Title: Search Algorithms - Shortest Path Between Two Algerian Cities

Academic Year: 2022/2023

Discipline: Computer Science

Assignment: Search Algorithms - Shortest Path Between Two Algerian Cities

Goal:

- Write a program to find the shortest path between two cities in Algeria using search algorithms.
- Visualize this path on a map.

Steps:

1. **Data Acquisition:**
    - Download Algerian map data from OpenStreetMap https://www.openstreetmap.org/
    - Choose a format like .osm or .xml.
2. **Graph Representation:**
    - Use the Python library OSMnx to convert the map data into a graph.
        - Nodes: Intersections or landmarks
        - Edges: Roads connecting the nodes
3. **Shortest Path Algorithm:**
    - Implement the A* search algorithm in Python.
    - Libraries like NetworkX can help with graph operations.
4. **Visualization:**
    - Use matplotlib to:
        - Display the Algerian map.
        - Highlight the calculated shortest path in a distinct color.
5. **Testing:**
    - Test your program with various city pairs within Algeria.
    - Evaluate the program's performance and discuss any challenges you faced.

Bonus:

- Add an interactive element! Let the user click on the map to select their starting and destination cities.

Let me know if you'd like more help with:

- Specific code examples
- Alternative search algorithms
- Tips on using OSMnx and NetworkX