Project overview

Introduction

Our project develops a Java-based traffic simulation that uses real streets around our university and communicates in real time with the SUMO simulator. The application visualizes vehicle movements, controls traffic lights, and provides insights into traffic flow and behavior. By using real street data, the simulation is not abstract but directly connected to our local environment and realistic traffic conditions.

Role Distribution+Timeline

Frontend-Development
Responsible for UI/UX, map visualization, and interaction.

Name	Tasks
Younes	Map rendering, zoom/move functions, UI components
Ali	Vehicle visualization, traffic light UI, statistics/charts

Backend-Development
Responsible for communication with SUMO, logic, data processing, and exporting.

Name	Tasks
Jonas	Real-time SUMO data, threads, vehicle generation
Hamza	Traffic logic, traffic light control, statistical calculations
David	Data export, logging, file handling & streams

Week	Task / Milestone	Responsible
Week 1	Project setup, architecture design, repository creation, planning SUMO communication	All
Week 2	Implement SUMO live data connection and threading foundation	Jonas
Week 3	Develop core traffic logic (vehicle generation + basic traffic light control)	Hamza
Week 4	Frontend foundations: map rendering, UI layout, zoom/move interaction	Younes
Week 5	Visualize vehicles and traffic lights in the UI	Ali
Week 6	Statistics: implement calculations (waiting time, traffic flow) + visualization (charts)	Hamza & Ali
Week 7	Implement export features (CSV/JSON) + logging and file handling	David
Week 8	Integrate backend with frontend-live data displayed on map	All

Week 9	Testing, debugging, performance optimization + preparation for final presentation/demo	All

Project Relation to the Local Environment

We simulate traffic on the **real streets around our university**.
This includes:

- real intersections and one-way streets
- realistic traffic light phases
- realistic traffic density

This makes the simulation feel
authentic and based on actual local traffic conditions, not abstract.

README File
https://github.com/JonasR204/Java-Project

Goal
To develop an interactive Java platform that communicates with SUMO in real time, visualizes traffic, controls it, and provides analytical insights.