German University in Cairo in Berlin

Media Engineering and Technology

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Project Description (A)

"Vehicle Rental System"

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Rental motorcycle & scooter companies need to keep track of their vehicles'' locations and customers. A good database system is required to manage the rental process, maintenance activities, billing, and cost reporting. In this project you are required to design a database for managing such a small rental company.

Project Specification

The company has a large number of motorcycles and scooters. Each one has a particular brand, model, and class. A motorcycle or scooter can be owned or leased by the rental company. In case of an E-scooter, the battery level needs to be kept track of in order to be able to re-charge any empty scooter. A motorcycle, on the other hand, can either have a gasoline or diesel motor. Each motorcycle or scooter is equipped with a tracking system that reports data back which includes the current mileage and the GPS location of it. After the motorcycle or scooter drives a particular number of kilometers, it has to be sent for maintenance and inspection. At any point of time, a motorcycle or scooter can be either rented, in maintenance, or available.

The company needs to keep track of their customers. A new customer needs to provide their information (e.g. name, address, ssn, phone number(s), email) upon registering. They can also save information regarding different payment methods, like for example credit card info or online payment service (e.g., PayPal) to be used for payments afterwards.

In order to rent an available motorcycle or scooter, a customer has two options: either to specify a destination so that a time frame is calculated for them to rent the motorcycle or scooter or to specify a time frame throughout which they want to rent the specified vehicle. Each motorcycle or scooter has an associated hourly rental rate. After choosing an available vehicle, the customer has to decide for an *insurance scheme*. In case of renting a motorcycle, they need to provide proof of their ownership of a *driving license*. A vehicle can then be picked up from one of the rental company *locations* at which it is parked. Each location has many parking spots that are identified by a 4 digit number which can hold different vehicles at different times.

There are several types of insurances that can be selected by the customer: basic (included with the daily rate), advanced, and premium. The basic coverage covers only damages caused by the driver of the vehicle in case of an accident, but does not cover damages on the rental. Advanced covers accidents both caused by the driver as well as on the rental with a predefined liability amount (e.g., EUR 400). The premium covers all kinds of damages without a liability amount. Each insurance scheme has an associated daily rate that is separately charged to the customer.

The customer can also choose to rent extras like GPS or a helmet. Each of these extras have its own daily rate. The extras are delivered to the customer once he picks up the rental. During the pickup an employee of the rental car company checks the vehicle for existing damages, current mileage, and fuel/battery level.

Damages and accidents to the vehicle have to be documented. If a vehicle is damaged during a rental period, then it is sent to repair and a bill is issued to the insurance company and the customer depending on the preselected insurance scheme.

The company needs to keep track of each employee (name, email, hours per week, address). An employee can provide a gift-card to a customer with an amount to be redeemed in the next rental for the customer.