MIDTERM: Databases - 2018/2019
Software Engineering Department, Computer Science Faculty, NRU HSE
Task Set C

Task 1. Entity-Relationship Modelling.
Car-sharing company offers country-wide short-term car rentals. Cars are of different models, seat counts and available baggage places count. Each car has built-in remote control and automatic geolocation reporting system. Each car in each moment may be in operational condition or under service. Customer must be registered before taking a car to rent. Customer mobile app must show a map with nearby cars in operational condition with corresponding fuel level. Customer may immediately reserve a car. Upon arriving to car location and reviewing car conditions, customer may agree to start a renal or to cancel reservation. Usage time and mileage data are sent by rented car every minute. When destination is reached, customer must place the car on a legal parking place, close it and finish the reservation using mobile app.
Draw an ER diagram for this domain.

Task 2. DDL. Build a relational database scheme for model from Task 1. (CREATE TABLEs).

Task 3. SQL. Find number of customers who reserved 'Bentley' in Moscow in current month, but reservation was cancelled.

Task 4. SQL. Find trip distance distribution (rounded up to 10 km) grouped by city of car rental.

Task 5. SQL. Find returning customers number in previous month grouped by city rental. Customer is returning in given month if her reservation history contains at least single earlier non-cancelled reservation.

Task 6. SQL. Find top 3 car models by total time of rental in last three days, counting only cars never been under service in these three days.

Task 7. SQL. Find all pairs of customers who at least twice rent the same car at the same day.
(Andy, KiaRio12, 01.10.18 10:00-12:00)
(Serge, KiaRio12, 01.10.18 15:00-15:45)
(Andy, Mercedes34, 10.10.18 01:00-02:00)
(Serge, Mercedes34, 10.10.18 05:00-05:45)