Project Title: Real-Time Traffic Analysis

Week#1:First Milestone of the Project to Understand the project.

Prepared By:

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- ***Dawood Baig (FA24-BCS-395)***

1:Introduction:

1. Team Members:

- *Muneeb – Team Lead, Graph Guru, Organizer.*
- *Dawood – DS Wizard, Stack Sentinel, Idea Machine.*

2. Fun DS Roles

- *Muneeb the Graph Guru – connects all roads, intersections, and paths.*
- *Dawood the Stack Sentinel – manages urgent alerts using LIFO.*

2: Creative Project Story:

(Issue or problem):

In the busy digital city of London, traffic changes every second.
To solve** daily road chaos**, Muneeb** and **Dawood** created **"the Real-Time Traffic Analysis System."
*Graph Guru **Muneeb** mapped every intersection as a node and each road as an edge, building a perfect graph of the city.*
His graph detected shortest paths, heavy traffic zones, and alternate routes.
*Meanwhile, Stack Sentinel **Dawood** managed incoming traffic alerts using a stack—latest and most urgent alerts were handled first.*
Whenever sensor spikes happened, alerts were pushed onto the stack and processed in order.
The system showed real-time congestion, smart routes, and automated summaries.
With Graph ensuring smooth navigation and Stack ensuring fast alert handling, London moved

efficiently again.
Together, they built a smart, reliable, DS-powered real time traffic analysis project.

3.DS Character Creation:

Graph:

*Graph Guru **Muneeb** – Master of nodes & edges; builds the full traffic network.*

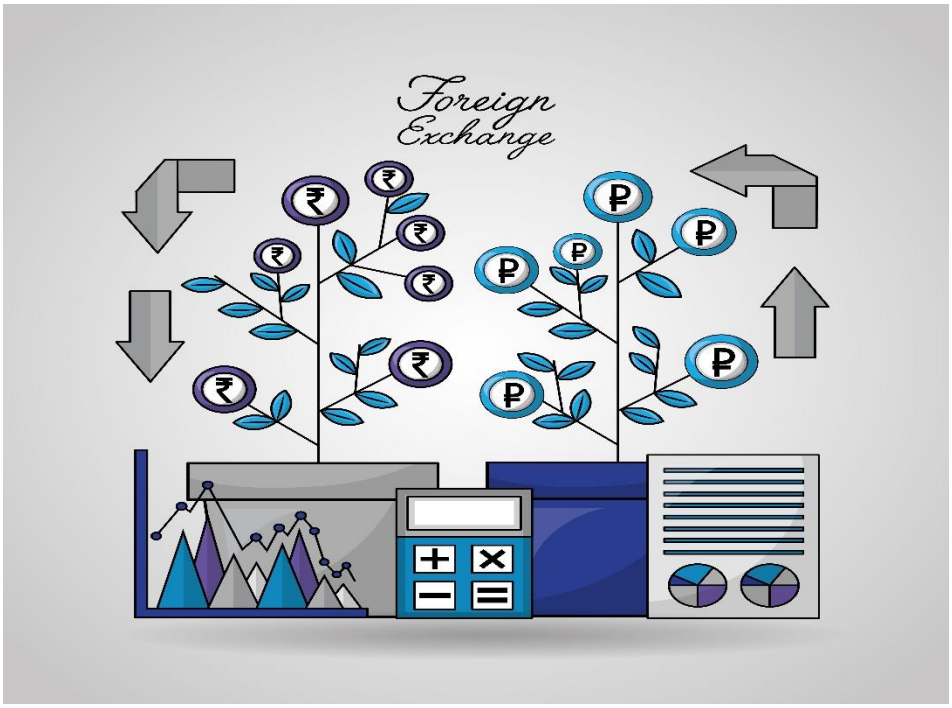
Graph Navigator – Directs drivers through intersections and turns.

Graph Pathfinder – Finds shortest and fastest routes.

Graph Monitor – Detects traffic jams and congested nodes.

Picture:

representing Graphs nodes as leaf, and also edges such as connection representation of graph



Stack:

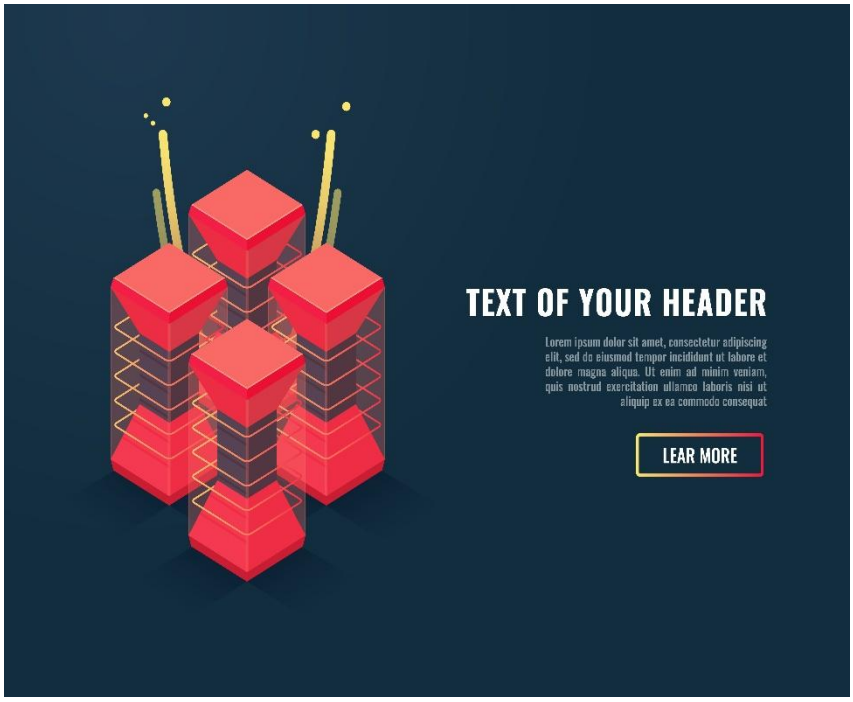
*Stack Sentinel **Dawood** – Handles urgent traffic alerts using LIFO.*

Stack Checker – Verifies new alerts before adding them to the stack.

Stack Watcher – Tracks processed and dismissed alerts

Picture:

Representing stack (LIFO) last in first out as these four blocks as ring that are set as stack.

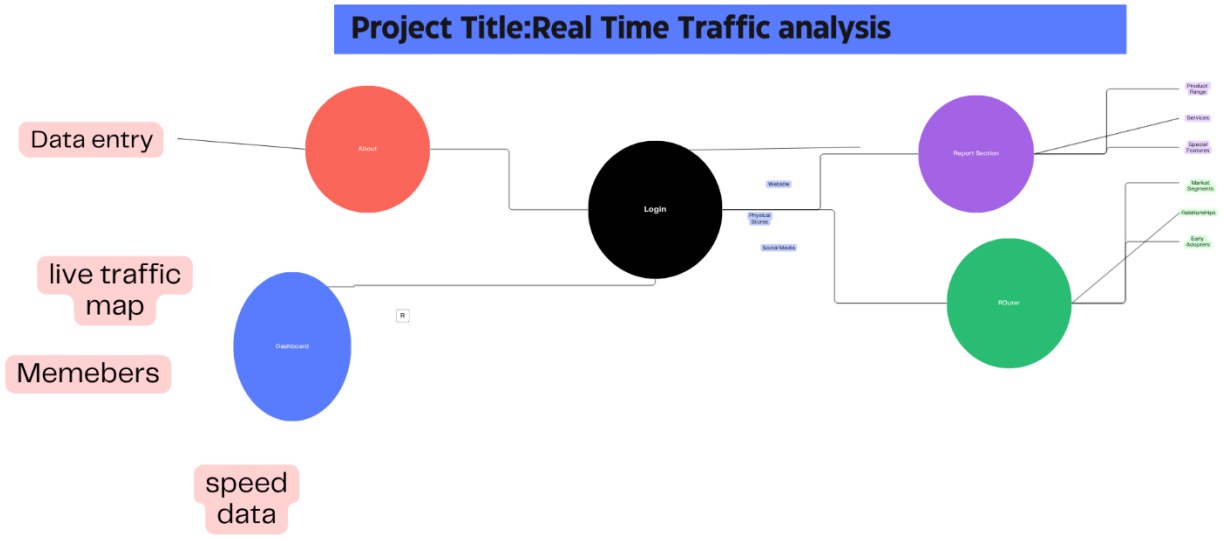


System Mapping:

