited
city(a, 0, 0).
city(b, 1, 1).
city(c, 2, 2).
city(d, 3, 3).
city(e, 4, 4).

% Define the distance between two cities
distance(X, Y, D) :-
  city(X, X1, Y1),
  city(Y, X2, Y2),
  D is sqrt((X2 - X1) ** 2 + (Y2 - Y1) ** 2).

% Define the path as a list of cities
path([], 0).
path([X], 0).
path([X,Y|T], Dist) :-
  path([Y|T], Dist1),
  distance(X, Y, D),
  Dist is Dist1 + D.

% Find the shortest path that visits every city exactly once
tsp(Path, Dist) :-
  findall(D, (perm([a,b,c,d,e], Path), path(Path, D)), DList),
  min_list(DList, Dist).

% Permute the elements of a list
perm([], []).
perm(List, [H|Perm]) :-
  select(H, List, Rest),
  perm(Rest, Perm).
```

```
?- tsp([c,a,b,d,e], Dist).
Dist = 7.242640687119285.
```

CONCLUSION:

The tsp predicate is used to find the shortest path that visits every city exactly once. The predicate takes two arguments: Path, which will be bound to the shortest path found, and Dist, which will be bound to the length of the shortest path.

This output indicates that the shortest path that visits every city exactly once, starting from c and going to a -> b -> d -> e -> c, has a length of approximately 7.24 units.