

Project Title: Real-Time Traffic Analysis

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

Prepared By:

- **Muneeb Farid (FA24-BCS-380)**
- **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.

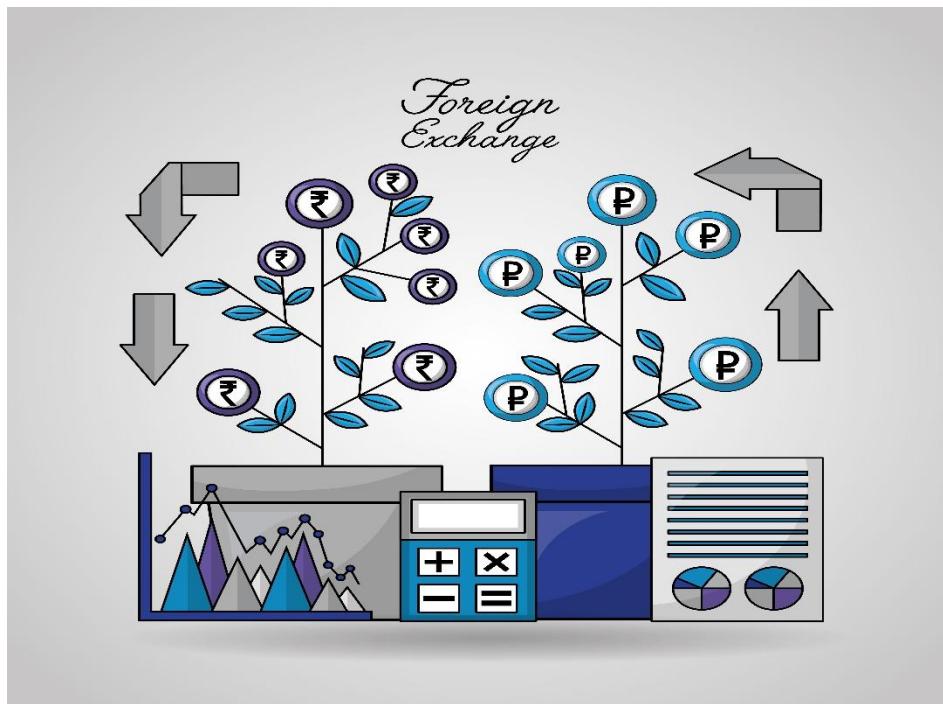
Graph Navigator – Directs drivers through intersections and turns.

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:

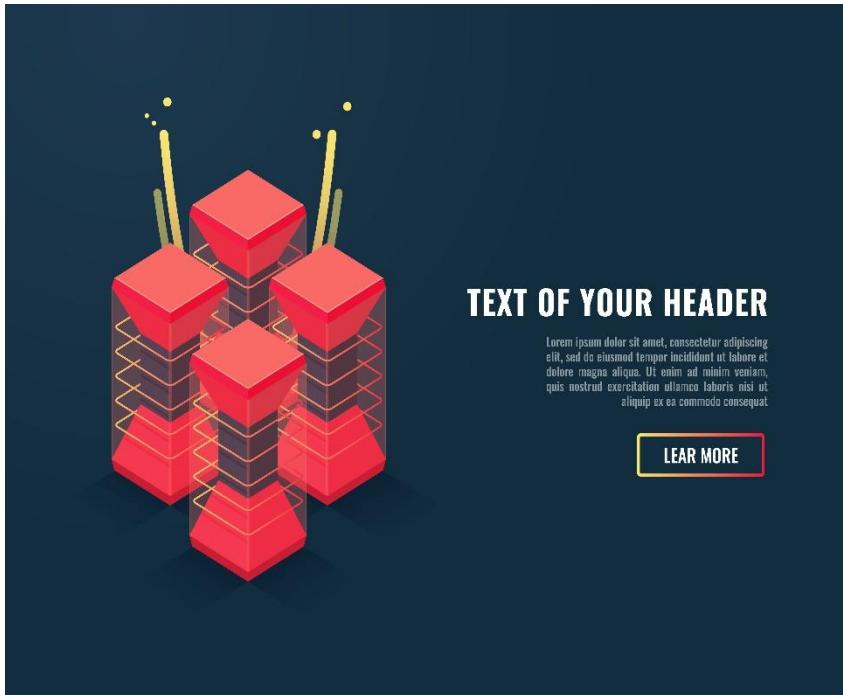
Stack Sentinel Dawood – Handles urgent traffic alerts using LIFO.