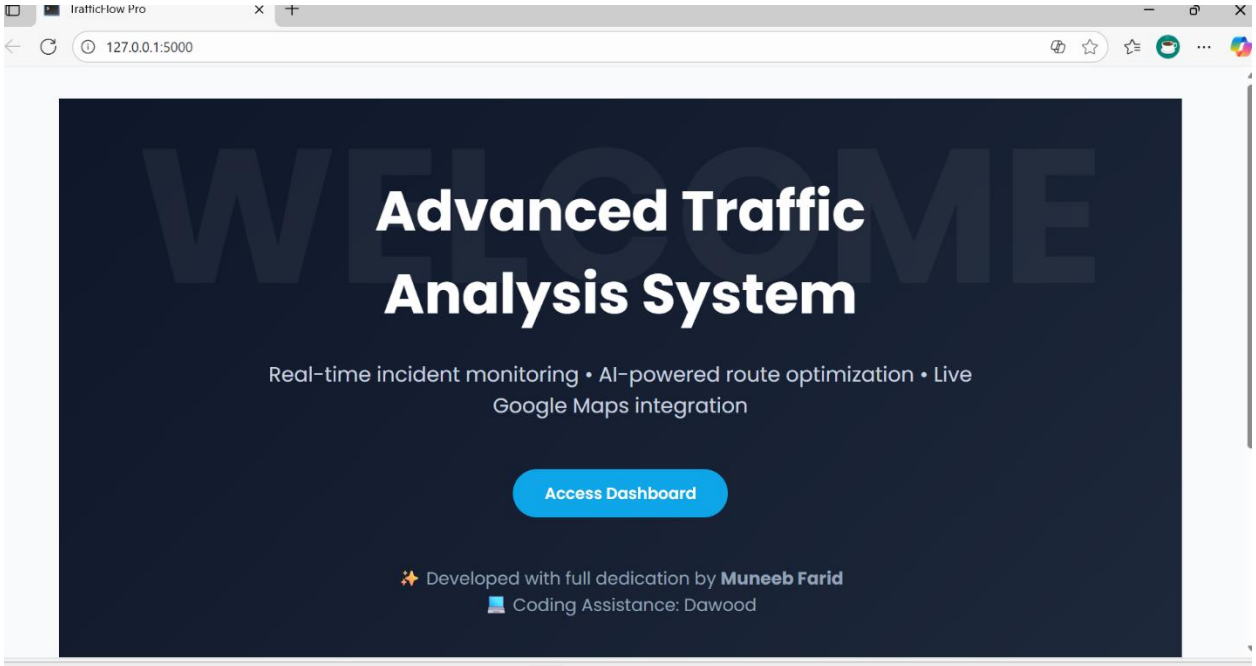
- *There are four pages:*
- *First page of login*
- *Second page About*
- *Third Page of Map (router)*
- *Fourth Page (report Section)*

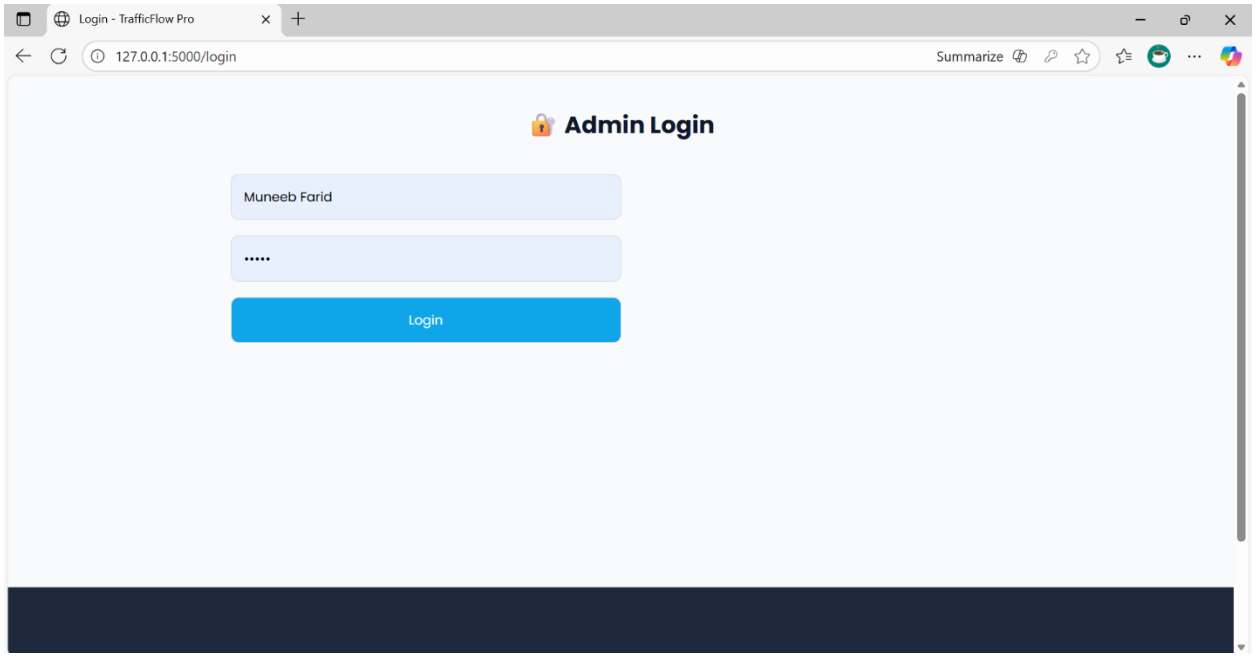
There are following system mapping through canvas which is digital platform of system mapping or presentation etc:

