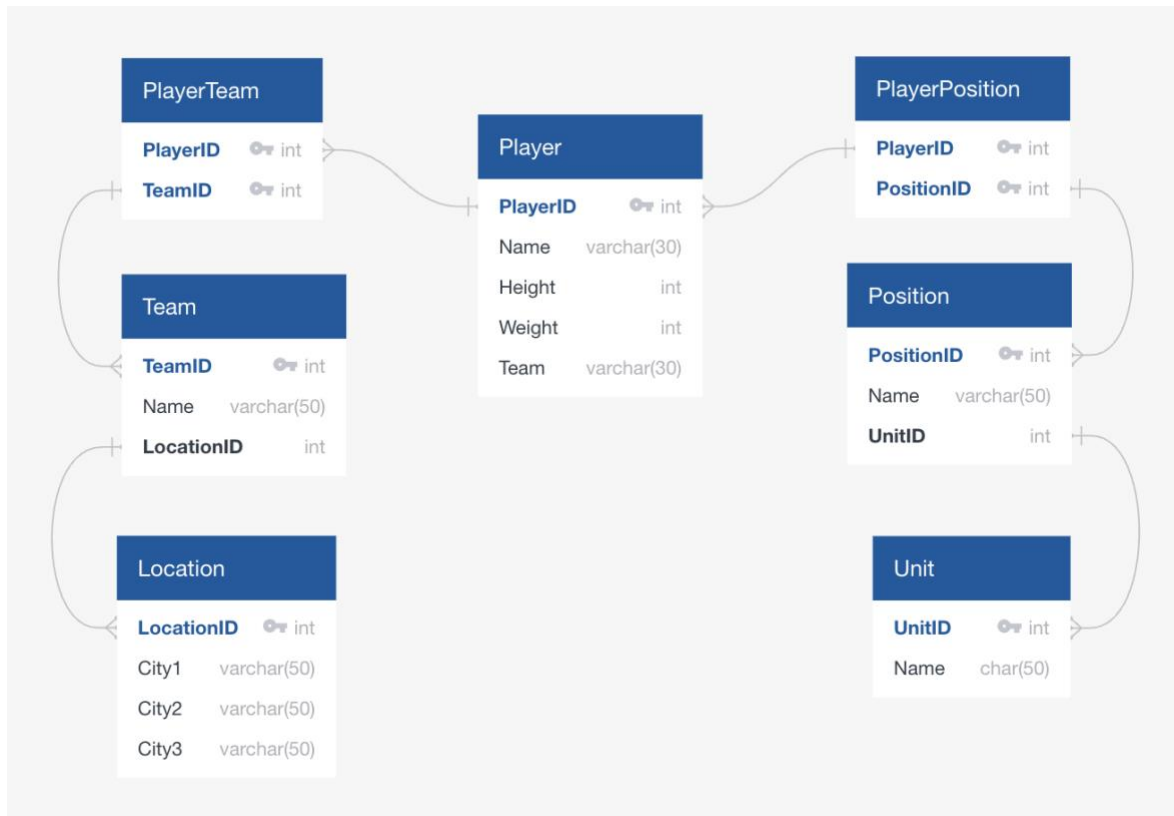


Database Design Assignment 1

A database is defined as an organized collection of data. The basic concept behind databases is to find clear ways to sort data so it can be more clearly be analyzed and understood. While there are many kinds of databases, we are going to primarily focus on the idea of relational databases. In this type of database, there are relations in the data with primary and foreign keys represented in tables. A relational database might be seen in a system that is actively updating, such as receiving customer information when they make a purchase.

There are a few problems with relational databases though. One of the primary problems that is seen with this type of database is the many-to-many problem where there are too many repeating keys that would be represented leading to bulky, redundant data. This can be solved using a bridge table, where both primary keys from each table that are to be combined are the compound keys for the new table. Another problem that is seen is a lack of consistency in the data. This is where normalization is brought in. Using normalization you remove repeating groups, remove redundancy, and ensure all the data belongs under the right key. For example, if a table is labeled “Student”, you would not want to include a key mentioning the city of the school the student attends. It is also important to note the importance of Camel Case and atomic data. Camel Case is used to ensure that the first letter of each word of a key is uppercase. Atomic data is used to break up data into its most basic parts. For example, instead of “StudentName”, you may instead do “FirstName”, “LastName” to ensure the data cannot be accidentally misinterpreted. Before showing a completed database, I will show a database with many problems which would be considered bad practice. This is shown below:



I have created an example database for this assignment going over football players at Ferris State University. Here, I created separate tables for “Player”, “Team”, “Location”, “Unit”, and “Position” while also creating bridge tables for “PlayerPosition” and “PlayerTeam”. This database can be used to accurately note a player, their football position and what unit they are on the team while also including what team they are on and where the team is located. The database can be seen below:



The standards for this database are listed here:

Naming: table names are in lower case and the first character of each word is in UPPER case.

There are no spaces between words. This is often referred to as camel case. For example:

EmployeeInfo. Column names are in lower case and the first character of each word is in UPPER case. There are no spaces between words. For example: EmployeeId.

Data types: Proper data types are important for good performance. The following guidelines apply to this class: 1) no use of image or complex data types without prior approval of the instructor. 2) data types in table definitions must correspond with data types in SQL routines and stored procedures.

Columns: Columns must not have multiple fields in a single column (i.e. first name and last name should be separate fields - atomic).

Indexes: No more than 3 indexes per table in an OLTP (transactional database). More than 3 indexes per table are allowed in an OLAP (decision support) environment.

Referential Integrity: Referential Integrity should be enforced by the database definition (constraints &/or triggers), not in Queries.