COEN 122 Project Description

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Greenfield’s Rental Management Database System Overview

Greenfield’s Rental Management Inc. is looking to begin a rental management business. As a result, they need a database that will be able to store all of their data and enforced specific constraints. As a result, the team made up of Greg Cusack and Sam Kujovich propose a band new database system that will hold and organize all of Greenfield’s data, while also enforcing constraints laid out by the company. The system is designed as follows:

Greenfield’s has multiple branches, and at each branch, they employ multiple employees. These employees fall into one of three categories: manager, supervisor, or staff. Note that each branch has a branch identification number (branchId), a phone number (phone), and an address (street, city, zip). The branchId number is the primary key; and therefore, can uniquely identify each branch. Furthermore, each employee is employed at only one branch and has the following characteristics. First, each employee has an employee identification number (empId), a branchId number corresponding to the branch in which the employee works, a name (name), a phone number (phone), a start date (startDate), and a job (job) which must be either a manager, supervisor, or staff. Also, each branch only has one branch manager. The empId is the primary key, while the branchId is the foreign key that references the branchId from the Branch table.

Greenfield’s Rental Management Inc. is a rental property company, so the system needs a table that contains each rental property. Now, each rental property has a property owner and a property supervisor. However, the a property supervisor can only supervise, at most, three rental properties. The property owners are independent, while the property supervisors are employed by Greenfield. Each property has the following characteristics. First, a rental property has a property number (propNum), which uniquely identifies the property. A property also has an owner identification number (ownerId), an address (street, city, zip), the total number of rooms (rooms), the monthly rent (rent), the availability status (status), which must be either Available or Not-Available, an availability date (availDate), which identifies on which date the property is available for rent, and finally an empId, which corresponds to the Greenfield supervisor who oversees the rental property. The empId is a foreign key which references the empId in the employee Employee table. The ownerId is the other foreign key in the RentalProperty table, and it references the primary key in the PropertyOwner table.

The PropertyOwner table contains all of the property owners that are using Greenfield to rent their property. Each property owner has an ownerId, which uniquely identifies a property owner. An owner also has a name (name), a phone (phone), an address (city, state, zip), and a fee (Fee). Now, this Fee is a $400 fee that is charged to the property owner for every property he or she lists using Greenfield.

The last table that is required for a proper rental management database is the LeaseAgreement table. A lease agreement is created whenever a rental property is rented by someone. The agreement contains the propNum which references the propNum in the RentalProperty table. The agreement also contains the deposit amount (deposit), which corresponds to one month’s rent, the name of the person renting the house (name), the person’s home and work phone (homePhone, workPhone), a personal contact (conName, conPhone), the rental price (rent), and the lease term (startDate, endDate). One of the constraints of the lease agreement is that the full duration of a lease must be between 6 months and 12 months. However, if the lease is only 6 months, the rent is 10% higher than the normal rent. Furthermore, for every new lease on a property, the rent is increased by 10%. The primary key in the LeaseAgreement table is both the propNum and the startDate. These two attributes are used together to distinguish rentals of the same property at different periods of time.

Through the above requirements and constraints laid out by Greenfield’s Rental Management Inc., Cusack and Kujovich have designed and built a rental management system that will allow Greenfield’s to run a proper and organized business.

With each database system, an entity relationship diagram (ERD) needs to be design in order to truly understand and visualize the database before implementation. The two ERDs used for the database are attached on the last page. Furthermore, in order to ensure the the ERD is correct, the functional dependencies need to be identified. The functional dependencies are as follows:

Branch Table

FDs:

branchId → phone, street, city, zip

Employee Table

FDs:

empId → branchId, name, phone, startDate, job

Rental Property Table

FDs:

propNum → branchId, ownerId, startDate, rooms, street, city, zip, status, empId, rent

Lease Agreement Table

FDs:

propNum, startDate → name, homePhone, workPhone, conName, conNumber, endDate, deposit

Property Owner Table

FDs:

ownerId → name, phone, street, city, zip, fee

All FDs are in BCNF; therefore, all FDs are normalized.



Figure 1. Crow’s Foot Entity Relationship Diagram



Figure 2. Entity Relationship Diagram with the Book’s Notation