

Database Documentation

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1. General Description

The `borjamoll` database is designed to manage data about students, teachers, companies, and employees within an assignment system. The purpose of the system is to facilitate the assignment of each student to both a teacher and a company employee, allowing supervision from both educational and corporate perspectives. The design includes relationships where:

- Teachers can supervise multiple students.
- Employees, who work for specific companies, can also supervise multiple students.

2. Database Structure

The database consists of four main tables (**Teacher**, **Company**, **Employee**, and **Student**) with specific relationships and foreign key constraints to ensure data integrity.

2.1 Teacher Table

The **Teacher** table stores information about the teachers who supervise students. Each teacher has a unique identifier, a name, a surname, and an email address. This table is related to the **Student** table, where each student is assigned to one teacher, but a teacher can supervise multiple students.

2.2 Company Table

The **Company** table holds data about the companies that employ the employees who supervise students. Each company has a unique identifier, a name, and a contact email. This table is linked to the **Employee** table, where each employee is assigned to one company, though each company can have multiple employees.

2.3 Employee Table

The **Employee** table contains information on employees who work for companies and may supervise students. Each employee has a unique identifier, a first name, a surname, an email, a phone number, and a reference to a company. The **company_id** field is a foreign key linked to the **Company** table, establishing a one-to-many relationship where one company can have multiple employees.

The **Employee** table also links to the **Student** table via a foreign key, as each student is supervised by an employee. However, an employee can supervise multiple students.

2.4 Student Table

The **Student** table includes details on students, who are assigned both a teacher and a company employee. Each student has a unique identifier, a name, a surname, an email, a phone number, and foreign keys referencing the **Teacher** and **Employee** tables. These foreign keys establish relationships that allow each student to be linked to one teacher and one employee, while allowing teachers and employees to supervise multiple students.

3. Data Insertions

Several records were inserted into each table to populate the database with meaningful data and to allow for comprehensive testing of various queries.

3.1 Teachers

Teachers were added with unique identifiers and assigned names, surnames, and emails. This data allows for creating associations with students.

3.2 Companies

Companies were added with unique identifiers, names, and email addresses. The data allows for linking employees to specific companies.

3.3 Employees

Employees were added with identifiers, names, emails, phone numbers (some of which are `NULL` to test optional data handling), and company assignments. Each employee is associated with a company and can be assigned to supervise multiple students.

3.4 Students

Students were added with identifiers, names, emails, phone numbers, teacher assignments, and employee assignments. One student was assigned specifically to have both `teacher_id = 1` and `employee_id = 2` to test queries where both criteria are specified.

4. Sample Queries

Several queries were developed to retrieve data from the `borjamoll` database:

- **Querying Students by Teacher and Employee:** Retrieves students assigned to a specific teacher and employee.
- **Listing Students with their Teachers:** Joins the `Student` and `Teacher` tables to display each student alongside their supervising teacher.
- **Retrieving Employees with Their Company:** Lists employees and their associated companies using a join on the `company_id` field.
- **Counting Students per Teacher:** Calculates the number of students supervised by each teacher.

These sample queries provide insight into data relationships and allow testing of the database structure.

5. Considerations and Testing

The `borjamoll` database was designed with foreign key constraints to ensure data integrity, such as linking students to valid teachers and employees, and employees to valid companies. Various data points, including `NULL` values for some fields like phone numbers, were included to test the handling of optional data.

The database was also populated with specific data points to test complex queries, ensuring that results are returned as expected and allowing for various types of analyses, such as calculating the number of students per teacher or retrieving students assigned to specific supervisors.