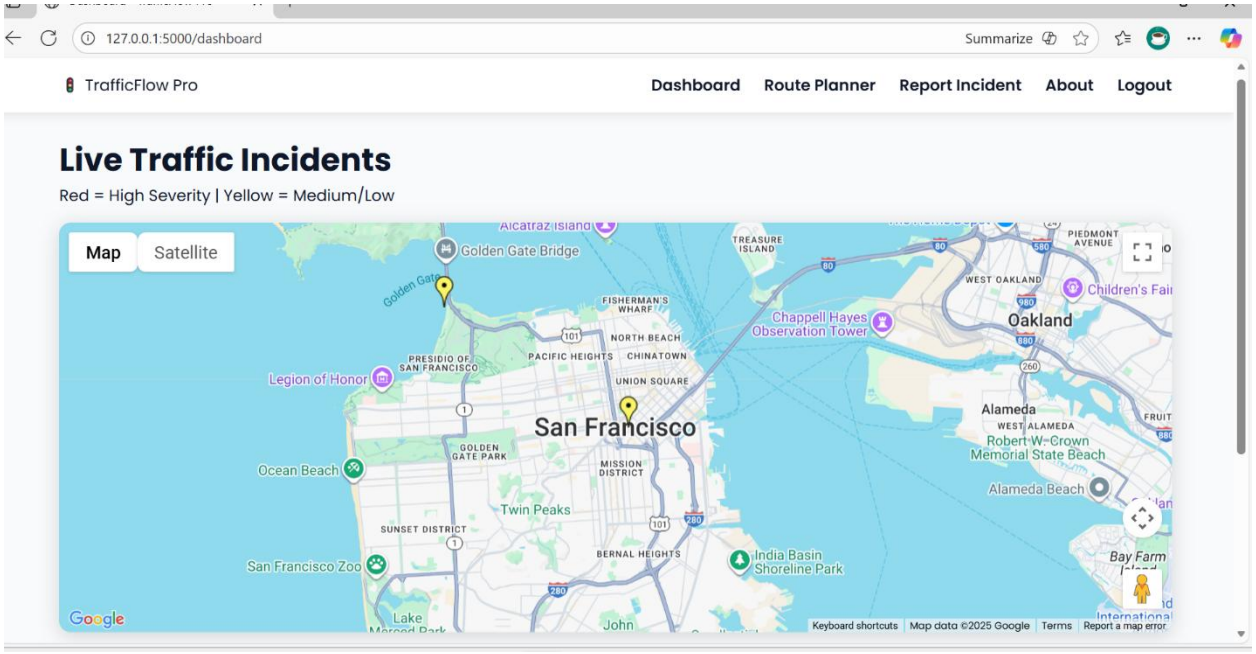
As Shown:



Project Pages Picture:




Login - TrafficFlow Pro
127.0.0.1:5000/login
Summarize
Admin Login
Muneeb Farid
.....
Login


127.0.0.1:5000/dashboard
Summarize
TrafficFlow Pro
Dashboard
Route Planner
Report Incident
About
Logout
Live Traffic Incidents
Red = High Severity | Yellow = Medium/Low
Map
Satellite
Golden Gate Bridge
Alcatraz Island
TREASURE ISLAND
PIEDMONT AVENUE
WEST OAKLAND
Children's Fair
Oakland
Chappell Hayes Observation Tower
FISHERMAN'S WHARF
NORTH BEACH
PACIFIC HEIGHTS
CHINATOWN
PRESIDIO OF SAN FRANCISCO
Legion of Honor
UNION SQUARE
San Francisco
Alameda
WEST ALAMEDA
Robert W. Crown Memorial State Beach
Alameda Beach
GOLDEN GATE PARK
MISSION DISTRICT
Ocean Beach
Twin Peaks
SUNSET DISTRICT
BERNAL HEIGHTS
India Basin Shoreline Park
San Francisco Zoo
Bay Farm
Google
Keyboard shortcuts
Map data ©2025 Google
Terms
Report a map error

127.0.0.1:5000/dashboard

Summarize

TrafficFlow Pro

Dashboard Route Planner Report Incident About Logout

Live Traffic Incidents

Red = High Severity | Yellow = Medium/Low

127.0.0.1:5000/route-planner

Summarize

TrafficFlow Pro

Dashboard Route Planner Report Incident About Logout

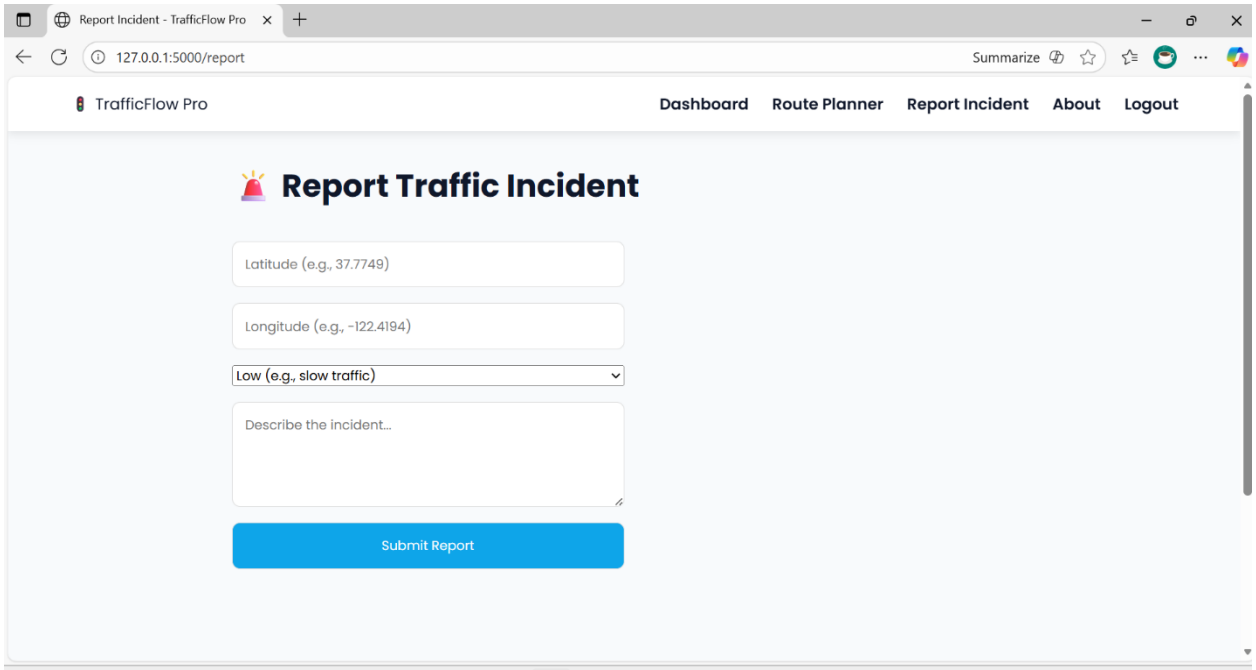
Route Planner (Dijkstra Demo)

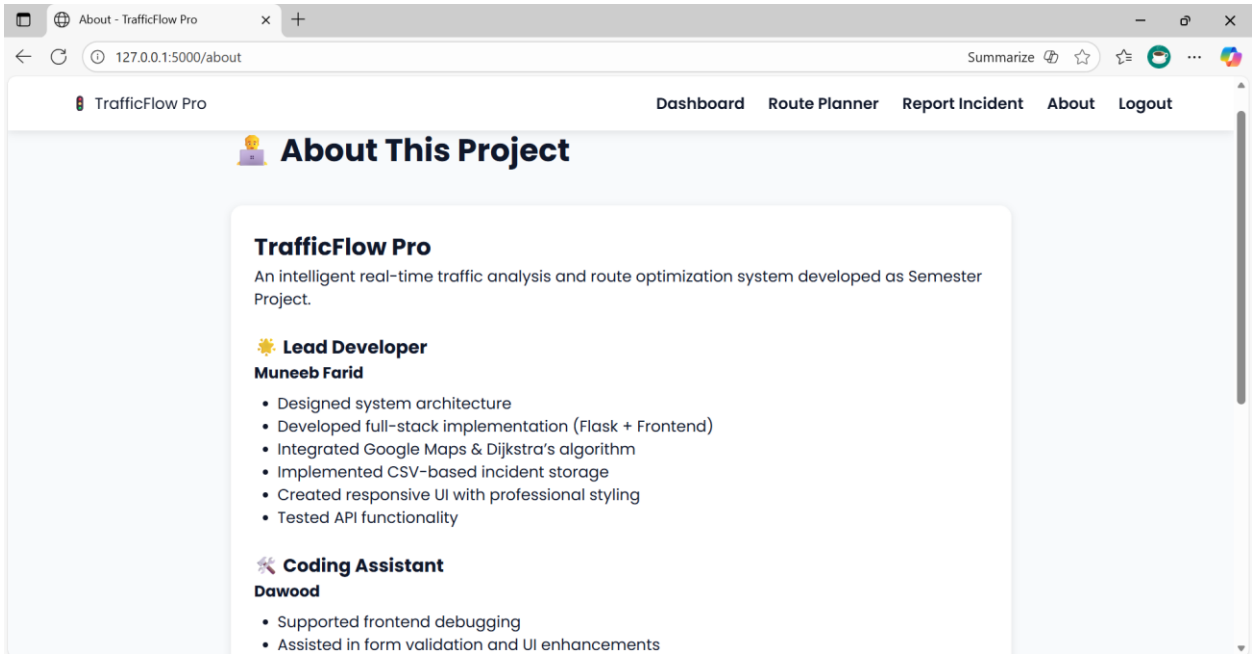
Enter source and target nodes (e.g., A → C)

