**Google Data Analytics Professional Certificate – Capstone Project**

**Case Study: Cyclistic Bike-Share Analysis**

**PHASE 4: ANALYZE – Identify Patterns and Insights**

**Tools Used**

- Python (pandas, numpy)

**Actions Taken**

1. Loaded cleaned dataset (`cyclistic\_cleaned.csv`) into Python.

2. Converted `started\_at` and `ended\_at` to datetime objects.

3. Transformed `ride\_length` into numeric minutes for accurate calculations.

4. Added helper columns: `hour`, `month`, and `day\_of\_week`.

5. Performed descriptive analysis to compare casual riders and annual members.

**Key Insights**

Average Duration : Casual riders have longer rides on average compared to members.

Day of Week Trends : Casual riders are more active on weekends, while members ride consistently on weekdays.

Bike Type Preference : Members prefer classic bikes, casual riders use docked and electric bikes more frequently.

Monthly Trends : Summer months have the highest ridership for both groups, with casual usage peaking sharply.

**Output**

- Summary tables of ride duration, frequency by day, bike type usage, and monthly trends (used for Phase 5 visualizations).