Database Theory and Design

Assignment part-1 Project Fall 2014

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FIRST DATA PROPERTIES

Constraints / Business Rules

* We deal with only residential properties and no commercial properties.
* We help in selling, buying and leasing houses to our clients.
* For renters, after they have agreed on the house to lease, we maintain the leasing agreement details.
* Both buyer and renter will have preferences like location, size of the house, number of bathroom/bedroom and budget (price range). So, there is a separate table ‘client choice’ for these details.
* Each branch has a manager.
* Each staff is associated with a branch and their payroll is also maintained in database.
* Property details include its type, availability, associated staff, features, listed price, advertisements and inspections done.

The below parts of the assignment can be found in following pages in the same order:

* Entity-relationship diagram for this real-estate database
* Entity-attributes diagram
* Relational schema diagram
* Relational schema definition
* Domain of the attributes – definition
* Group meeting log

ENTITY-RELATIONSHIP DIAGRAM



Every property is associated with one branch. (Total participation)

Each staff is associated with one branch. (Total participation)

Every tuple in payroll will have one staff and reverse is also true, so it is one-to-one relationship.

Every property will have one client (owner) at all time.

Advertisement or property Inspection will have only when there is a property.

ENTITY-ATTRIBUTE DIAGRAM

Branches



STAFF

Payroll



Clients



Client Choice



Renters



Properties



Advertisement and inspection schedule



**RELATIONAL SCHEMA DIAGRAM – FIRST DATA PROPERTIES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Branches | branch\_id | manager\_id | phone | branch\_name | address |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Staff | staff\_id | branch\_id | first\_name | last\_name | dob | gender | email | address |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Payroll | staff\_id | designation | salary | work\_start\_date | commission |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| properties | property\_id | staff\_id | Client id | type | sale/rent | availability | listed date | listed price | features | address |

|  |  |  |  |
| --- | --- | --- | --- |
| Inspection | property\_id | inspection\_date | inspection\_time |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Advertisement | property\_id | newspaper\_name | adv\_date | comments | cost |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Client | client\_id |  | staff\_id | first\_name | last\_name | dob | gender | email | address | client\_type |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ClientChoice | client\_id | client\_type | budget\_start\_price | budget\_end\_price | location\_choice | pref\_size | pref\_bedroom\_no. | pref\_bathroom\_no. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Renters | client\_id | property\_id | monthly\_rent | agreement\_start\_date | agreement\_end\_date | landlord\_client\_id |

Relational schema definition

Branches (**branch\_id**, *manager\_id*, phone\_number, branch\_name, address\_line1, address\_line2, city, state, zipcode, country)

Staff (**staff\_id**, *branch\_id*, first\_name, last\_name, dob, gender, phone, email, address, street\_name, city, state, country, zipcode)

Payroll (***staff\_id***, designation, salary, work\_start\_date, commission)

Properties (**property\_id**, *staff\_id,* *client id, branch\_id*, property\_type, sale/rent, available, listed\_date, listed\_price, sold\_price, sale\_type, sq.ft, lot\_size, bedroom\_count, bathroom\_count, address\_line1, address\_line2, city, state, zipcode, country)

Inspection (***property\_id****,* inspection\_date, inspection\_time)

Advertisement (***property\_id***, newspaper\_name, advertisement\_date, comments, cost)

Clients (**client\_id,** *staff\_id*, first\_name, last\_name, dob, gender, phone, email, address, street\_name, city, state, country, zipcode, client\_type)

Client\_Choice (**client\_id,** client\_type, budget\_start\_price, budget\_end\_price, pref\_location, pref\_sq.ft, pref\_lot\_size, pref\_bedroom\_count, pref\_bathroom\_count)

Renters (***client\_id, property\_id***, monthly\_rent, agreement\_start\_date, agreement\_end\_date, landlord\_client\_id)

Definition of Domain for the attributes

**Branches**

Int branch\_id // primary key

Int manager\_id // primary key in staff table

int phone\_number //10 digit integer

string branch\_name // less than 40 char

string address\_line1 // less than 40 char

string address\_line2 // less than 40 char

string city // less than 20 char

string state // less than 20 char

int zipcode, // less than 10 int

string country // less than 30 char

**staff**

int staff\_id //primary key

int branch\_id //primary key in branch table

char first\_name //less than 20 char

char last\_name //less than 20 char

date dob //mm/dd/yyyy

char gender // m for male; f for female

string email // less than 40 char

int phone\_number //10 digit integer

string branch\_name // less than 40 char

string address\_line1 // less than 40 char

string address\_line2 // less than 40 char

string city // less than 20 char

string state // less than 20 char

int zipcode // less than 10 int

string country // less than 30 char

**Payroll**

int staff\_id //primary key

string designation // less than 15 characters

double salary //in dollars

date work\_start\_date //mm/dd/yyyy

int commission //represents the percentage of the property sold price, default value is 3

**Properties**

Int property\_id //primary key

Int staff\_id

int client\_id // refers to the current owner only and not the renter

int branch\_id

String property\_type //house, condo, townhouse

String sale/rent // for rent or for purchase

String available // yes denotes ‘available in market’, no - otherwise

Date listed\_date // mm/dd/yyyy

Int listed\_price

Int sold\_price

String sale\_type // AUSD, AUHB, PISD

Int sq.ft

Int lot\_size

Int bedroom\_count // 0 - 9

Int bathroom\_count // 0 - 9

string address\_line1 // less than 40 char

string address\_line2 // less than 40 char

string city // less than 20 char

string state // less than 20 char

int zipcode // less than 10 int

string country // less than 30 char

**Inspection**

Int property\_id //primary key

Date inspection\_date // mm/dd/yyyy

Time inspection\_time // hh:mm:ss

**Advertisement**

Int property\_id //primary key

String newspaper\_name // less than 40 char

date advertisement\_date // mm/dd/yyyy

string comments // less than 150 char

double cost // dollars

**Clients**

int client\_id //primary key

int staff\_id //primary key in staff table

int property\_id

char first\_name //less than 20 char

char last\_name //less than 20 char

date dob //mm/dd/yyyy

char gender // m for male; f for female

string email // less than 40 char

string address\_line1 // less than 40 char

string address\_line2 // less than 40 char

string city // less than 20 char

string state // less than 20 char

int zipcode // less than 10 int

string country // less than 30 char

**ClientChoice**

int client\_id //primary key

char client\_type //b for buyer, s for seller, r for renter, l for lease-landlord

int budget\_start\_price // price in dollars

int budget\_end\_price // price in dollars

string pref\_location // less than 40 char

int pref\_sq.ft

int pref\_lot\_size

int pref\_bedroom\_count //0 to 9

int pref\_bathroom\_count //0 to 9

**Renter**

int client\_id //primary key

int property\_id //primary key

double monthly\_payment\_amt //in dollars

date agreement\_start\_date //mm/dd/yyyy

date agreement\_end\_date //mm/dd/yyyy

int landlord\_client\_id // is also a client of FirstNation Properties, found in client table

Group Meeting Log

Date Time Activity

Sept 17 Alkek library (5 – 6pm) Entities were decided. Constraints of the model were listed.

Sept 24 Alkek library (5 – 6pm) Attributes to the entities were decided.

Constraints of the model were updated.

Oct 1 Alkek library (5 – 6pm) Few changes were done. A rough ER diagram was drawn.

Oct 3 in our house (11 – 2 pm) Final ER diagram, relational schema, domain

Oct 10 in our house (11 – 2 pm) Final document preparation work

All activities was done as team work by Harika and Lavanya.