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.

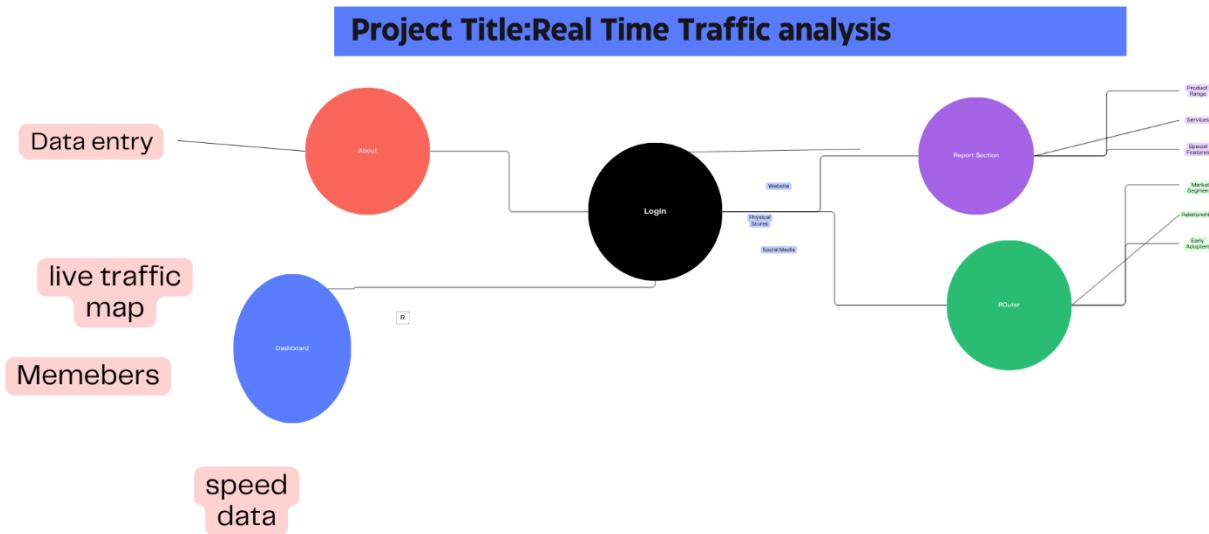


System Mapping:

