Database Design, CSCI 340, Spring 2016
Exam 1, Feb. 19

Multiple-Choice
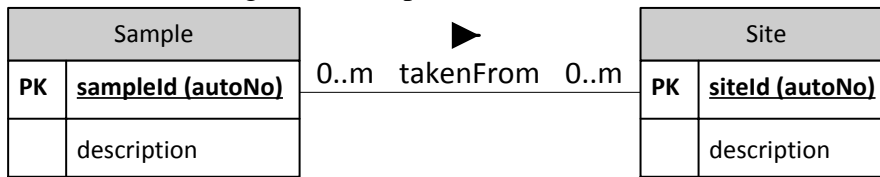
1. Which SQL statement determines the tables to use in a query? (3 pts)
    a. GROUP BY
    b. LIKE
    c. SELECT
    d. FROM
    e. WHERE

2. Which of the following is equivalent to a "table"? (3 pts.)
    a. record
    b. relation
    c. relationship
    d. constraint
    e. schema

3. Which of these are dependent on the *extension* of a database (as opposed to the *intension*)? (3 pts)
    a. primary key of a relation
    b. domain of an attribute
    c. degree of a relation (the number of attributes in a relation)
    d. cardinality of a relation (the number of records in a relation)
    e. cardinality of a relationship (the number of relations which participate in the relationship)

4. An attribute or a set of attributes that uniquely identify each record in a table, and where no subset of these attributes provides this uniqueness, is a: (3 pts)
    a. foreign key
    b. primary key
    c. candidate key
    d. super key
    e. composite key

5. Given the following relationship:

Sample			Site	
Sample			**Site**	
PK	**sampleId (autoNo)**	0..m takenFrom 0..m	PK	**siteId (autoNo)**
	description			description

The leftmost m (the m closest to the Sample relation) most closely indicates that:
   a. A sample may have been taken from multiple sites.   (3 pts.)
   b. A sample must have been taken from multiple sites.
   c. A site may have multiple samples taken from it.
   d. A site must have multiple samples taken from it.
   e. There must be multiple samples in the database

Short Answer

6. There are two types of SQL commands: DDL and DML. Tell what each of these acronyms stand for.

    DDL –   (3 pts.)

    DML –   (3 pts.)

    What type of command is the query: (3 pts.)
            SELECT hotelName FROM Hotel WHERE city='Butte'?

7. One of the services provided by most DBMSs is integrity.

    What is meant by integrity in the context of a DBMS?   (3 pts.)

    .

    Give an example of integrity in the context of a DBMS?   (3 pts.)

8. For what does HIPAA stand?   (5 pts.)

9. Hot Water (HW) is a small start-up company that sells spas. HW does not carry a stock of spas. A few spas are set up in a simple warehouse so customers can see some of the models available. Whenever a customer wants to purchase a spa, the spa must be ordered. HW wants to track the manufacturers of spas which they sell. They also want to track the brand and models of the spas.

- HW can get spas from several different manufacturers
- Each manufacturer produces one or more different brands of spas.
- Each and every brand is produced by only one manufacturer
- Every brand has one or more models
- Every model is produced as part of a brand. For example, Iguana Bay Spas is a manufacturer that produces Big Blue Iguana spas, a premium-level brand, and Lazy Lizard spas, an entry-level brand. The Big Blue Iguana brand offers several models, including the BBI-6, an 81-jet spa with two 6-hp motoes, and the BBI-10, a 102-jet spa with three 6-hp motors.
- Every manufacturer is identified by a manufacturer code, the company name, address which consists of a street, city, state and zip, area code, phone number, and account number are kept in the system for every manufacturer.
- For each brand, the brand name and brand level (premium, med-level, or entry-level) are kept in the system.
- For each model the model number, number of jets, number of motors, horsepower of teach motor (all motors will have the same horsepower), suggested retail price, HW retail price, dry weight, water capacity, and seating capacity must be kept in the system.

Imagine that you are responsible for developing a database application for HW. Begin by developing a conceptual model for it. This model should show primary key by underlining the attribute or attributes, it should show partial primary keys by underlining and appending {PPK}, relationships, and minimum and maximum cardinalities on those relationships. Name all relationships and indicate how to interpret the name via a triangular arrow ► and ◄. Since this is a conceptual model not a logical model, foreign keys and join tables should not be included in the diagram.

(20 pts.)
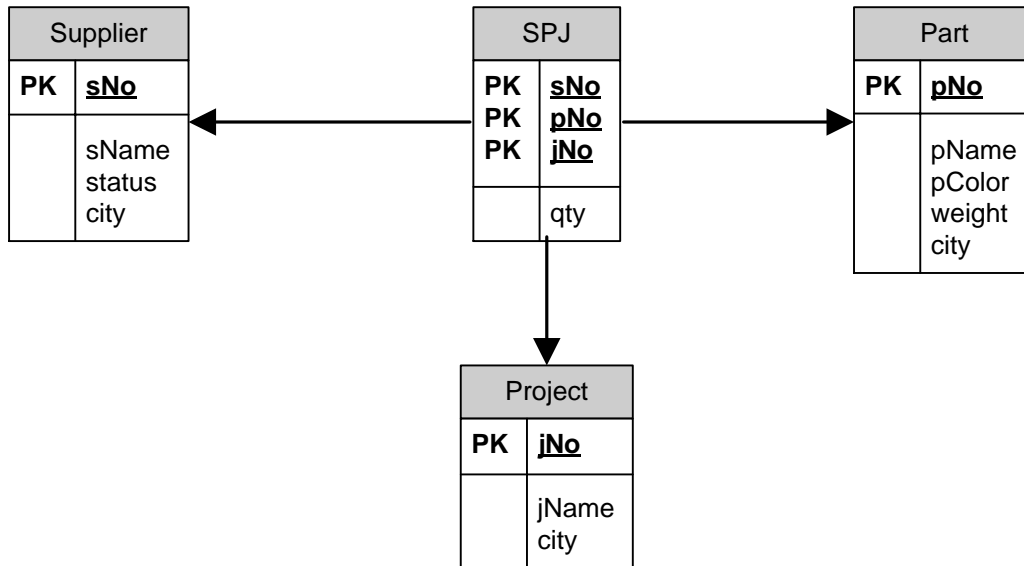
Give a referential constraint for the HW system. (2 pts.)

