

# DEPARTMENT OF COMPUTER SCIENCE

## Data Structures and Algorithms

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### Project Overview:

The "Travel Planner and Journey Guide" CLI application is designed to simplify the process of planning and booking travel. Users can create accounts, explore travel options, and book tickets between their desired source and destination. By integrating the Bellman-Ford algorithm, the application calculates the shortest path, ensuring users receive the most efficient travel routes. Additionally, the system keeps a detailed history of user bookings, offering a convenient way to track and manage travel plans.

### Implementation Strategy:

- Develop a user-friendly "Travel Planner and Journey Guide" CLI application.
- Allow users to create and manage personal accounts for a personalized experience.
- Enable ticket booking functionality for journeys between selected source and destination locations.
- Implement the Bellman-Ford algorithm to calculate the shortest path, optimizing travel routes for efficiency.
- Incorporate a ticket history feature to store and display past bookings for easy access and management.
- Design a streamlined interface that integrates these features to enhance usability and convenience.

### Key Data Structures:

- Arrays
- Bellman-Ford Algorithm
- Floyd-Warshall Algorithm
- Graph

### Language / Tools:

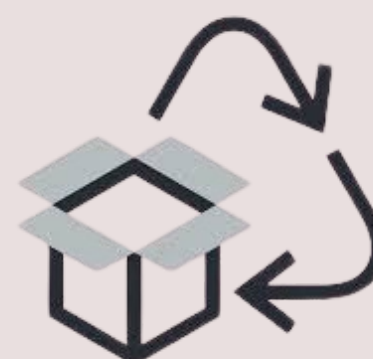
The project was implemented using C++ as the primary programming language, leveraging its robust features for algorithm implementation and data handling. File handling was utilized to manage user data, ticket history, and travel records, ensuring data persistence and easy retrieval. The development was carried out in Visual Studio Code (VS Code), which provided an efficient and user-friendly environment for coding and debugging.

### System Attributes:



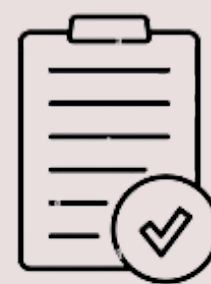
#### Accuracy:

The Bellman-Ford algorithm guarantees accurate results for the shortest path calculations, even in complex graphs with negative edge weights.



#### Resource Utilization:

The implementation in C++ ensures efficient memory and CPU usage, allowing the application to run smoothly on various systems with minimal resource consumption.



#### Reliability:

The combination of C++'s strong typing and file handling ensures data integrity and reduces the likelihood of errors or data loss.

### Project Outcomes:

- Developed a functional travel planning application.
- Enabled account creation, ticket booking, and travel history management.
- Implemented Bellman-Ford algorithm for accurate shortest path calculation.
- Ensured data persistence with file handling.
- Delivered a user-friendly and efficient system.

### Future Extensions:

- Future Advancements:
- Real-time traffic integration.
- GUI development for better usability.
- Secure online payment support.
- Database implementation for scalability.
- Multi-language functionality.

### Group Members:

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