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Databases & Data Modeling

Assignment 01

**Databases**

**Introduction**

In this assignment, I will be discussing the principles of database design. These concepts are the foundations of building a database that is functional and optimal for users. Some of these fundamental concepts include normalization, relational databases, and primary keys.

**Databases**

The purpose of a database is to store data in an optimized fashion. The database should be organized in a logical sense so that the data is easily accessible and information can be gathered and analyzed. One example of database usage in my everyday life is Netflix. Netflix is a database that stores movies and TV shows and streams them to their consumers.

**Relational Databases vs. Paper Based Systems**

A relational database design is beneficial because it allows for consumption of massive amounts of data. In addition, relational databases allow for efficient trend analysis. Compared to a paper based system which has the benefits of being cost effective and easy to establish. However, there are many downsides to paper based databases. Some of which include the difficulty of querying information, the vulnerability, and scalability issues.

**Normalization**

Normalization is the process of reducing data redundancy and improving data integrity. By organizing the data in a normalized form it simplifies the database to its optimal structure, thereby making the user experience more friendly. This process allows for data to be easily updated when new information is discovered. By reducing redundancy each record is only in the database once and only needs to be updated in one place. Additionally, minimizing redundancy decreases the amount of data stored and doesn’t waste space with repeated data.

**“The Key, The Whole Key, and Nothing but The Key”**

The phrase “The Key, The Whole Key, and Nothing but The Key” references the primary key. This statement refers to the fact that all columns in a table must directly relate to the primary key. If the column does not rely on the primary key it should not be included in this table and should be placed somewhere else in the database to follow the rules of normalization.

**Associative Entities**

An associative entity is a table that bridges the gaps between two tables that have a ‘many to many’ relationship. This table contains both primary keys in order to map the two tables together. An example of this would be in a university registrar. They would have many students who take multiple classes and classes that contain many students. The school would have to have an associative entity in which to keep track of all the students and the classes.

**Summary**

Database design is a crucial part of any business operation as most couldn’t function day to day without some sort of functional database. Through this assignment I have come to appreciate databases more and seen there many uses that I hadn’t thought about before.