Give a possible general constraint for the HW system. (3 pts.)

Queries (written without a computer)

Suppliers-Parts-Project
Database

Supplier	
PK	**sNo**
	sName status city

SPJ	
PK **PK** **PK**	**sNo** **pNo** **jNo**
	qty

Part	
PK	**pNo**
	pName pColor weight city

Project	
PK	**jNo**
	jName city

10. Give a query which displays the name, color and manufacturing city of all parts which weigh 14 or more but strictly less than 17.   (5 pts.)

11. Give a query which displays the total number of parts being supplied in the database. These parts can be of any type, supplied by any supplier, and to any project.
                                                                                        (5 pts.)

12. Give a query which lists the names of those cities where projects are located, and the total number of parts supplied to projects in that city exceeds 500.　　　(5 pts.)

13. Say that an existing project has relocated. That is, the EDS project which was located in Oslo and has the project number J006, has relocated to Venice. Write the statement to make this change in the database.　　　　　　　　　(5 pts.)

Extra credit:

14. What mysql command is used to link to a database so that queries entered at the command prompt will be written against this database? (1 pt.)
    a. connect
    b. link
    c. select
    d. switch
    e. use

15. What SQL command is used to add a table to the current database? (In each statement tableName is replaced by the name of the table to be added.)
    a. ADD TABLE tableName (1 pt.)
    b. INSERT TABLE tableName
    c. BUILD TABLE tableName
    d. CONSTRUCT TABLE tableName
    e. CREATE TABLE tableName

16. What SQL command is used to modify a table within the current database? (In each statement tableName is replaced by the name of the table to be modified.)
    a. CHANGE TABLE tableName (1 pt.)
    b. MODIFY TABLE tableName
    c. UPDATE TABLE tableName
    d. ALTER TABLE tableName
    e. Tables cannot be modified, they must be dropped and then recreated
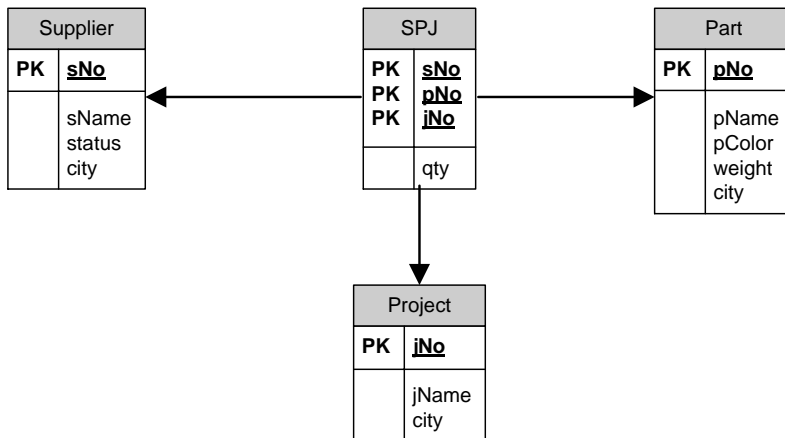
Database Design, CSCI 340, Spring 2016
Exam 1, Computer Portion, Feb. 19

Please turn in the first portion of the exam before beginning this portion. To complete this portion of the exam you may use your notes, any previous assignments, the text and/or the Internet. You may not communicate with anyone other than myself during this exam.

You can use either SQLServer or MySQL for this exam.

Write queries for the following. Remember that your query must work for any extension of the database, not just the current extension.

Suppliers-Parts-Project
Database

Supplier	
PK	**sNo**
	sName
	status
	city

SPJ	
PK	**sNo**
PK	**pNo**
PK	**jNo**
	qty

Part	
PK	**pNo**
	pName
	pColor
	weight
	city

Project	
PK	**jNo**
	jName
	city

17. Give a query which displays the name, color and manufacturing city of all parts which weigh 14 or more but strictly less than 17.   (5 pts.)

18. Give a query which displays the total number of parts being supplied in the database. These parts can be of any type, supplied by any supplier, and to any project.
                    (5 pts.)

19. Give a query which lists the names of those cities where projects are located, and the total number of parts supplied to projects in that city exceeds 500.   (5 pts.)

20. Give a query which lists all supplier names (call this field "Supplier"), along with the average number of parts which they supply to any project (call this field "Average Number of Parts". Note that if a supplier does not supply any parts to any project, their name should still appear in the results with an average of 0.   (5 pts.)

Extra Credit

Using the sample data for the Suppliers/Parts/Project database, tell what part numbers are for parts supplied to all projects in London. (2 pts.)

Write a query which will answer this question for any sample data. (3 pts.)