





Graphic Era
Hill University
 DEHRADUN • BHIMTAL • HALDWANI

PROJECT AND TEAM INFORMATION

Project Title

Optifly : Optimizing Airline Route for passenger's efficiency and cost Saving.

Student/Team Information

Team Name: Tech Resolutions Team Mentor: Miss. Swati Joshi	
Team member 1 (Team Lead) Abhay Kanojia student ID: 230115137 email: abhaykanojia51@gmail.com	
Team member 2 Anvesha student ID: 230122228 email: dipirawat830@gmail.com	

Team member 3

Tanmay Chauhan

student ID: 23011566

email: chauhantanmay253@gmail.com



PROJECT PROGRESS DESCRIPTION

Project Abstract

OptiFly is an intelligent airline route optimization system designed to compute the most efficient routes between cities based on various factors like cost, travel time, and layovers. The system addresses inefficiencies in current route-finding methods by creating a graph-based backend coupled with efficient shortest-path algorithms. It offers personalized route suggestions via a user-friendly interface and enables administrators to manage flight data dynamically.

Updated Project Approach and Architecture

(Describe your current approach, including system design, communication protocols, libraries used, etc. Max 300 words).

Our project uses a **modular architecture**. The backend is developed in Java, managing data using local databases and representing flights and airports as a directed weighted graph. Pathfinding is handled using Dijkstra's and Bellman-Ford algorithms.

Java libraries used: java.sql, java.util, java.time, java.json, java-servlet

Two frontend pages developed using HTML, CSS, and JavaScript:

- **Client page:** Source, destination, and priority (time, cost, or both) input
- **Admin page:** Add, update, and suspend flights
- **connecting frontend to Java backend** via java Servlet server.

Tasks Completed

Task Completed	Team Member
1. Server-side backend (airport data, flight management terminal, Conversion of airports into codes for ease in construction of graph), Frontend connection with backend .	❖ Abhay Kanojia
2. Client-side backend (graph setup, pathfinding)	❖ Tanmay Chauhan
3. Frontend pages (client and admin interfaces)	❖ Anvesha Rawat

Challenges/Roadblocks

(Describe the challenges that you have faced or are facing so far and how you plan to solve them. Max 300 words).

1. **Language Switch & Integration:** Integrating c++ backend with web frontend posed difficulties due to language differences and lack of native support for direct interaction, that's why switch to java.
2. **Airport Data Compilation:** Sourcing and assigning reliable, structured codes to Indian airports required significant manual work.
3. **Library Limitations:** Java's limited web integration libraries made linking frontend and backend more complex.
4. **Planned Resolutions:** Use of java Servlet for frontend-backend connections.
5. **Lack of Real-time data:** Due to safety reasons no company is providing the future data of a flight which was the main component of the project.

Tasks Pending

(Describe the main tasks that you still need to complete. Max 250 words).

Task Pending	Team Member (to complete the task)
All commitments are made successfully by the team members.	

Project Outcome/Deliverables

(Describe what are the key outcomes / deliverables of the project. Max 200 words).

1. **Route optimization software identifying optimal flights based on multiple criteria:** The project aims to deliver a comprehensive **route optimization software** capable of identifying the most efficient flight routes between two cities based on multiple user-defined criteria such as travel cost and flight duration. This will empower travelers to make better-informed decisions suited to their preferences.
2. **Graph-based backend with real-time flight management:** A graph-based backend system has been implemented, where airports are represented as nodes and flights as edges within a directed weighted graph. This structure allows for efficient management of flight connections and enables future integration of shortest path algorithms for route optimization.
3. **User-friendly client and admin web interfaces:** The system also features **user-friendly web interfaces** for both clients and administrators. The client interface allows travelers to input their preferences and view flight details, while the admin interface provides tools to add, update, or suspend flights within the system database in real time.

Progress Overview

1. The **backend logic for flight management** has been successfully developed. This includes creating a directed graph data structure representing airports and their connecting flights, alongside a functional server-side terminal that allows the administrator to add, update, and suspend flight details dynamically within the system's local database.
2. On the **frontend side**, two fully functional web pages have been created — one for clients to enter travel preferences such as source, destination, and priority criteria (time, cost, or both), and another for the administrator to manage flight records in real time.
3. The **major tasks** is including integrating of suitable **route optimization algorithm** (like Dijkstra's) into the backend for computing the most efficient flight routes.
4. Established a seamless **connection between the frontend and Java backend** via java Servlet server, which enables real-time interaction between the user interface and backend data operations.

Enhancement and Future Scope

1. An upcoming enhancement is the inclusion of a **real-time weather forecast feature**, providing weather updates for the selected flight date.
2. Conversion of the Site into Advance Flight Booking system, offering multiple features.

Codebase Information

(Repository link, branch, and information about important commits.)

Repository link: <https://github.com/Abhay-k12/Optify---Airline-route-optimizer>

Key Commits :

1. Commits on Jun 18, 2025

[Merge pull request #2 from Abhay-k12/backup-branch](#)

 [anvesha23rawat](#)

[Remove duplicate frontend folder and keep only webapps](#)

 [anvesha23rawat](#)

committed

[Resolve merge conflicts and complete merge](#)

 [anvesha23rawat](#)

2. Commits on Jun 16, 2025

[final Structure of project](#)

 [Abhay-k12](#)

3. Commits on Jun 13, 2025

[Update code](#)

 [anvesha23rawat](#)

[Update code](#)

 [anvesha23rawat](#)

4. Commits on May 27, 2025

[Restore frontend directory and files](#)

 [anvesha23rawat](#)

[Delete frontend directory](#)

 [anvesha23rawat](#)

[Add frontend files to main repository](#)

5. Commits on May 25, 2025

[Merge pull request #1 from Abhay-k12/backup-branch](#)

 [Abhay-k12](#)

[Add Backend Files](#)

 [Abhay-k12](#)

6. Commits on May 24, 2025[addition of client backend files](#) [Abhay-k12](#)**7. Commits on May 23, 2025**[Add frontend files](#) [anvesha23rawat](#)**8. Commits on May 19, 2025**[addition of new files](#) [Abhay-k12](#)

Testing and Validation Status

(Provide information about any tests conducted)

Test Type	Status (Pass/Fail)	Notes
Backend graph creation and management	Pass	Flight data added and modified successfully
Admin terminal operations	Pass	Adds, updates, and suspends flights correctly
Frontend input forms	Pass	Captures client and admin inputs as intended
Route optimization algorithm	Pass	Dijkstra's Algorithm implemented
Frontend-backend connection	Pass	Implemented using java Servlet

Deliverables Progress

1. Graph-based flight management module	Completed
2. Client terminal interaction	Completed
3. Admin terminal interaction	Completed
4. Client and Admin web pages	Completed
5. Route optimization algorithm integration	Completed
6. Frontend-backend integration	Completed