PUBLIC TRANSPORT OPTIMIZATION

- **PROBLEM DEFINITION:**

  The project evolves around integrating IOT sensors into public vehicles to monitor ridership, track locations, and predict arrival times. The goal is to provide real-time transit information to the public through a public platform enhancing the efficiency and quality of the public transportation services. This abstract introduces a study on the optimization of public transportation systems. Public transportation plays a vital role in urban mobility, offering an efficient and sustainable means of transportation. However, challenges such as congestion, delays, and inefficiencies persist in many urban areas. This research aims to address these issues by employing advanced data analytics and optimization techniques. By analyzing passenger demand patterns, traffic data, and operational factors, this study seeks to develop strategies that enhance public transportation networks' overall efficiency, reliability, and sustainability. The findings and recommendations from this research have the potential to significantly improve the quality of public transportation services, reduce environmental impacts, and enhance the overall urban transportation experience.

- **DESIGN THINKING:**

  HARDWARE SETUP:

  - Equip each public transportation vehicle with a GPS sensor capable of providing real-time location data.
  - Install an Arduino board on each vehicle connecting the GPS sensor to the Arduino board, ensuring proper communication.

  DATA PROCESSING WITH ARDUINO:

  - Develop Arduino code to interface with GPS sensor, retrieve location data, and time stamp it.
  - Program the Arduino for transmission.

  WIRELESS DATA TRANSMISSION:

  - Integrate an ESP8266 module with the Arduino to establish a Wi-Fi or cellular data connection and write the code to transmit the location data to the cloud server.

USER FRIENDLY INTERFACE:

- Design a user interface, such as a mobile app or web portal for passengers to access real-time vehicle locations and schedules.

TESTING AND OPTIMIZATION:

- Conduct extensive testing of the entire system, including hardware components, data transmission, cloud processing, and user interface.

SECURITY MEASURES:

- Implement security protocols to protect the integrity and privacy of the data, considering encryption and access controls.