COMP 361 – Assignment #4
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Part A: Relational Database Schema, Data Access Classes and Dialog Design

1 – Relational Database Schema

Table	Attributes
Application	**DateSent**
In-CarSystem	**TrackingSysID**, RefuelCardID
Member	**AccountNo**, FullName, FullAddress, PhoneNo, Balance
MonthlyBill	**Date**, *AccountNo*, Amount, DueDate
Payment	**PaymentID**, *AccountNo*, Amount, Date
Reservation	**ReservationID**, *AccountNo*, Date, TimeStart, ExpectedTimeEnd
Trip	**TripID**, *AccountNo*, *TrackingSysID*, *VehicleNo*, PickUpTime, DropOffTime, TotalKms
Vehicle	**VehicleNo**, Make, Model, Year, ParkingLocation
VehicleMaintenance	**KeyID**, *VehicleNo*, ServiceDate, TidinessCheckDate

2 – Data Access Classes for "Make Reservation Through Web Interface" Use Case

For the diagram, please see the file "DAClasses.jpg".

3 – Top 2 Levels of Menu Hierarchy

Reservations
Make New Reservation
Update Reservation
Cancel Reservation

Member Account Management
Send Application
Update Member Account
Submit Fuel Receipt

Billing
Adjust Member Charges
Add Newsletter
Add Seasonal Notification

Vehicles
Add New Vehicle
Remove Vehicle
Update Parking Location

Vehicle Maintenance
Perform Tidiness Check
Perform Service Check

Reporting and Queries
- Membership Report
- Preference Trends Report
- Vehicle Usage and Availability Report
- Reservation Patterns Report
- *Trip Statistics Report*

Part B: Essay Question

A relational database stores information in tables, and data in each table is related to other tables through the use of primary keys and foreign keys. One of the biggest advantages of relational databases is their familiarity and ubiquitous implementation. This means the standards developed for using and implementing relational databases are well designed and tested through years of use. However, they are not well adapted to object-oriented programming and design. As a result, they should only be used when the system being implemented is based on an existing system using a relational database. And only then when there are no major changes to the database that need to be made.

An object-oriented database is quite different. It stores objects instead of tables, and it works much better with object oriented programming and design. Yet object-oriented databases are not as widespread as relational databases. Furthermore, few standards exist that are widely used in the industry and database designers may require training. Nevertheless, object-oriented databases should be used as often as possible. Especially so if a new system is being designed from the ground up. This will allow the database model to adapt to future trends in the industry.

Finally, a hybrid database is a combination of the relational and object-oriented types. This allows for object-oriented design techniques to be implemented using a relational database. While class methods are not directly stored in the database, many more relationship and data types can be represented when compared to a relational database. However, it can be more difficult to design this type of database because a designer must solve the problem of reconciling the two types. This type of database should be used when a relational database is already in place, but a new system is needing development with object-oriented techniques.

Part C: Reflection

I haven't received my marks from the last assignment, so I can't see how well I did. But I can see why this assignment is only worth ten percent of our mark, while the others were worth much more. This assignment was much easier than the first three. However, I still found

some difficulties when completing Part A.

I found that designing the data access classes was much harder than I thought. This is because I didn't know what exactly was required in representing them. I ended up making a diagram just like the one in the textbook because that was the reference presented in the question. I feel that the language is a bit unclear here, and the expectations are unclear, much like I had issues with design class diagram portion of the previous assignment.

The thing I always do when questions are unclear to me like this is usually ask my tutor to clarify, and search the forums (as well as blogs in this case). Unfortunately, I didn't have time to wait for an email response, so I checked the forums and such for help. I didn't really get my question answered, but reading through the answers always gives me insights into other parts of the assignment that I hadn't thought of. I know this is assignment number four already, but I want to state clearly, that using the forums and blogs are probably the first step you should take when beginning your assignment. It will get your mind running.

Moving on, I found making the relational database schema to be quite easy for this assignment. I have done something similar in a previous course, so it felt natural to do. Everyone brings their own experience and skills to the table, so make sure you use what you can to do well not just on the assignments, but for the whole course. I'm still not sure if I did this part right though! I guess I will have to wait and see like always...

Good luck on Assignment 4!