Student Management System Database Design

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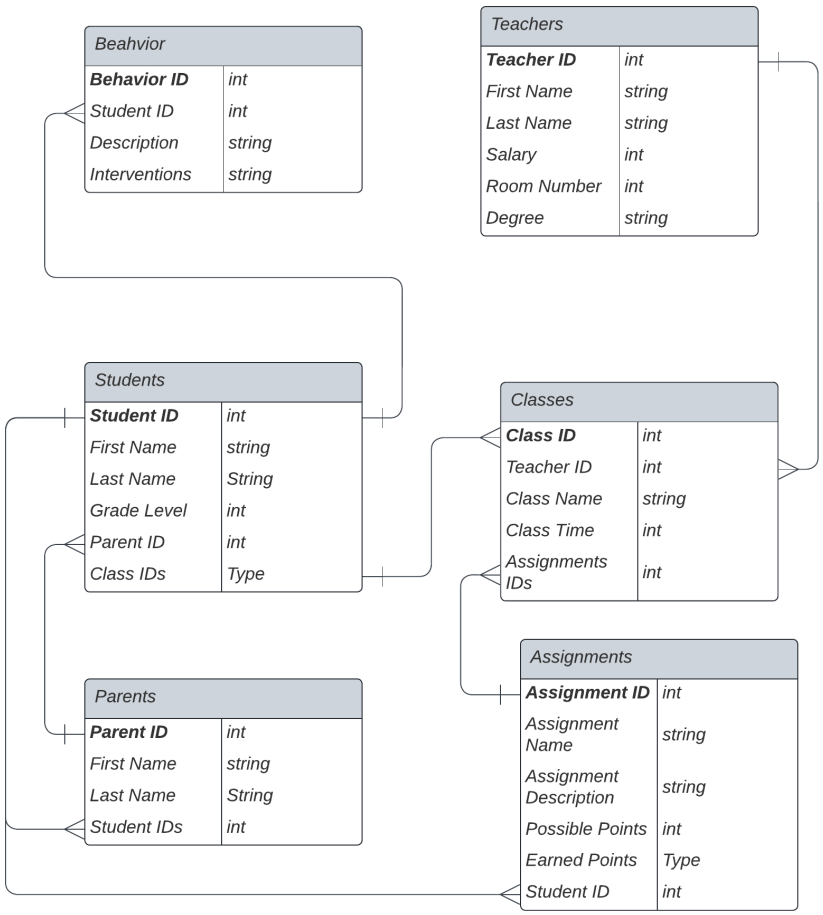
Overview

I am going to use PostgreSQL- a relational database. The data I am using is highly regular and has inherent relationships. Thus, I found it would be easiest and most efficient to use a relational database. Data will be queried and linked to multiple tables to gather all of the necessary data. For example, data will have to be linked between the students and classes tables to print out the student schedule. And data will have to be accessed using the teachers, classes, and student tables to update a student grade within the class.



Teachers

Purpose: The teachers table will store all relevant information about the teachers and administrators working at the school. Such as their name, ID, level of education, and class room number.

Implementation: This table will be used behind the scenes of the app to connect the appropriate teacher with the classes in which they teach.

Interaction: Teachers will have view only access to their own data. Administrators will have view only access to all teachers within the building. Only HR can write the data to this table if changes need to be made.

Relationships: The teachers table has a one-to-many relationship with the classes table. One teacher can teach many classes.

Students

Purpose: The student table stores all relevant student data. It will allow for student schedules to be created and grades to be received. It will also link a student to the appropriate parent account.

Implementation: This data will be viewable in a student information page (when a user clicks on a student name).

Interaction: Teachers, administrators, students, and parents will have view only access to this data on the student page. Only the registrar can change student information.

Relationships: The students table has a one-to-many relationship with the parents table, behavior table, and student schedules table. Students can have multiple parents, multiple behavior referrals, and take more than one class.

Parents

Purpose: Stores basic information for parents and allows each parent user to access the appropriate student data.

Implementation: Information will be viewable on the student information page (accessed by clicking on student name). It will be placed under the student information for easy access by teachers and administrators.

Interaction: Teachers, administrators, students, and parents will have view only access to this data on the student page. Only the registrar can change parent information.

Relationships: The parents table has a many-to-many relationship with the students table. There is potential that more than one parent has more than one child that attends the school.

Behavior

Purpose: This table will record all behavioral referrals submitted by teachers and administrators.

Implementation: Information will be viewable on the behavior page of the web app. Students and parents will only be able to view their own referrals while teachers and administrators will be able to view all student behavior referrals.

Interaction: Students and parents will have view only access to their individual behavior referral data. Teachers and administrators will have read and write access to the referral page. Both teachers and administrators can input new referrals for students and review previous referrals.

Relationships: The referral table has a one-to-many relationship with the students table. One student can have many referrals. But, referrals must be entered individually for students. One referral cannot be associated with multiple students.

Assignments

Purpose: This table lists all assignments and records the points that students earn.

Implementation: Students will be able to view all assignments on the assignments tab. They will also be able to filter their assignments per class. These assignments, including possible and earned points, will be displayed to students and parents.

Interaction: Teachers and administrators will need read and write access to record and edit grades. As well as creating and removing assignments. Parents and students will have view only access- to view their grades and check on assignments progress.

Relationships: This table has a many-to-many relationship with both the students table and the classes table. All of the students take multiple classes, meaning they have multiple listings in the assignments table. And, similarly, all of the classes have more than one assignment at a single time.

Classes

Purpose: This table stores all important information for a class offered at the school. The class name, time, and the teacher who teaches the class. This table stores all information about a class to be used in student schedules.

Implementation: Class information will be shown on the student information page (accessed by clicking on a student's name). The student schedule will display the class time, the class name,

and the teacher of the class- informing the student where to go for the class and what will be taught.

Interaction: Teachers, administrators, students, and parents will have view only access to this data on the student page. Only the registrar can change student schedule information.

Relationships: The classes table has a one-to-many relationship with teachers. One teacher can teach many classes. The classes table will, again, have a many-to-many relationship with the students schedule table. Many students take multiple different classes.