

Assignment A3

Chapter6:

1 An atomic attribute _____.

2 The most likely data type for a surrogate key is _____.

3 From a strictly database point of view, _____ attribute values can be calculated when they are needed to write reports or invoices.

4 For most business transactional databases, we should normalize relations into _____.

5 BCNF can be violated only if the table contains more than one _____ key.

6 When designing a database, you should _____.
(Hint: It involves normalization, and what should be done prior to creating tables.)

7 Normalization represents a micro view of the _____ within the ERD.

8 The conflicts between design efficiency, information requirements, and processing speed are often resolved through _____.

9 _____ databases reflect the ever-growing demand for greater scope and depth in the data on which decision support systems increasingly rely.

Chapter5:

1 The most important characteristic of an entity is its _____ key, used to uniquely identify each entity instance.

2 In A _____ key is a real-world, generally accepted identifier used to uniquely identify real-world objects.

3 If one exists, a data modeler uses a _____ as the primary key of the entity being modeled.

4 The primary key's main function is to uniquely identify a(n) _____ within a table.

5 The "____" characteristic of a primary key states that: The PK must uniquely identify each entity instance. A primary key must be able to guarantee unique values. It cannot contain nulls.

6 The "____" characteristic of a primary key states that: The selected primary key must not be composed of any attribute(s) that might be considered a security risk or violation. For example, using a Social Security number as a PK in an EMPLOYEE table is not a good idea.

7 Surrogate primary keys are especially helpful when there is no ____ key.

8 ____ keys work with primary keys to properly implement relationships in the relational model.

9 The preferred placement for a foreign key when working with a 1:1 relationship is to ____.

10 ____ data refer to data whose values change over time and for which you must keep a history of the data changes.

Problem Set:

A city library issued a request for proposal (RFP) for a prototype database that models a small preliminary set of business rules. Based upon the database design from the following business rules, the city comptroller will award the project to the appropriate design team.

Library Business Rules:

- a. A member can borrow many books, and a book can be loaned to many members.
- b. A publisher can publish many books, but each book is published by only one publisher.
- c. An author can write many books, and a book can be written by more than one author.
- d. A book can be listed in more than one category (e.g., sports, crime, animals, computers, fiction, nonfiction, etc.).
- e. A category can be used for many books.

See **Assignment Guidelines** for attributes required for member, publisher, and author. (category, book_cat, attribution discussed in class. Additional attributes (**not including pks and fks**):

loaner:

lon_loan_date
lon_due_date
lon_return_date
lon_late_fee
lon_notes

book:

bok_title
bok_pub_date
bok_num_pages
bok_cost
bok_price
bok_notes

Note: *Always* refer to the Assignment Guidelines (see Notes) for "regular" attributes that *must* be included.

Helper Video: http://qcitr.com/vids/LIS3784_A3.mp4

Deliverables

ERD (**MUST Forward-Engineer, otherwise *no* credit**):

- Include at least 5 "**unique**" records per table
- **Must match** data types

Data Dictionary (See Textbook, also **match the color of the ERD entities**):

SQL Statements for A3 (Using data from ***your*** ERD)

Must include query result sets!

Joins ***must*** include **all 4 types of Inner Joins** (See Table 8.1)

For **each SELECT** statement

- List the members' first and last names, book ISBNs and titles, loan and due dates, and authors' first and last names sorted in descending order of due dates.
- List an **unstored** derived attribute called "book sale price," that displays the current price, which is marked down 15% from the original book price (format the number to two decimal places, and include a dollar sign).
- Create a **stored** derived attribute based upon the calculation above for the second book in the book table, and place the results in member #3's notes attribute.
- Using only SQL**, add a **test** table inside of your database with the following attribute definitions (use prefix **tst_** for each attribute), all should be not null except email, and notes:

```
id pk int unsigned AUTO INCREMENT,  
fname varchar(15),  
lname varchar(30),  
street varchar(30),  
city varchar(20),  
state char(2),  
zip int unsigned,  
phone bigint unsigned COMMENT 'otherwise, cannot make contact',  
email varchar(45) DEFAULT NULL,  
notes varchar(255) DEFAULT NULL,  
ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE utf8_general_ci
```
- Insert data into **test** table from **member** table
- Alter the last name attribute in **test** table to the following options:

```
tst_last varchar(35) not null, default 'Doe' and comment "testing"
```