

CSC-200L Data Structures and Algorithm
Project Proposal

Smart City Management System



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Problem Statement:

Managing urban infrastructure efficiently is challenging in rapidly growing cities. Administrators often face difficulties in maintaining stops, managing road connectivity, and addressing citizen complaints. Citizens, on the other hand, struggle with finding optimal routes and communicating issues effectively. A centralized, console-based solution is essential to make city management more efficient and accessible. It helps administrators and citizens work together more easily, improving communication and making everyday tasks simpler. This system solves key problems and ensures everything runs smoothly for everyone.

Significance of the Project

The **Smart City Management System** is a console-based application designed to streamline city management processes. By leveraging a simple and user-friendly interface, it empowers administrators to manage stops, roads, citizens, and complaints effectively while providing citizens with tools to find routes and register complaints. This project ensures accessibility and functionality in environments where graphical interfaces may not be feasible.

Relevance of the Proposed System

Functionalities :

1. Admin Operations:

- **Manage Stops:** Add, or delete transportation stops to maintain up-to-date routing information.
- **Manage Roads Between Stops:** Modify road connections to reflect real-world changes and optimize travel routes.
- **Manage Citizens:** Keep citizen records updated, with an **undo feature** to reverse the last action for error handling.
- **Manage Complaints:** View and resolve complaints efficiently using a categorized console interface.

2. User Operations:

- **Find Shortest Path:** Leverage algorithms like Dijkstra's to determine the shortest route between two stops.
- **Submit Complaints:** Enable citizens to log complaints, ensuring their voices are heard by the authorities.

3. Authentication:

- Both admins and users authenticate themselves with credentials to ensure secure access to respective functionalities.