TASK:

INSIGHTS:

- There is a weekly pattern with higher patronage on weekdays and dips on weekends.
- Public transport patronage peaked in August 2019, with over 1.5 million passengers. This could be attributed to seasonal factors such as an increase in tourism, or special events in the city that led to more people relying on public transport.
- The lowest patronage occurred in September 2021, with just over 140,000 passengers. This drastic drop might be related to the ongoing effects of the COVID-19 pandemic, lockdown measures, or a reduction in public events or travel during that time.
- The Rapid Route service is the most popular, contributing 39% to the total patronage. This indicates a high demand for faster or more direct routes.
- The Peak Service accounts for only 0.6% of total patronage, suggesting that it might be underutilized compared to other services.

ALGORITHM:

Exponential Smoothing- the Holt-Winters Exponential Smoothing model

The Holt-Winters method is particularly suited for data with trend and seasonality, which are common in transport data. This method handles both additive and multiplicative seasonal effects and can account for changes in both the level and the trend over time.

The transport patronage data has seasonal effects (e.g., higher ridership on weekdays compared to weekends). Since the goal is to forecast patronage for the next 7 days (short-term forecasting), Exponential Smoothing is a suitable choice because of its ability to provide quick and reliable forecasts with minimal data preparation.

Parameters:

- trend = 'add'
  There is an additive trend (constant increase or decrease over time)
- seasonal = 'add'
  Due to additive seasonal effects (consistent seasonal pattern)
- seasonal_periods = 7
  Specifies weekly seasonality (7 days)
- forecast_days = 7
  Forecast for the next 7 days