IV. DATABASE SCHEMA

Table Legend

Primary key – bolded

Foreign keys – italicized

> Class(attribute) - foreign key class connections

Table	Attributes
Member	***memberID*** *> SmartCard(memberID), Reservations(memberID), Account(memberID), Penalties(memberID), Billing(memberID), Payments(memberID)* firstName lastName address phone email driverLicenseNo status (Active, Suspended, Terminated)
MemberProfile	**profileID** *memberID > Member(memberID)* preferredVehicle *preferredLocation > VehicleLocation(locationID)* preferredPayment preferredCommunication webPassword
SmartCard	**SmartID** *memberID > Member(memberID)* smartPIN status (Active, Lost, Terminated) deposit
Reservations	**reservationNum** *memberID > Member(memberID)* *vehicleID > Vehicle(vehicleID)* startTime endTime status (Booked, Deleted, Complete) bookingType (Web, Phone)
Application	**applicationID** firstName lastName address phone

	emailAddress driverLicenseNo creditCardInfo insurancePolicyNo localityArea (Approved, Rejected) applicationFeePaid status (Pending, Approved, Rejected) *approval > Manager(approveApplication)*
Account	***memberID*** *> Member(memberID)* editAccount deleteAccount createUserAccount accountBalance
Manager	**managerID** *createUserAccount > Account (createUserAccount)* approveApplication denyApplication terminateUser
Penalties	**penaltyID** *memberID > Member(memberID)* reservationID > Reservation(reservationID) penaltyDescription penaltyDate
Billing	**billingID** *memberID > Member(memberID)* *tripID > Usage(tripID)* firstHour hourlyRate distanceRate
Usage	**tripID** *reservationID > Reservation(reservationID)* startTime endTime distance
VehicleInventory	**vehicleVIN** make model year vehicleType status (Available, Unavailable, Maintenance) *locationID > VehicleLocation(locationID)*
Payments	**paymentNum** *memberID > Member(memberID)* paymentDate paymentTotal paymentMethod (Credit Card, Debit Card)
VehicleLocation	***locationID > VehicleInventory(locationID)***

	locationAddress locationPinPoint

Part B

What is the difference between *systems analysis* and *systems design*? First discuss the aims of each of them (systems analysis and systems design) and how these aims are achieved. Then discuss how they are related to each other and how they are different from each other.

Systems analysis comes before systems design in the system design life cycle process. Systems analysis focuses on finding out and clarifying the requirements of the system. This phase asks, 'what do we want the system to do?" [1]. In the analysis phase, we want to establish what the client wants the system to accomplish and what kind of environment the system will need to work within. The client, or future users of the new system, have an important role in this phase. Developers must work closely with the users to ensure that the requirements are clear and that the client and developer's expectations are on the same page. Activities of the systems analysis phase include information gathering, defining requirements, prioritizing requirements, developing user-interface dialogs, and evaluating requirements with users [2].

Systems design is the next phase in the systems development life cycle, following analysis. The analysis phase determines what needs to be done, and the design phase determines how it will be accomplished. In this phase, the underlying architecture of the system is designed so that it meets the requirements outlined in the analysis phase [1]. The classes, objects, components, modules, and all parts of the system are created in this phase. Activities of systems design include describing the environment, designing the application components, designing the user interface, designing the database, and designing the software classes and methods [2].

Analysis and design are closely connected; without a thorough analysis phase, the requirements would not be clear enough for the developers to design the system components. They are distinct because the analysis phase is highly dependent on user input, use cases, and predicting issues or problems whereas the design phase is less user-dependent and focuses on designing the system so that it is ready for implementation.

References

[1] GeeksforGeeks, “Differences between System Analysis and System Design,” *GeeksforGeeks*, Dec. 18, 2022. https://www.geeksforgeeks.org/system-design/system-analysis-vs-system-design/

[2] J. W. Satzinger, R. B. Jackson, and S. D. Burd, Systems Analysis and Design in a Changing World, 7th ed. Boston, Ma: Cengage Learning, 2016.