

Project Proposal: Flight Data Analysis Tool

1. Introduction:

The Flight Data Analysis Tool aims to provide a comprehensive platform for analyzing flight data using graph algorithms. This project will enable users to import flight data from CSV files, create a graph representing flights between airports, and perform various graph algorithms to gain insights into the air transportation network. The tool will be implemented in Java, leveraging the JGraphT library for graph representation and algorithm implementation.

2. Objectives:

- Develop a Java-based application for analyzing flight data using graph algorithms.
- Implement functionality to import flight data from CSV files and create a graph representing flights between airports.
- Provide command-line interface (CLI) for performing graph algorithms such as Dijkstra's algorithm, Prim's algorithm, and BFS.
- Enable users to visualize the flight graph and algorithmic results for better understanding and analysis.
- Ensure scalability and efficiency in handling large datasets of flight data.

3. Scope:

The project will focus on the following key components:

- CSV Data Import: Allow users to import flight data from CSV files containing information such as origin, destination, flight number, departure time, and arrival time.
- Graph Creation: Create a directed weighted graph representing flights between airports, with airports as vertices and flights as weighted edges.
- Algorithm Implementation: Implement common graph algorithms such as Dijkstra's algorithm for shortest path finding, Prim's algorithm for minimum spanning tree, and BFS for connectivity analysis.
- Command-line Interface: Design an intuitive CLI for users to interact with the flight graph, perform algorithmic tasks, and visualize results.
- Documentation: Provide comprehensive documentation covering installation instructions, usage guide, and developer guide.

4. Deliverables:

The project deliverables will include:

- Flight Data Analysis Tool application with core functionality implemented.
- Documentation covering installation instructions, usage guide, and development details.
- Source code repository hosted on GitHub or a similar platform.

5. Conclusion:

The Flight Data Analysis Tool aims to provide a valuable resource for analyzing flight data using graph algorithms, offering insights into route optimization, network efficiency, and connectivity analysis. By leveraging modern software development practices and graph theory principles, the project seeks to deliver a robust and user-friendly tool for flight data analysis and visualization.