**Artificial and Computational Intelligence**

**Assignment 1**

**Path Finding Agent**

**Problem Statement**

Assume that you are the head of the corporation team that clears the roads in a city like Chennai for traffic. It is the time of the year with cyclones causing trees to fall. It is your duty to clear the roads for traffic.

The problem here is defined as to find the shortest route that travels through all the roads in an area clearing them. The shortest path includes all the roads but only once. Help your cleaning robot in finding such a path given a starting point and the map.

Here the area map is represented as a graph. The algorithm takes the starting point and the graph as the input and produces the shortest path covering all the edges only once.

**Kotturpuram**

**Anna Nagar**

**T. Nagar**

**Central Station**

**Guindy**

**Tambaram**

Note: Vertices can be travelled more than once.

1. Explain the environment of the agent [20% weightage]
2. First calculate the degree of the vertices and check if Euler path exists in the graph. If it exists then find the path. [20% weightage]
3. Use appropriate data structures and implement search algorithms (BFS and DFS) to find the path that covers all the roads from different areas in Chennai as provided in the graph. [40% weightage]
4. Compare BFS and DFS using your implementation in terms of space and time complexity. [20% weightage]
5. The starting point is to be obtained from the user as input

NOTE:

* You are provided with the python notebook template which stipulates the structure of code and documentation. You are free to add as many code cells as possible. Use well intended python code.
* The implementation code must be completely original.
* Please keep your work (code, documentation) confidential. If your code is found to be plagiarized, you will be penalized severely. Parties involved in the copy will be considered equal partners and will be penalized severely.