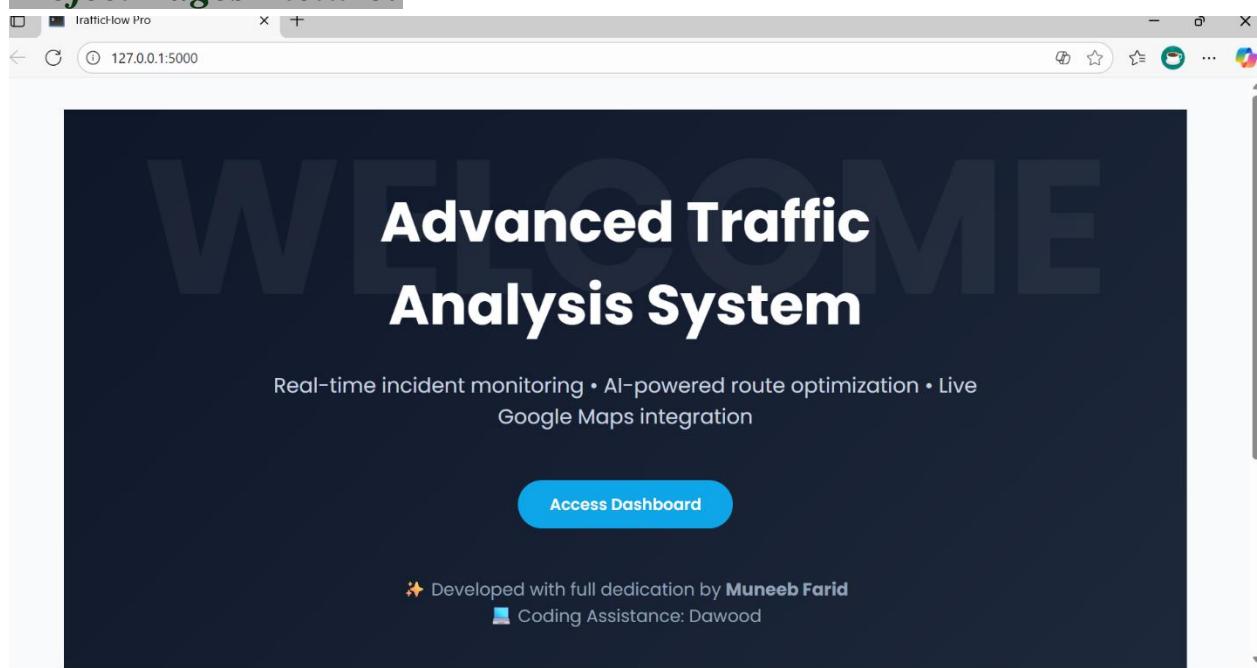
- ❖ *There are four pages:*
- ❖ *First page of login*
- ❖ *Second page About*
- ❖ *Third Page of Map (router)*
- ❖ *Fourth Page (report Section)*

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

As Shown:



Project Pages Picture:



Admin Login

User Name: Muneeb Farid

Password:

Login

The screenshot shows the TrafficFlow Pro dashboard with the title "Live Traffic Incidents". A legend indicates that red dots represent high severity incidents and yellow dots represent medium or low severity. The map displays the San Francisco Bay Area, including the city of San Francisco and surrounding areas like Alameda and Oakland. Key landmarks are labeled, such as the Golden Gate Bridge, Alcatraz Island, Fisherman's Wharf, and the Legion of Honor. A yellow dot is visible near the Golden Gate Bridge, indicating a traffic incident. The map also shows major roads like I-80, I-580, and I-280. The interface includes navigation buttons for "Map" and "Satellite" views, and a top bar with links for "Dashboard", "Route Planner", "Report Incident", "About", and "Logout".

127.0.0.1:5000/dashboard

TrafficFlow Pro Dashboard Route Planner Report Incident About Logout

Live Traffic Incidents

Red = High Severity | Yellow = Medium/Low

Google Keyboard shortcuts | © T. Barnes | Terms | Report a problem

127.0.0.1:5000/route-planner

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:

The screenshot shows the GitHub homepage at the top, featuring a dark blue header with navigation links like 'Platform', 'Solutions', 'Resources', 'Open Source', 'Enterprise', and 'Pricing'. Below the header is a prominent banner with the text 'Explore the latest tools from Universe '25' and a yellow chick icon. The main title 'The future of building happens together' is displayed in large white font. Below the title, a subtitle reads 'Tools and trends evolve, but collaboration endures. With GitHub, developers, agents, and code come together on one platform.' At the bottom of the banner are three calls-to-action: 'Enter your email', 'Sign up for GitHub', and 'Try GitHub Copilot free'.