Source (e.g., A)

Target (e.g., C)

Calculate Shortest Path

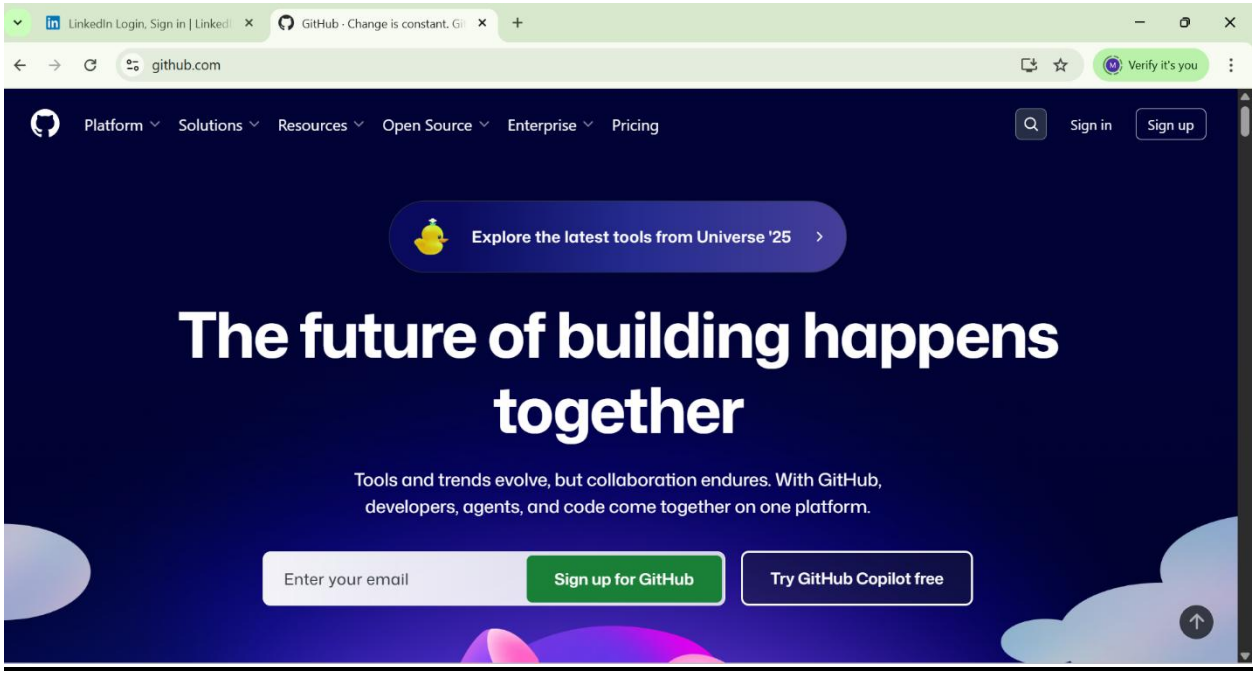

Report Incident - TrafficFlow Pro
127.0.0.1:5000/report
Summarize
TrafficFlow Pro
Dashboard
Route Planner
Report Incident
About
Logout
Report Traffic Incident
Latitude (e.g., 37.7749)
Longitude (e.g., -122.4194)
Low (e.g., slow traffic)
Describe the incident...
Submit Report

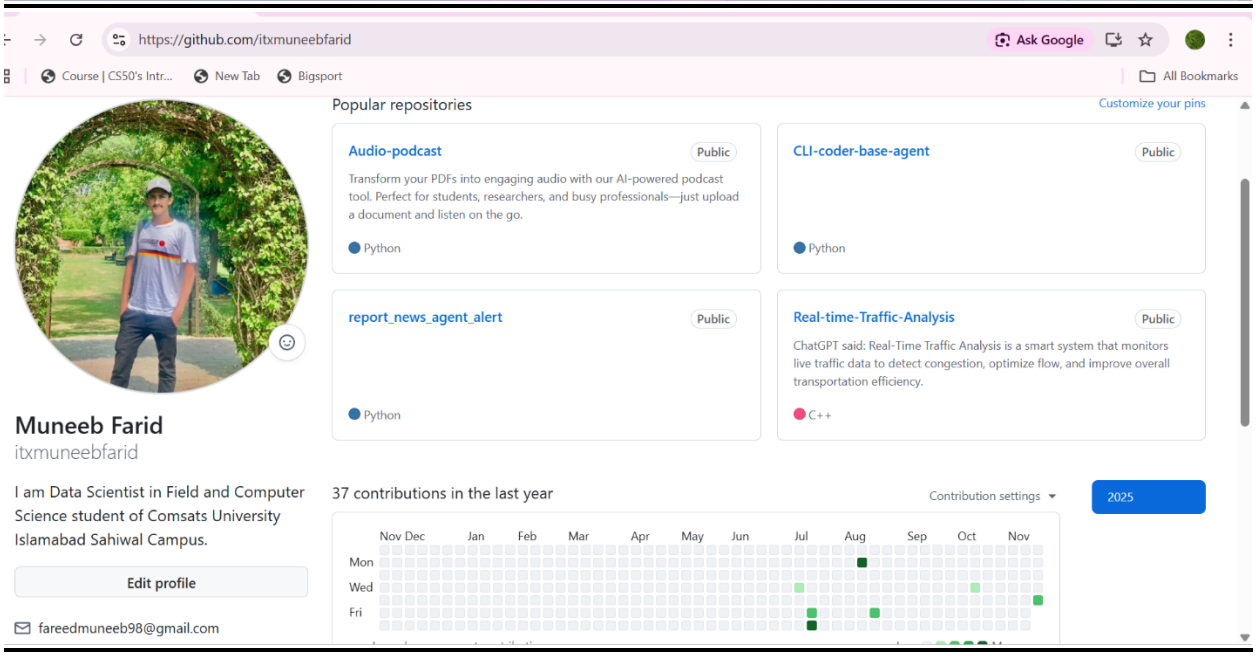

About - TrafficFlow Pro
127.0.0.1:5000/about
Summarize
TrafficFlow Pro
Dashboard
Route Planner
Report Incident
About
Logout
About This Project
TrafficFlow Pro
An intelligent real-time traffic analysis and route optimization system developed as Semester Project.
Lead Developer
Muneeb Farid
Designed system architecture
Developed full-stack implementation (Flask + Frontend)
Integrated Google Maps & Dijkstra's algorithm
Implemented CSV-based incident storage
Created responsive UI with professional styling
Tested API functionality
Coding Assistant
Dawood
Supported frontend debugging
Assisted in form validation and UI enhancements

