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**Final Report**

This project was a very interesting experience. It gave me an idea of what businesses look for when designing a database. The design of a database with telephone records became more of a challenge than I initially anticipated. The most difficult part of the project was readjusting tables after it was designed. Sometimes, I would have to readjust multiple relationships after modifying one table. It was important to solidify the diagram as much as possible before creating the tables. Discussions of what to record was quite a task. Obviously, records of telephone numbers and names were essential but phones, especially in this day in age, consist of so much more - text messages, voice mail, data plans, the amount of people on that plan, the primary phone number, etc. These were tables that needed to be constructed and placed in the Boyce Codd Normal form. However, there is one table, which is called “Permanent Records” that was intentionally not normalized. The purpose of the table was to record the exact information of someone who had a phone associated with an ID and record at that exact point in time. If a person ever changed their number or name, the information in permanent records would never update - only append. The idea behind this table is primarily for legal cases. If a client is to ever send threatening text messages or make threatening calls, that information is permanently recorded. Even if that person deletes their messages from their phone or change their name or number, the database would be able to supply any investigative evidence to the state if required.

The primary key of the Permanent Records table consists of the ID, phone number, and sign-up date. The phone numbers can be reused by other clients but the ID will never change. Even if the client were to change their name in the system and then drop the service, the information on the date the client initially registered will still consist of the client’s initial registered name.

While the database design was very interesting and difficult, writing queries with SQL was the most important thing I learned while doing this project. I learned the importance and popularity of the language is because everything uses a database since data is constantly being transferred and updated. It also reinforced the importance of establishing a well-designed database. It helps with simplifying queries and allows accessing data a lot easier. As previously mentioned, one of those designs include normalizing a table - specifically, the Boyce Codd Normal form. This allows tables to be easily distinguishable using unique and unrepeated keys. It also allows for data to be easily updated since it reduces the amount of repeated attributes of tables.

The Boyce Codd Normal form was probably the main reason why the database design took a lot of time. After may redesigns of the tables as well as adding and taking away attributes, normalizing the database extended the time for the design process. This was probably the best kind of practice I had in the entire process. Once the database is designed, the SQL becomes quite simple.

The only suggestion I have with Oracle SQL is providing better instructions for software setup or finding an easier software to use that can easily turn your own computer into a database. I was able to eventually set up Oracle correctly where I was able to write queries, but it seemed like an unnecessary struggle. Overall, it was a very useful project and I now have SQL listed on my resume as languages I know.