Delhi Metro Route & Usage Analysis

📌 Overview

This project analyzes Delhi Metro routes, trip patterns, and station distributions. It identifies high-traffic days, underserved areas, and correlations with urban density to improve understanding of metro usage and accessibility.

📁 Project Structure

bash

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```
├── part.ipynb     # Main Jupyter Notebook with metro route analysis
└── README.md      # Project documentation
```

📊 Dataset

The dataset contains details on metro routes and ridership trends, including:

- **Route details:** start and end points, route length, coverage area
- **Stations:** names, coordinates, and density by region
- **Ridership data:** trips by day, weekday/weekend comparison

(Dataset source not specified — can be added if available)

🛠️ Tools & Libraries

The analysis uses:

- **Python 3**
- **pandas** – data manipulation
- **numpy** – numerical operations
- **matplotlib** & **seaborn** – visualization
- *(Optional)* **geopandas** – geospatial mapping of routes

🔍 Analysis Highlights

The notebook covers:

- **Geographical Mapping** – plotting metro routes across Delhi
- **Ridership Analysis** – identifying peak usage days and patterns

- **Weekday vs Weekend Trends** – variation in travel volume
- **Station Density Mapping** – locating underserved areas
- **Urban Zone Correlation** – mapping routes to high-density regions

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📈 **Key Insights**

- Highest ridership occurs on weekdays, especially during peak office hours.
- Certain residential areas have limited metro access, indicating infrastructure gaps.
- High-density commercial zones are well-covered by existing routes.
- Potential expansion opportunities exist in underserved suburban areas.