**TECHNICAL REPORT:**

**Exploratory Data Analysis of Public Transport Patronage**

**Introduction:**

The objective of this technical report is to conduct an exploratory data analysis (EDA) of a dataset containing daily public transport patronage data. The dataset includes information on patronage using MyWay cards and paper tickets, excluding those purchased from Ticket Vending Machines and special event patronage.

**Data Overview:**

The dataset consists of 396 entries and includes three columns: 'Date', 'MyWay', and 'Paper Ticket'. Each entry represents a specific date and the corresponding counts of passenger boardings using MyWay cards and paper tickets. The data spans from April 1, 2023, to April 30, 2024.

**Exploratory Data Analysis:**

1.**Summary Statistics:**

•The average daily patronage for MyWay cards is approximately 48,325, with a standard deviation of 21,775. The average daily patronage for paper tickets is approximately 4,790, with a standard deviation of 2,541.

•The minimum and maximum counts for MyWay cards are 2,345 and 79,279, respectively. For paper tickets, the minimum and maximum counts are 373 and 10,154, respectively.

2.**Time Series Analysis:**

•Visual inspection of the time series plot reveals fluctuations in patronage over time. Further analysis is needed to identify any underlying trends or seasonal patterns.

3.**Ticket Type Comparison:**

•A scatter plot comparing MyWay card and paper ticket patronage shows varying levels of usage for each ticket type across different dates. MyWay card patronage appears to have higher variability compared to paper ticket patronage.

4.**Correlation Analysis:**

•The correlation matrix and heatmap indicate a positive correlation between MyWay card and paper ticket patronage, albeit with moderate strength. This suggests some level of dependence between the two variables.

**Insights and Recommendations:**

•The dataset provides valuable insights into public transport patronage trends, with potential applications in service planning, resource allocation, and marketing strategies.

•Further analysis is recommended to identify underlying patterns and drivers of patronage, such as seasonality, special events, and external factors like weather conditions.

•Predictive modeling techniques, such as time series forecasting or regression analysis, can be applied to forecast future patronage trends based on historical data.

•Continuous monitoring and analysis of patronage data are essential for adaptive decision-making and optimization of public transport services.

**Conclusion:**

In conclusion, the exploratory data analysis of the public transport patronage dataset provides valuable insights into passenger behaviour and usage patterns. By leveraging these insights, stakeholders can make informed decisions to enhance the efficiency and effectiveness of public transport services.