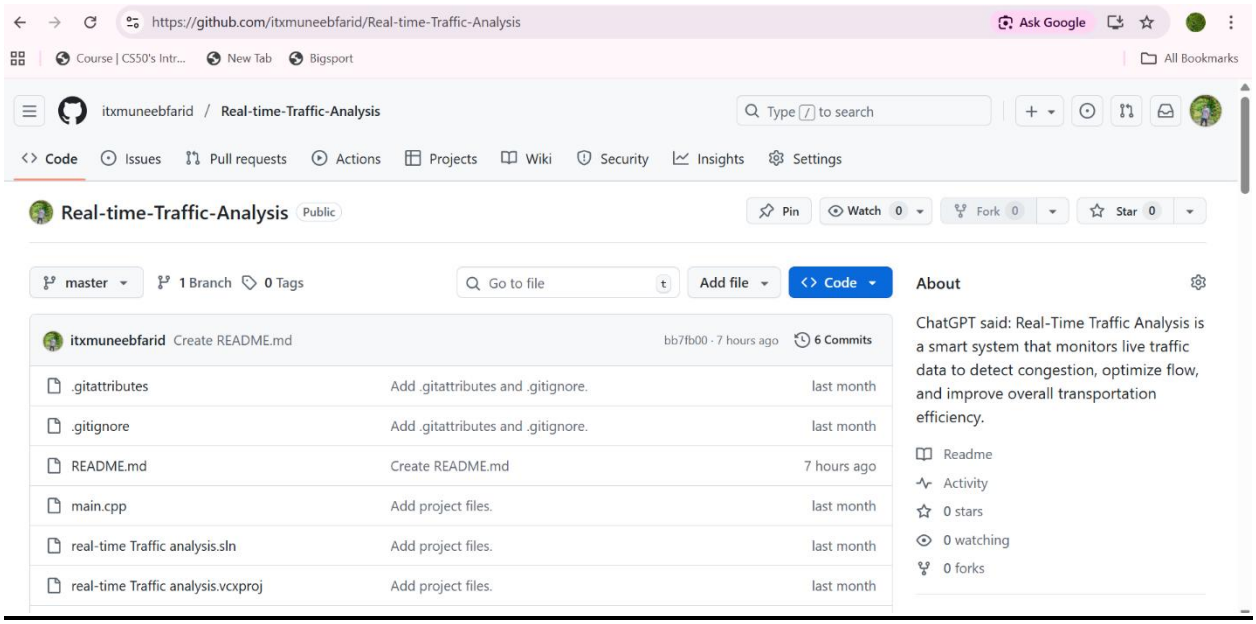
4:Github Activity:

Muneeb Github Profile:

Picture:



