**Ai – fusion**

**NYC TAXI TRIP DURATION & CONGESTION VISUALISATION**

**INTRODUCTION**

* The NYC taxi data set from Kaggle contains millions of taxi trips with details such as pick up or drop off coordinates and trip duration . The goal of this project is to built proof-of -concept to visualize congestion levels on NYC roads.

**OBJECTIVES**

* Predict trip durations
* Highlight congested roads on a map ( green -> low, orange->medium , red -> high )
* Provide an easy to understand demo for traffic congestion insights.

**DATASET DISCRIPTION**

* Source : NYC taxi trip duration (Kaggle)
* Main features :
* Pick up \_ date time -> starting time
* Pick up\_ longitude , pick up \_ latitude -> start location
* Drop off \_ longitude , Drop off \_latitude-> end location
* Trip \_ duration -> target

**TOOLS AND LIBRARIES**

* Python(main language )
* Pandas(data handling)
* Folium( map visualisation)
* Google collab , jupyter notebook ( execution)

**METHODOLOGY / WORK FLOW**

* Data loading and cleaning
* Exploratory data analyses :
* Analyse trip duration and pattern
* Feature engineering :
* Calculate speed , categorize congestion levels
* Visualisation:
* Use folium to plot routes in green , orange or red
* Output:

save interactive map as NYC\_congestion \_map.html

**RESULTS**

* The project successfully generates an interactive map showing taxi routes. Routes are coloured red ,orange ,green to represent congestion severity

**CONCLUSION**

This project demonstrates how big data and visualisation can be applied to urban mobility challenges . As a next step , integration with real -time traffic APIs such as google maps or HERE API .Can be explored.

**REFRENCES**

* NYC taxi dataset (Kaggle)
* Folium documentation
* Jupyter or collab environments