Each entity has four functions. Add a tuple, edit a tuple, delete a tuple, and query tuples of this entity. This document is a list of if-then statements for the designer of the database to implement so that the rules and constraints of the design can be enforced while providing a productive experience for the user.

**Creation**

When creating a new staff member or client if the user enters an email address already in the system then it will return an error: person already exists in database.

When creating a new property the street address and city must not be a duplicate of something already in the database or it will return an error: property already exists in the database.

When creating a branch the location must not already exist in the database or it will return an error: branch already in database.

When creating a new property the location and listing data fields must be populated: Error lack of required fields.

Immediately after property is created all three of the relationships must be done at that time (who is the owner, what branch is handling it, who is the listing agent) or the database will not save the new property: Error incomplete application.

When creating a new staffmember the contact information must be entirely populated: Error lack of required fields.

Immediately after a staffmember is created the relationship with the branch must be defined or it will not save the new staffmember: error incomplete application.

When creating a branch the location field must be populated: Error lack of required fields

When creating a new client the contact information and client type (just owner, buyer, renter not all the sub fields beneath those) must be populated: Error Lack or require fields

Upon successfully creating a new client/staffmember/owner/property the system will automatically populate a unique ID for it.

The first character of an ID is a letter to indicate what type of ID it is.

E = staffmember/employee

C = client

P = property

B = branch

After the letter will be a unique sequence of numbers.

**Queries**

\*Note in all queries in order to search an entity by relationship the ID number of the related entity will be necessary.\*

To search propertys

The user will be asked to populate these fields

PropertyID

Listing agent

Owner

Branch

Location

Street

City

zipcode

Listing data

List date

Listing type

Sale

Rent

Price (range)

Property statistics

Number bathrooms (greater than or equal to)

Number bedrooms (greater than or equal to)

Square footage (greater than or equal to)

Type of property

House

Condo

Commercial

Apartment

The database will throw an error if the location field is NOT filled out. (the city OR zipcode are required)

The database will throw an error if the user does not specify sale or rent.

In all other fields if the user inputs nothing it will return everything.

To search clients (only bank employees will be allowed to do this)

The user will be prompted with

ClientID

Property

Branch

Contact info

Email

Name (first last)

Client type

Owner

Owner type (

Buyer

Price (range)

Location

Amenities

Renter

Rental contract

If none of the fields are populated it will list all the clients in the database. For each field that it populated it will list tuples matching attributes/relationships.

To search branches

The user will be prompted with

BranchID

Client

Property

Staffmember

Location

If no fields are populated then it will output all the branches. For each field populated it will only show tuples with matching attributes/relationships.

To search staffmembers (only bank employees should get to do this) the user will be prompted with.

StaffID

Branch

Property

Contact info

If no fields are populated then it will output all the staffmembers. For each field populated it will only show tuples with matching attributes/relationships.

**Editing**

Step 1: Find the tuple in a search

Forbidden edits

Relationships can be altered (a property is now handled by a different branch), but they cannot be removed (a property suddenly has no owner relationship).

The user cannot edit the unique ID key that is not accessible.

The user cannot change entity attributes to duplicate an entity already in the database.

When editing a new staff member or client if the user enters an email address already in the system then it will return an error: person already exists in database.

When editing a new property the street address and city must not be a duplicate of something already in the database or it will return an error: property already exists in the database.

The property location attribute cannot be changed. (buildings are stuck in one place)

**Deletion**

Step one: find the entity with a query.

For property

Property has no other entity dependent on it so its deletion is easy. The tuple is removed from the database and all attendant relationships are removed.

Staffmember is similar with one exception if the staffmember was the listing agent on a property then a new staffmember must fulfil this relationship (all property has a listing agent).

Client (our bank doesn’t lose clients. In fact we don’t lose PERIOD) in the rare instance of client death then all property in a relationship with a client must also be deleted. (all property must have an owner)

Branch this is the hardest of all being that staffmembers, clients, and properties all must have a relationship with a branch. When deleting a branch the user will be prompted to create new relationships for all the relevant staffmember/clients/properties or failing that delete the now unrelated entities as well.