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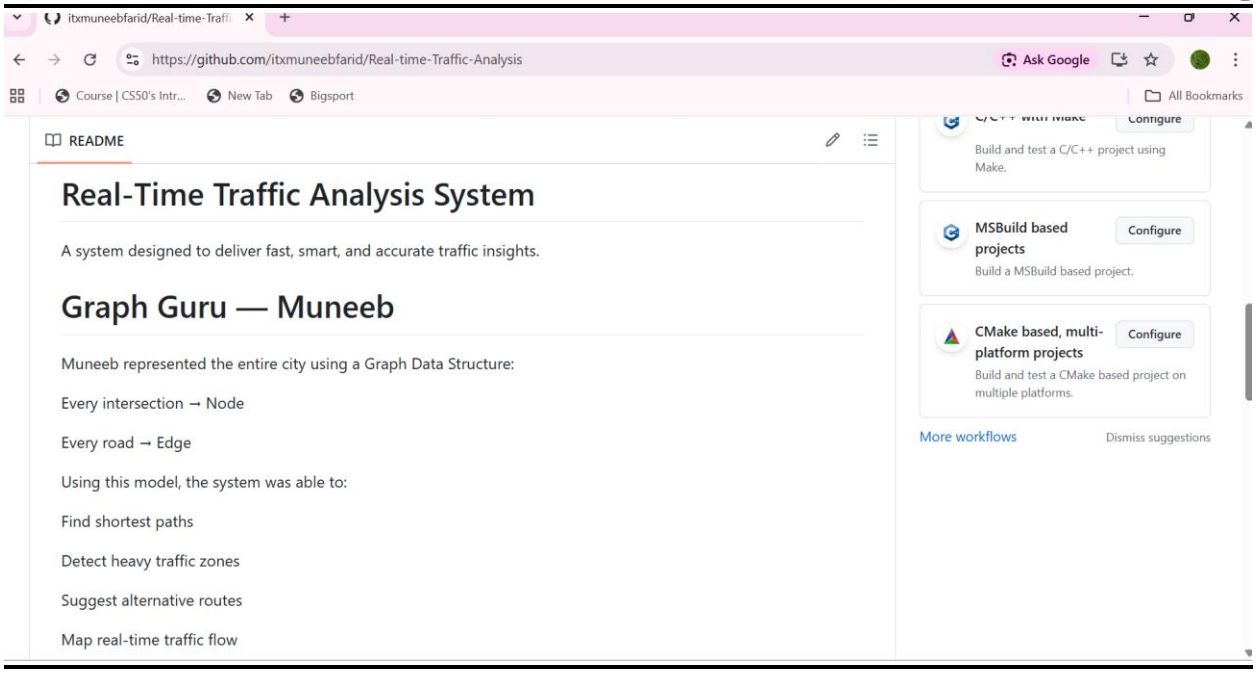
Type / to search
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
Real-time-Traffic-Analysis
Public
Pin
Watch 0
Fork 0
Star 0
master
1 Branch
0 Tags
Go to file
t
Add file
Code
itxmuneebfarid Create README.md
bb7fb00 · 7 hours ago
6 Commits
.gitattributes
Add .gitattributes and .gitignore.
last month
.gitignore
Add .gitattributes and .gitignore.
last month
README.md
Create README.md
7 hours ago
main.cpp
Add project files.
last month
real-time Traffic analysis.sln
Add project files.
last month
real-time Traffic analysis.vcxproj
Add project files.
last month
About
ChatGPT said: Real-Time Traffic Analysis is a smart system that monitors live traffic data to detect congestion, optimize flow, and improve overall transportation efficiency.
Readme
Activity
0 stars
0 watching
0 forks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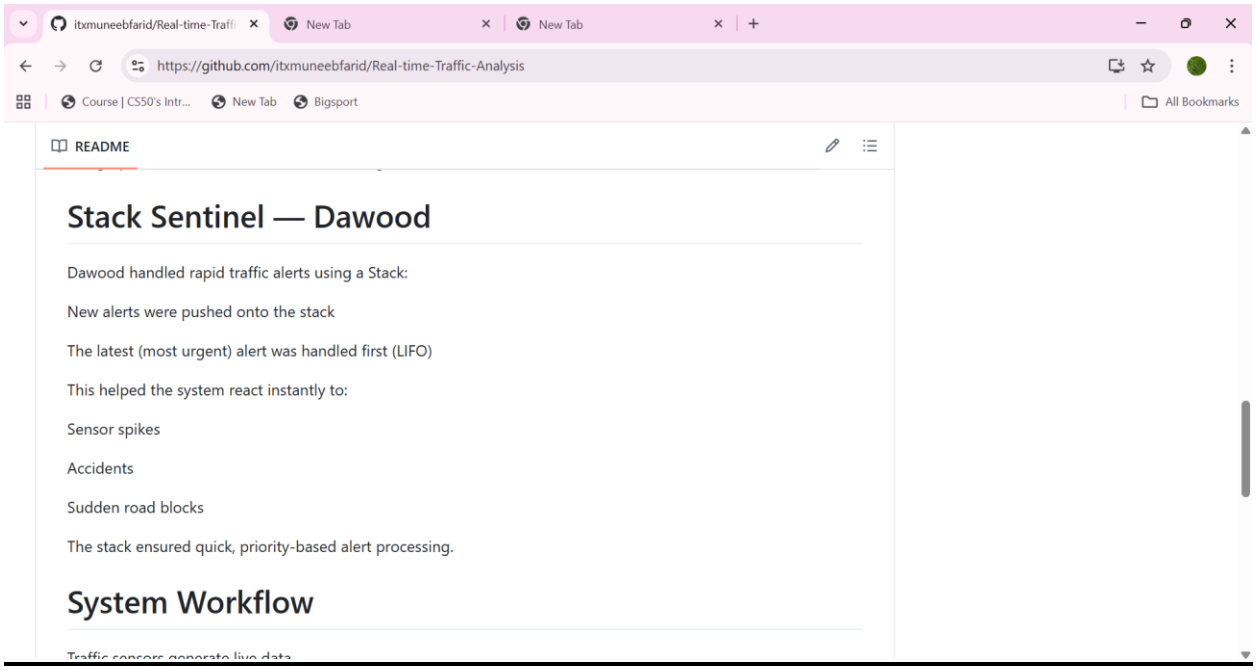
README
Real-Time Traffic Analysis System
A system designed to deliver fast, smart, and accurate traffic insights.
Graph Guru — Muneeb
Muneeb represented the entire city using a Graph Data Structure:
Every intersection → Node
Every road → Edge
Using this model, the system was able to:
Find shortest paths
Detect heavy traffic zones
Suggest alternative routes