The main content area shows the user's profile. It features a circular profile picture of a young man (Muneeb Farid) standing outdoors under a green archway. Below the picture, the user's name 'Muneeb Farid' and GitHub handle 'itxmuneefarid' are displayed. A bio states: 'I am Data Scientist in Field and Computer Science student of Comsats University Islamabad Sahiwal Campus.' To the right of the profile picture, there are four 'Popular repositories' cards:

- Audio-podcast** (Public): 'Transform your PDFs into engaging audio with our AI-powered podcast tool. Perfect for students, researchers, and busy professionals—just upload a document and listen on the go.' Language: Python.
- CLI-coder-base-agent** (Public): 'Python'
- report_news_agent_alert** (Public): 'Python'
- Real-time-Traffic-Analysis** (Public): 'C++': '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.'

Below the repositories, a section titled '37 contributions in the last year' shows a heatmap of activity. The heatmap grid spans from November of the previous year to November of the current year. Contributions are represented by colored squares (green, blue, red). The heatmap shows a significant cluster of activity in August and September of the current year, with some smaller contributions scattered throughout the period.

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

itxmuneebfarid / Real-time-Traffic-Analysis

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Real-time-Traffic-Analysis Public

master 1 Branch 0 Tags Go to file Add file Code About

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

itxmuneebfarid/Real-time-Traffic-Analysis

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

Build and test a C/C++ project using Make. Configure

Build a MSBuild based project. Configure

Build and test a CMake based project on multiple platforms. Configure

More workflows Dismiss suggestions

The screenshot shows a web browser window with the URL <https://github.com/itxmuneebfarid/Real-time-Traffic-Analysis>. The page displays the **README** file. The content includes:

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

Traffic sensors generate live data

Final Output

The Real-Time Traffic Analysis System provided:

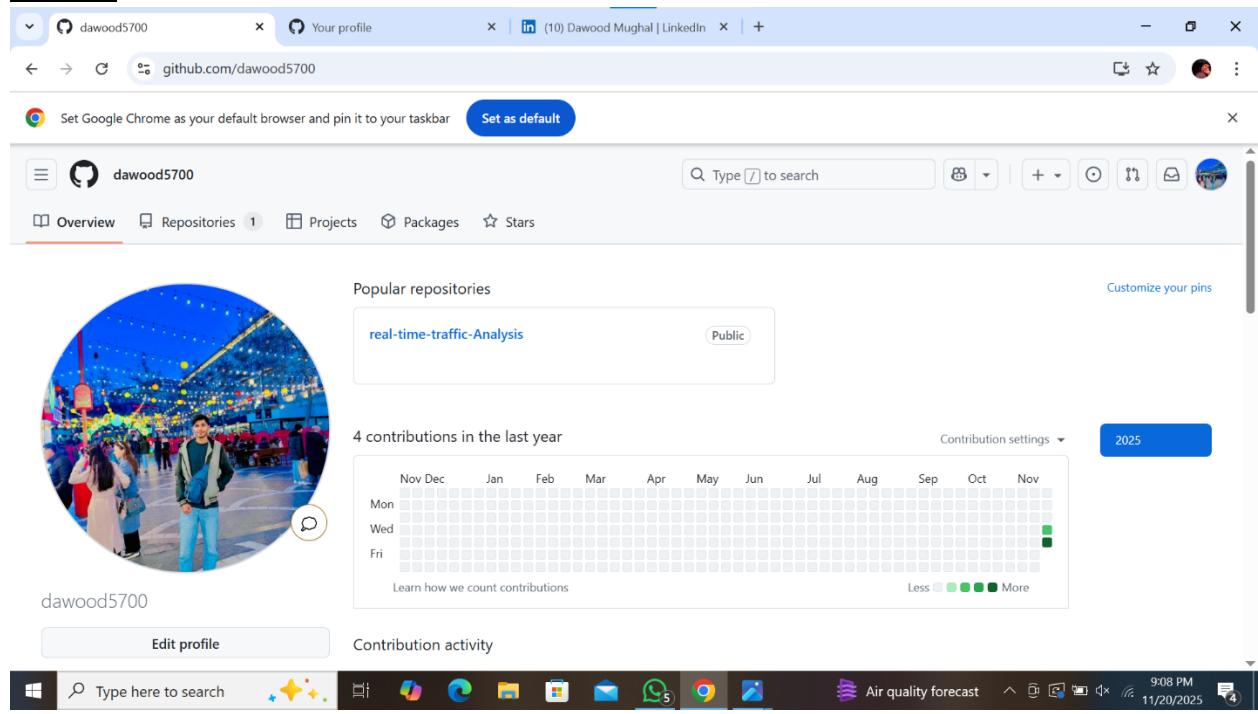
- Faster and optimized routing
- Live congestion monitoring
- Smart decision support
- Efficient city-wide movement

