Normalization and Creating Tables (1000 Points)

(For this Lab -there are various programs that can be used -- there is MS Excel, where by drawing boxes and using the arrows /lines option the graphics can be accomplished - there is also MS Visio, if available and the always faithful – pencil/pen/ruler and paper - ( which may require the use of a scanner for submission )

1. Using the table description and business rules listed below answer or perform the following:
2. Identify the Primary Key of the table as it is currently shown.
3. Identify all of the functional dependencies.
4. **Draw the dependency diagram** for the table(s)
5. Normalize the relation to 3rd  Normal Form (3NF).
6. List the normalized tables using the standard table notation

*(remember Chen and/or Crow’s foot)*

* + Tablename (Col1, Col2……Coln)

Primary Key:

Foreign Key:

1. **Draw the dependency** diagrams for each of the tables.

( Hint: you should have no less than four tables)

1. Provide an E-R Diagram of the tables to be created
2. Review pages 208 – 212 in text

3. Using the CREATE TABLE command, create each of the normalized tables. Run a

DESCRIBE command for each table.

* Include the PRIMARY KEY constraint for each table.
* Include the FOREIGN KEY constraint for each table to which it applies.
* Include the NOT NULL constraint for Student Name and Instructor Name.
* Include the CHECK constraint for the Grade to ensure it is one of the 5 acceptable values (A, B, C, D, or F).

4. Code INSERT commands to insert the data from the attached page into the tables you created in 2.

* Run ‘SELECT \* FROM tablename; commands to check the contents of your tables.

5. Your submittal/output to hand in should include: (with no less than ten pages)

* Question 1, part a.: Primary Key columns
* Question 1, part b.: Dependency Diagram
* Question 2, Part a.: List of normalized table descriptions
* Question 2, Part b.: Dependency diagrams for the normalized tables
* Question 2, Part c.: E-R Diagram of the tables to be created( Chen and Crow’s feet)
* Question 2 Part d.: UML Diagrams of the tables to be created

(See pages 143,144)

* Question 3: Print out of the CREATE TABLE commands & results.
* Question 3: Print out of the DESCRIBE table commands & resulting SQL message.
* Question 4: Print out of the INSERT commands & Resulting SQL message.
* Question 4: Print out of the SELECT \* FROM tablename listing and SQL results.

STUDENT TABLE

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student | Student | Student | Student | Course | Course | Instructor | Instructor | Instructor | Stu\_Crse |
| ID | Name | Address | Major | ID | Title | ID | Name | Office | Grade |
|  |  |  |  |  |  |  |  |  |  |
| 268300458 | Williams | 208 Brooks | CIS | CIS 350 | Database | 301 | Codds | B104 | A |
| 268300458 | Williams | 208 Brooks | CIS | CIS 465 | Systems Anal | 451 | Parsons | B317 | B |
| 543291073 | Bakker | 104 Philips | Acct | CIS 350 | Database | 301 | Codds | B104 | C |
| 543291073 | Bakker | 104 Philips | Acct | Acc 201 | Fund of Acctg. | 255 | Mills | H310 | B |
| 543291073 | Bakker | 104 Philips | Acct | Mkt 300 | Into to Mktg | 518 | Bennett | B212 | A |
| 695381127 | White | 208 Brooks | Math | Mth 202 | College algebra | 622 | Hilbert | M301 | B |
| 695381127 | White | 208 Brooks | Math | Acc 201 | Fund of Acctg | 255 | Mills | H310 | A |

Business Rules:

( see page 249 in Database Systems Text Figure 7.1)

* Only one class is taught for each course ID.
* Students may take up to 4 courses.
* Each course may have a maximum of 25 students.
* Each course is taught by only one Instructor.
* Each student may have only one major.