Map real-time traffic flow
Configure
Build and test a C/C++ project using Make.
MSBuild based projects
Configure
Build a MSBuild based project.
CMake based, multi-platform projects
Configure
Build and test a CMake based project on multiple platforms.
More workflows
Dismiss suggestions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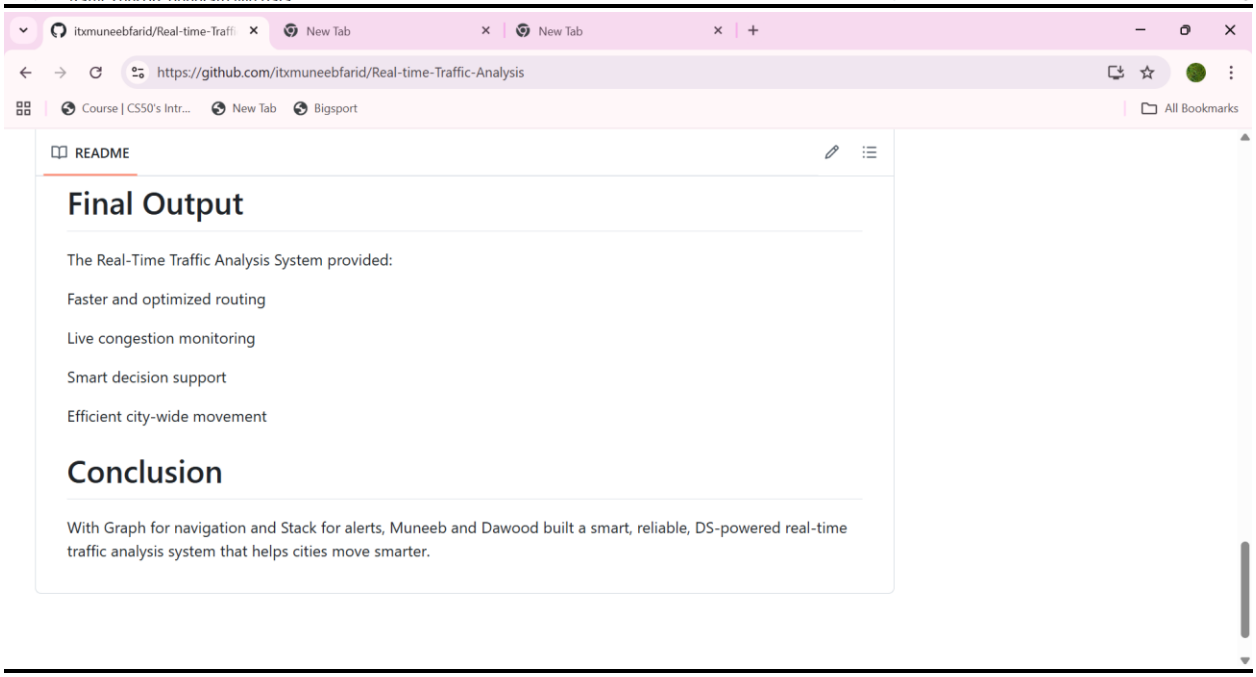
README
Stack Sentinel — Dawood
Dawood handled rapid traffic alerts using a Stack:
New alerts were pushed onto the stack
The latest (most urgent) alert was handled first (LIFO)
This helped the system react instantly to:
Sensor spikes
Accidents
Sudden road blocks
The stack ensured quick, priority-based alert processing.
System Workflow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https://github.com/itxmuneebfarid/Real-time-Traffic-Analysis
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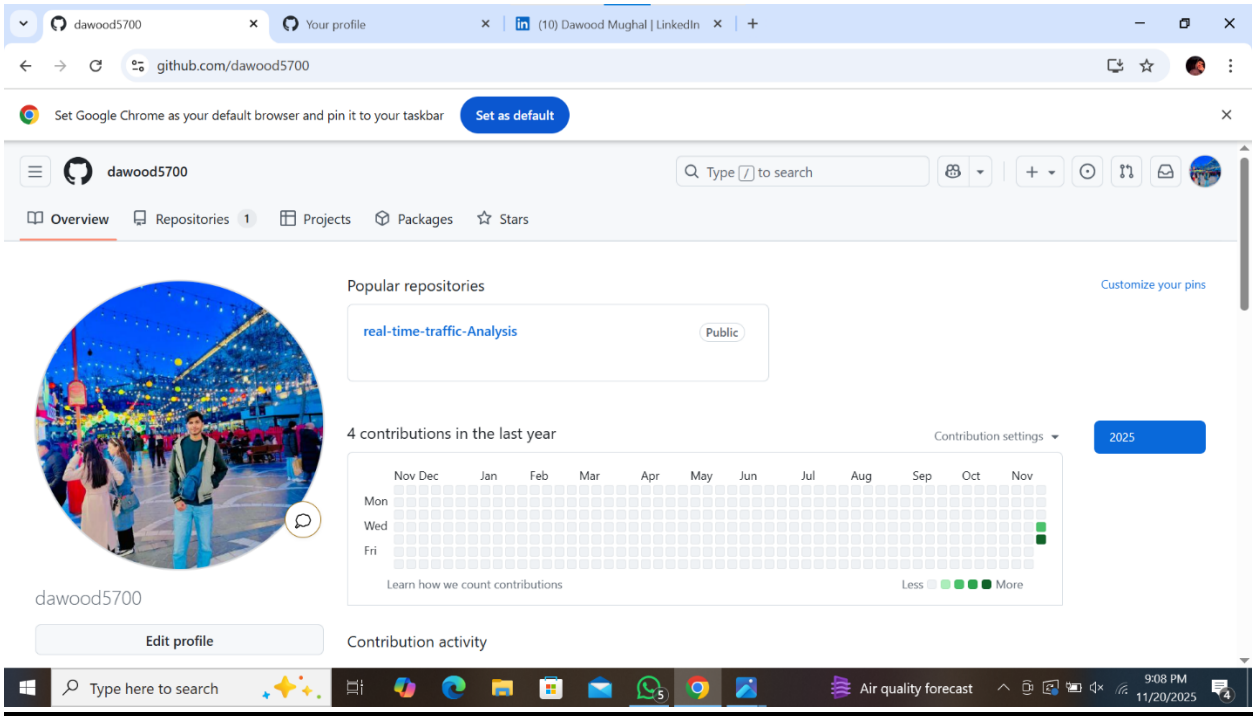
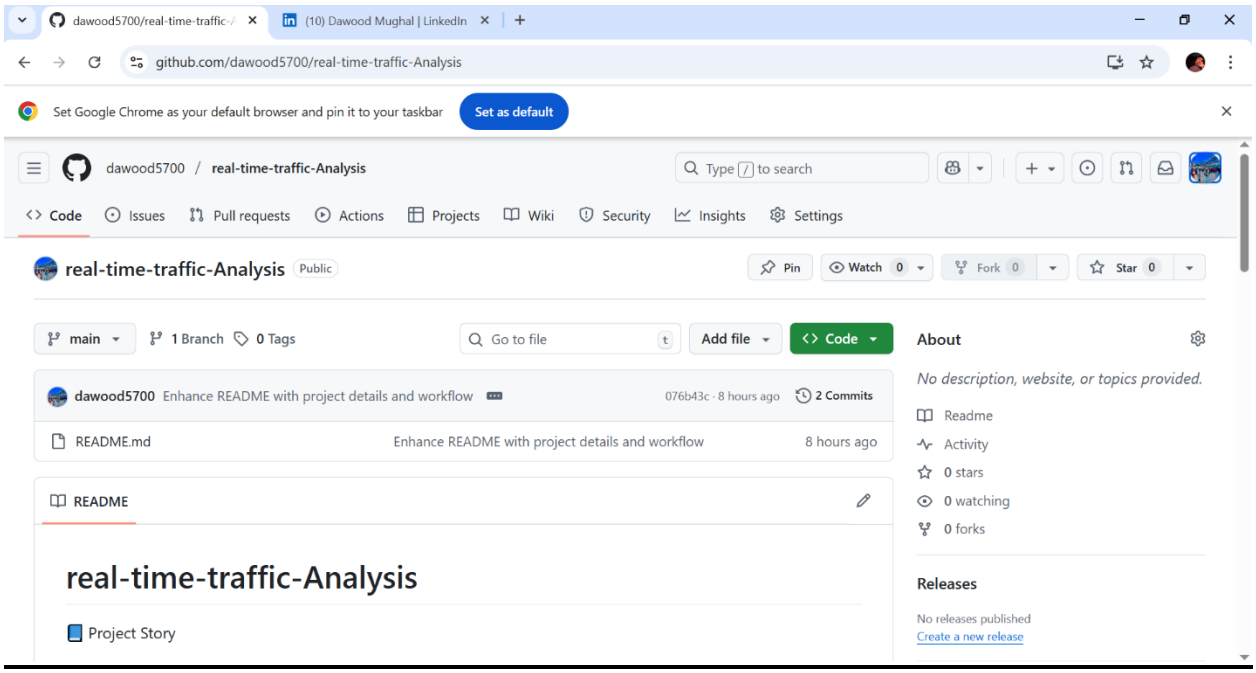
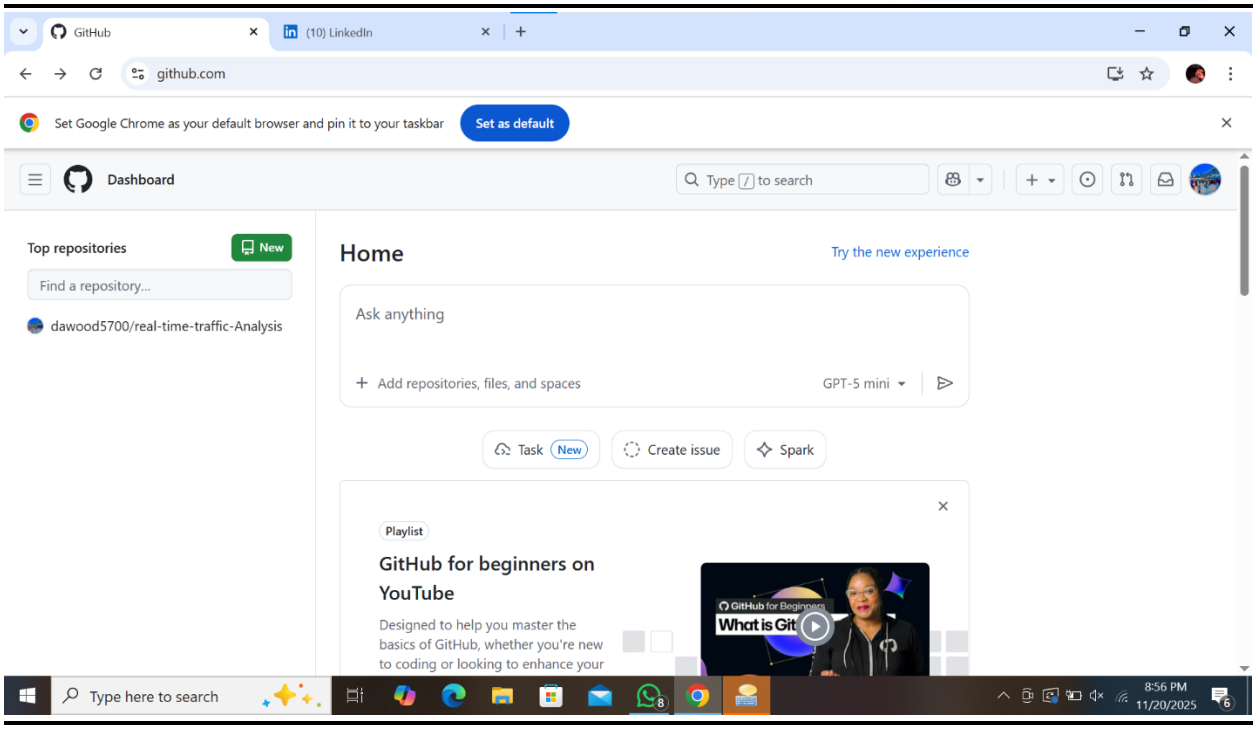
README
Final Output
The Real-Time Traffic Analysis System provided:
Faster and optimized routing
Live congestion monitoring
Smart decision support
Efficient city-wide movement
Conclusion
With Graph for navigation and Stack for alerts, Muneeb and Dawood built a smart, reliable, DS-powered real-time traffic analysis system that helps cities move smarter.

