DriveShare: Team 2

For the create\_tables scripts a new addition of audit table for the drivers status change has been added to complement the created audit trigger in the psm scripts.

Additional the psm’s UDFs has been created within the create\_tables for our workflow as the tables created along with the User-Defined Functions (UDFs) implementations handles essential calculations like geohash generation, distance measurement between coordinates, trip cost calculation, and state identification from geographical coordinates. These UDFs are leveraged throughout the database, particularly in computed columns for the tables.

The database schema includes tables for all major entities: Admin, RegisteredUsers, Renter, Driver, Rider, Car, Location, TripRequest, Invoice, and PaymentRequest, along with junction tables to manage relationships like Renter\_Car and Driver\_Car. Each table incorporates appropriate constraints with primary keys, foreign keys, check constraints, and unique constraints to maintain data integrity.

**Summary of PSM Script:**

The script contains several types of new database objects:

**Stored Procedures (4)**

1. **AssignDriverToTrip**
   * Assigns a driver to a pending trip request
   * Validates conditions: trip must be pending, driver must be available, and both must be in the same state
   * Updates trip status to "Ride-In-Process" and driver status to "In-Transit"
   * Updates driver location to pickup point
2. **CompleteTrip**
   * Marks a trip as completed
   * Generates an invoice automatically for the completed trip
   * Captures distance, price, and other trip details
3. **UpdateDriverRating**
   * Updates a driver's overall rating based on new rating input
   * Calculates weighted average of ratings
   * Updates total completed rides counter
   * Validates that ratings are between 0 and 5
4. **ProcessPayment**
   * Processes payments for trip invoices
   * Supports multiple payment methods: Cash, Card, OnlineWallet
   * Updates payment status to "Completed"

**Views (5)**

1. **vw\_RegisteredUsersWithAdmin**
   * Shows registered users along with their admin details
2. **vw\_AdminUserCount**
   * Displays the count of users managed by each admin
3. **vw\_ActiveDriversOverview**
   * Provides a detailed overview of active drivers
   * Includes name, license, availability status, ratings, location, etc.
4. **vw\_CarRentalPerformance**
   * Shows performance metrics for car rentals
   * Includes renter details, total cars rented, earnings, etc.
5. **vw\_PaymentInvoiceSummary**
   * Summarizes payment and invoice information
   * Links payments to invoices, trips, and riders

**Triggers (2)**

1. **TRG\_UpdateDriverLocation**
   * Updates timestamp when driver location changes
   * Ensures location tracking is current
2. **TRG\_Audit\_DriverStatusChange**
   * Creates audit records when driver status changes
   * Logs previous status, new status, and change timestamp
   * Tracks the history of driver availability changes

**Non-Clustered Indexing Scripts:**The script adds three targeted non-clustered indexes to optimize database performance:

1. **IX\_TripRequest\_Status\_State**: Speeds up filtering of trips by status and state, critical for driver assignment.
2. **IX\_Driver\_AvailabilityStatus**: Accelerates queries to find available drivers, particularly when sorted by rating.
3. **IX\_Location\_State\_City**: Improves geographic search performance by quickly filtering locations.

These indexes support core ride-sharing operations by reducing query time for common operations like finding nearby drivers, pending trips in specific areas, and location-based searches. The included columns allow these queries to be satisfied entirely from the index without accessing the base tables, significantly reducing I/O operations.

# **Ride-Sharing Application Analytics Summary:**

The reports provide critical business intelligence for the ride-sharing platform:

1. **Geographic Performance**: Can show earnings by city with and as show in the example Boston ($41K) as top performer, guiding market resource allocation.
2. **Driver Dashboard**: Helps in visualize driver status and distribution, enabling efficient driver management and availability tracking.
3. **Performance Correlation**: Illustrates relationship between completed rides and earnings, useful for driver incentive programs.
4. **Payment Analytics**: Breaks down trip status and payment methods, supporting financial forecasting.