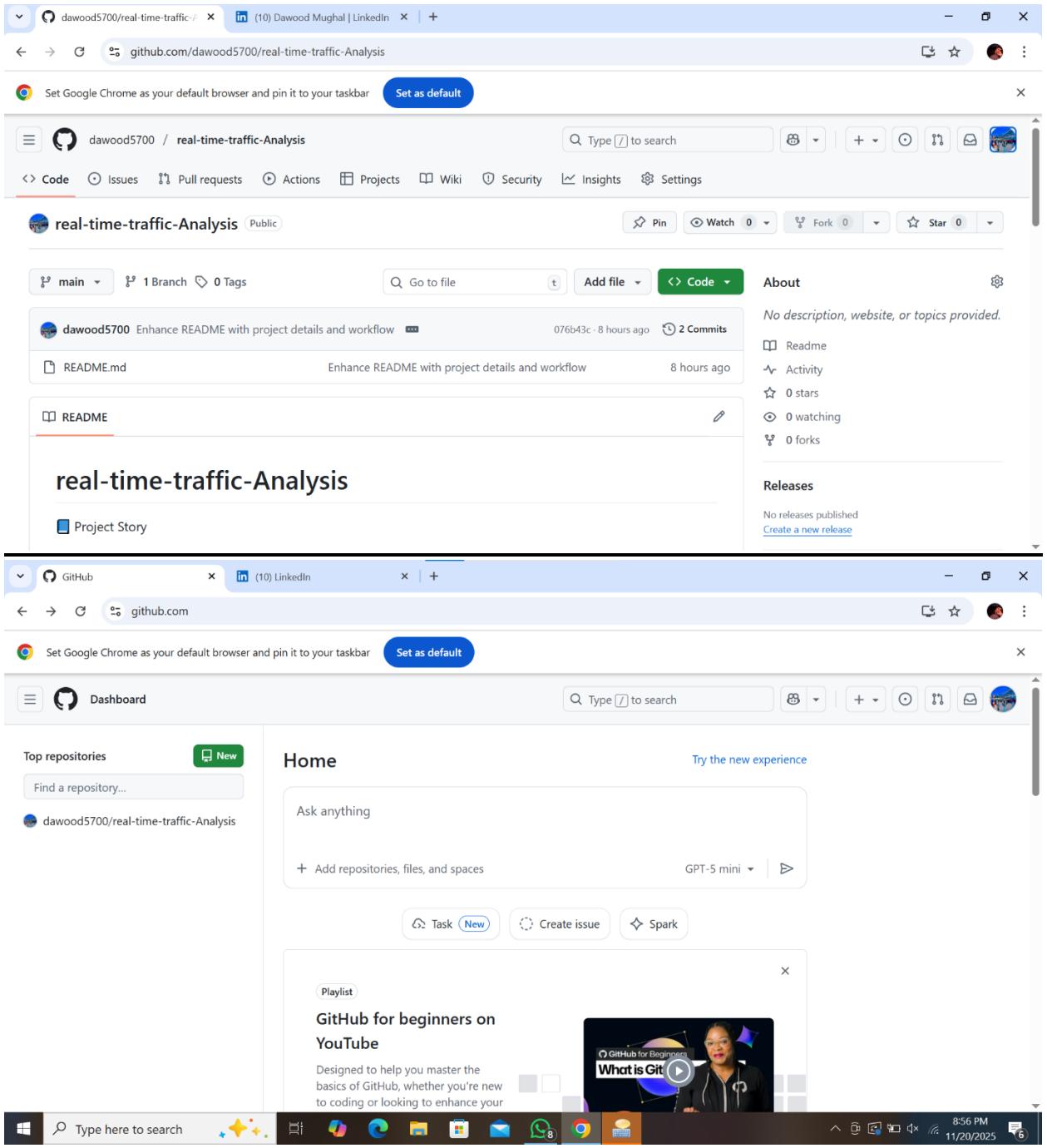
Conclusion

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:

The screenshot shows a LinkedIn profile page for Dawood Mughal. At the top, there's a banner with a photo of a festive outdoor event and a smaller circular inset photo. Below the banner, Dawood's name is displayed with a blue verified badge and a link to add a verification badge. His location is listed as Sahiwal, Punjab, Pakistan, with a link to contact info. There are four action buttons: Open to, Add profile section, Enhance profile, and Resources. To the right, there are sections for Profile language (English), Public profile & URL (with a link to www.linkedin.com/in/dawood-mughal-995642345), and a "See who's hiring" section featuring two people. The bottom of the screen shows a Windows taskbar with a search bar, pinned apps like File Explorer, Edge, and Mail, and system status icons for air quality forecast (9:02 PM, 11/20/2025).

Muneeb Profile:

The screenshot shows Muneeb Farid's LinkedIn profile. At the top, there is a circular profile picture of a young man. Below it, the name "MUNEEB FARID" is displayed in large, bold letters, followed by the title "ARTIFICIAL INTELLIGENCE ENGINEER". To the left of the main profile area, there is a smaller circular thumbnail of the same person. Below the profile picture, the name "Muneeb Farid" is listed, followed by a blue button with a white icon and the text "Add verification badge". Underneath this, the bio reads: "Python Programmer/ Data Scientist /AI Developer /Machine Learning Engineer" and "Sahiwal, Punjab, Pakistan - Contact info". To the right of the bio, there are two company logos: "AI 3D Scanning Solutions Inc." and "Comsats University". Below the bio, it