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Database Management
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Lab 2: CAP Database

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

   A primary key is a special relational database table column (or combination of columns) designated to uniquely identify all table records (rows). A primary key must contain a unique value for each row of data and cannot contain null values. A candidate key is a column, or set of columns, in a table that can uniquely identify any database record without referring to any other data. Each table may have one or more candidate keys, but one candidate key is special, the primary key. A superkey is a combination of columns that uniquely identifies any row within a relational database management system (RDBMS) table.

2. Select a topic for which you might create a table. Name the table and lists its field (columns). For each field, give its data type and whether or not it is nullable.

   There could be a table specifically for Friends (a television show). The fields could be season, episode, episode title and air date. So for example it would look something like this:

Season	Episode	Title	Year
4	1	The One with the Jellyfish	1997
4	2	The One with the Cat	1997
4	3	The One with the Cuffs	1997
4	4	The One with the Ballroom Dancing	1997
4	5	The One with the Dirty Girl	1997

   The fields season and episode would consist of integers, while title consists of words, and the date would consist of a numerical date. The fields would only be nullable if the data field was unknown but the information should be consistent throughout and should leave no field null.

3. Explain the following relational “rules” with examples and reasons why they are important.
    a. The “first normal form” rule
        i. All “fields,” the intersection of a row and column, are atomic, meaning that the field possess the smallest possible unit so that field needs no internal structure. For example the value would be a single integer rather than a birthdate that requires a structure for the month, day, and year.
    b. The “access rows by content only” rule
        i. Data is accessed by what rather than where because the order of the rows and columns are immaterial, the sets contain no order and tables are made of sets. If you are locating a certain data you would reference that it is an ‘episode’ ‘4’ not column 3, row 4.
    c. The “all rows must be unique” rule
        i. This last relational rule is a natural consequence of set theory because of the uniqueness that is mandated for the existence of a primary key. This means that one field in a row is unique to insure there are no duplicates, hence the ability to locate a data field.