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1/30/2024

Lab 2

Explain the distinctions among the terms primary key, candidate key, and superkey.

In a table there can only be one primary key present, the value is not able to be null and it is the leader of the candidate keys. The primary key's value must be unique at all times, a very common example of a primary key is an ID number.

A candidate key is an option in the table to become a primary key, the values in the table that can't be null can be classified as candidate keys. All of the candidate keys that are not the primary key can be classed "alternate keys." It is up to the developer of the database to select what candidate key becomes the primary key.

A superkey is a combination of fields in a table, all the values must be unique and not null. An example of a superkey can be first name and last name combined. There is no limit on how many candidate keys can be selected in the super key.

Write a short essay on data types. Select a topic for which you might create a table. Name the table and list its Fields (columns). For each Field, give its data type and whether or not it is nullable.

A simple topic where a table could realistically be used in a real world setting is an employee roster for a company. The table could be named "Employee" and it could have eight fields. The primary key I would use is for the first field, which would be named "EmployeeID" ; it would be an integer and would not be nullable. The next two fields would be named "FirstName" and "LastName." These would be varchar data types and not nullable. A nullable field similar to the last two could be "MiddleName." It would be a char data type but nullable because not everyone has a middle name. A date data type could be used for the "DateOfBirth" field, it would be non-nullable. Another data type that would be a varchar would be a phone number, some people in the modern age don't have phone numbers or it may not be required by the company

to provide the information so it could be classed as nullable. The last field would be decimal, for the salary of the employee. This value would be non-nullable as a salary is required to work at most companies.

Explain the following relational "rules" with examples and reasons why they are important.

a. The "first normal form" rule

- All fields and columns must have atomic values meaning that there cannot be multiple values inside the data. An example of this can be having first name and last name inside of one data type instead of splitting them. This rule is important because it simplifies and makes the database easier to understand and read.

b. The "access rows by content only" rule

- The only way to access information is by searching for what is in the table, not where it is in the table. The information should only be retrieved because of the data that is contained inside of the row. An example of this is using a primary key to access information about something, such as using a employeID to locate the name of an employee. This rule is important because it can ensure that data is easy to be edited without affecting how you can access the data.

c. The "all rows must be unique" rule

- All rows in the table must be unique and there should be no duplicates in the table in the same row. An easy way to enforce this is to use a primary key where there are no nulls and the data must be unique upon every entry. An example would be using an ID as a primary key for the row of data. This is important because it means that the data in the table is accurate and it is correct.