says "500+ connections". At the bottom of the profile section, there are four buttons: "Open to", "Add section", "Enhance profile", and three dots. On the right side of the screen, there is a sidebar with sections for "Profile language" (set to English), "Public profile & URL" (with the URL www.linkedin.com/in/muneeb-farid-47028a322), and a promotional image for "See who's hiring on LinkedIn".

The screenshot shows a LinkedIn post by Muneeb Farid. The post features a dark background with the text "WELCOME" in large, semi-transparent letters. The main content of the post is titled "Advanced Traffic Analysis System" and includes a sub-headline "Real-time incident monitoring • AI-powered route optimization • Live Google Maps integration". Below the headline, it says "Access Dashboard" and "Developed with full dedication by Muneeb Farid". It also mentions "Coding Assistance: Dawood". To the left of the main post, there is a sidebar with the user's profile picture and name "MUNEEB FARID", the title "ARTIFICIAL INTELLIGENCE ENGINEER", and the bio "Python Programmer/ Data Scientist /AI Developer /Machine Learning... Sahiwal, Punjab". Below the bio, there is a button "Try Premium for free" and a section for "Profile viewers" (107) with a link to "View all analytics". At the bottom of the post, there are interaction buttons for "Like", "Comment", "Repost", "Send", and "View analytics", along with a comment input field. On the right side of the screen, there is a sidebar with sections for "About", "Accessibility", "Help Center", "Privacy & Terms", "Ad Choices", "Advertising", "Business Services", "Get the LinkedIn app", and "More". There is also a "Messaging" button.

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.