Dawood Github Profile:

Picture:

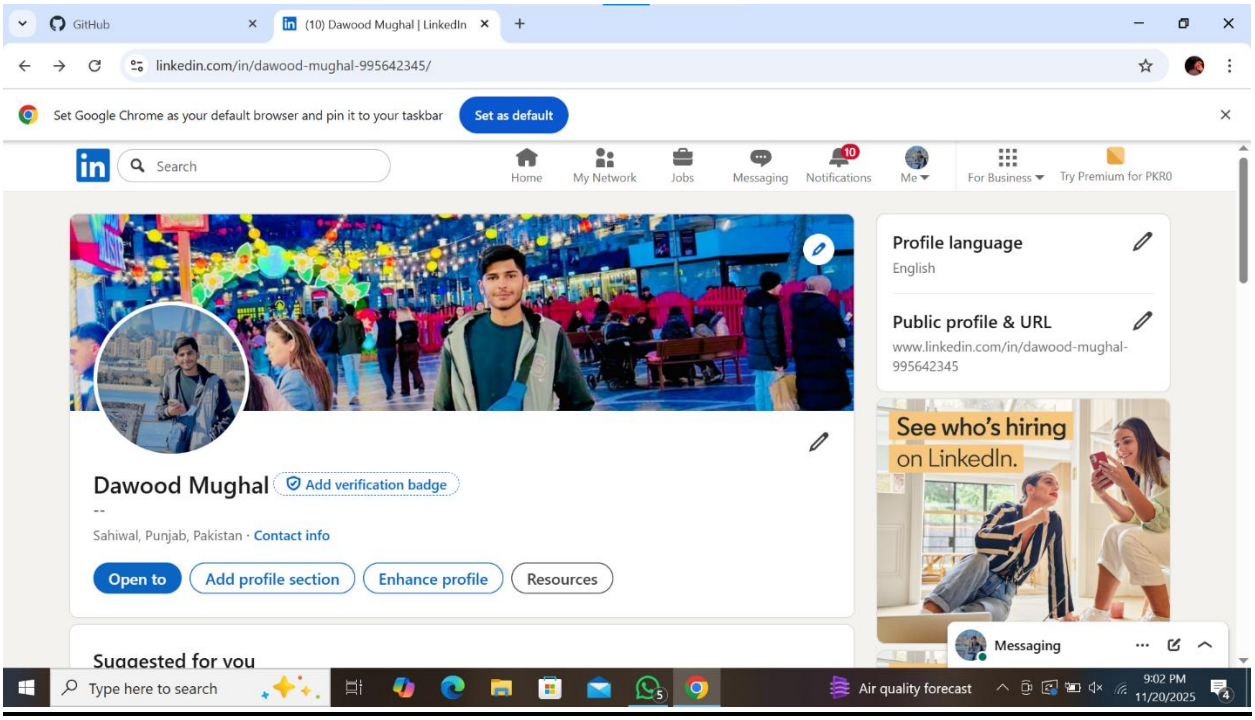




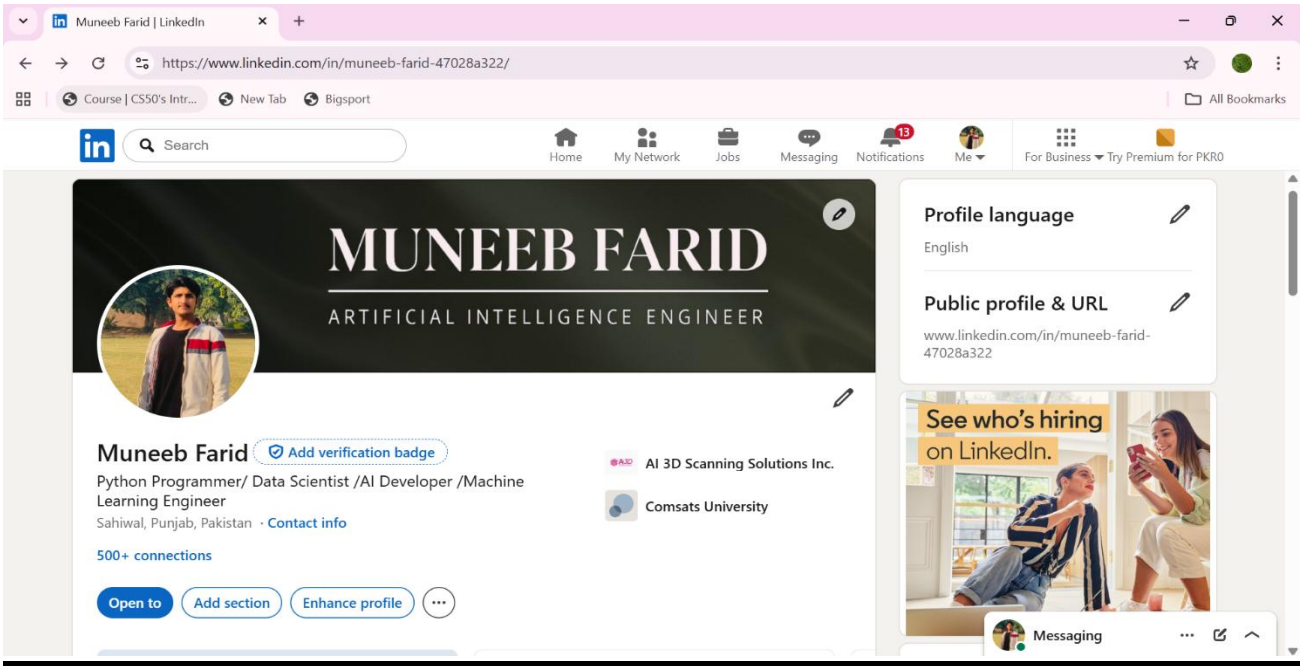


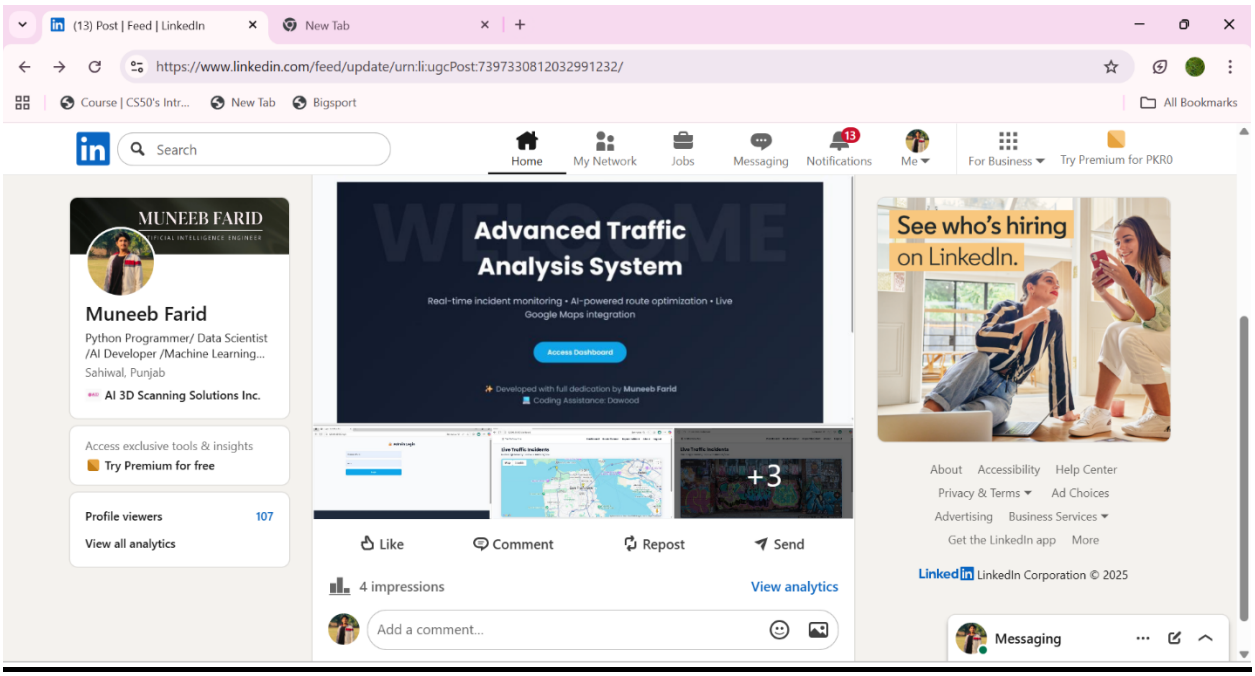
6:Linked Activity:

Dawood Profile:



Muneeb Profile:





Links:

Linkedin: *https://www.linkedin.com/in/muneeb-farid-47028a322/*

Github: *https://github.com/itxmuneebfarid/Real-time-Traffic-Analysis*

Reference: *Data Structure Teacher Miss Mina.*