Database final exam study:

Q & A from the tests

Test 1:

PART I – Terminology

1. Question 1: define the following

* What is a database?

1. A database is an organized system of logically related data

* What is a database management system?

1. A DBMS is an application used to access data in a database using a querying language

* What is an Entity relationship diagram?

1. An entity relationship diagram is a diagram used to show the relationships between different entities in a database.

* What is SQL?

1. SQL (structured query language) is a scripting language used for interacting with data in a DBMS. It’s used to run queries on data.
2. A relational database is defined as “Database technology involving tables representing entities and primary/foreign keys representing relationships”. Define the following using examples.

* Entity:

1. An entity is one “type” of piece of data, like a table. For example, from the HVK use case, we have a pets table or a customer table. Each of those is it’s own “type” of data in the DB.

* Relationship:

1. A relationship is the cardinality and optionality between multiple tables. How many ways a table is logically associated to another table.
2. SQL is decomposed into several sub languages based on functionality. Define and describe each of the sub-languages.

* DDL

1. Data definition language is used to define the data. It creates tables, deletes tables and alters them or the way that the columns in the table are defined.

* DCL

1. Data control language is used to determine who has access to what data. It defines permissions and accessibility within the database.

* DML

1. Data manipulation language is used to create the actual entries in the database. It updates, deletes and retrieves data from the DB.

* TCL

1. Transaction control language is used to determine what transactions will really get applied to a database. Used to commit or rollback changes, create backups and save points, etc.

1. Define the term DBA and describe the role of a DBA

* A database administrator is the person who controls the entire database. They decide who the users are, they control each user or groups authority in a database and control the overall organization in a database. They are the ones who will manage the entire database.

Part II – Short answer

1. Explain how database applications can be developed much more quickly than traditional file applications.
2. Differentiate between the following pairs of terms giving examples where appropriate.
3. Data and meta data
4. Conceptual data model and physical data model
5. A problem with tradiotinal file systems is data duplication which can lead to data inconsistency or loss of data integrity. Data inconsistency can lead to the deletion, insertion or modification anomalies. Given the definition of each below, give an example from the college file system for a problem that could arise for each anomaly
6. Deletion anomaly – A record is deleted from one file, but not another
7. Insertion anomaly – A record is added to one file, but not from another
8. Modification anomaly – A record is changed in one file, but not another
9. For each of the following, put an X in the appropriate boxes in the table below to identify whether it is describing data or metadata. If it is describing metadata, indicate whether it is a property of the data or a fact describing the data. If it is describing data, indicate whether it is structured or unstructured data.
10. A picture of Jasper, the dog.
11. The fact that the date of the dog’s next vaccination must be after the last date of the dog’s stay at the kennel
12. The name, address and phone number of Jasper’s owner
13. The fact that the phone number field must be a text field containing 10 characters.

|  |  |  |
| --- | --- | --- |
|  | Type of data | |
|  | Metadata | Data |
|  |  | X |
|  | X |  |
|  |  | X |
|  | X |  |

1. Draw an ERD that captures the following:
2. A person can own a dog
3. Many people can share ownership of the dog
4. A person may own many dogs
5. Some dogs may not have an owner
6. Provided the SQL commands for the following queries based on the database tables defined in appendix II. This is the same databse that you’ve used in 2 labs.
7. Show all employees first name, last name and phone number

SELECT firstname, lastname, phonenumber

FROM employee;

1. List all customers (first name, last name, city) in the USA

SELECT firstname, lastname, city

FROM customer

WHERE country=’USA’;

1. List all album titles by the artist Queen in alphabetical ascending order

SELECT title

FROM artist a, album t

WHERE a.name = ‘Queen’

AND t.artistid = a.artistid

ORDER BY a.title asc;

PART III – Multiple choice