Beaconfire Inc, Home Work, Week2 Day8.
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Short Answer:

1. What is data modeling? Why do we need it? When would you need it?

-> Data modeling is the process of analyzing business requirement, design and create physical instance or a plan or blue print for DB.
-> because, it is a stage of SDLC, software development life cycle. And also impact the user interface.
-> when the businese request data to be store and processing for the some use case.

2. What is an entity? What is an attribute? What is a tuple? What is a domain?

-> Entity: an item that can exist independent or uniquely identified.
-> Attribute: or column label, name, column of table.
-> Tuple: or row of table.
-> domain: Set of values for attribute or column.

3. What is a superkey? Give an example of a superkey that is n`ot a candidate key and explain why.

-> one or more attribute that can uniquely identify a tuple or row. Ex: student_id, (student_id, student_name). All superkey cannot be candidate key, but all candidate key can be super key, and is minimal super key. No proper subset of candidate key can uniquely identify a tuple or column.

4. What is the primary key? How is it different from a unique key?

-> Primary key, selected from candidate key, one for a table,usually is id for column like auto increase integer. But Unique key is used for prevent duplicate values in the column or tuple, except for null values.

5. What are relationships in data modeling?

-> is the connect between entities, and reflect business rule. The relationships can be one to one, one to many, and many to many.

6. What is cardinality in data modeling?What are different types of cardinalities?Give example for each type.

-> refer to the relationships between the data in two table, it defines how many instance of one instance are relate to another. There are 3 defferent type of cardinalities like one to one relationships: Person and person's contact; one to many: customer and orders; many to many: customers and products.
https://fmhelp.filemaker.com/help/18/fmp/en/index.html#page/FMP_Help%2Fmany-to-many-relationships.html%23

7. What is composite attribute, multi-valued attribute, and derived attribute? Give at least one example for each type of attribute that is not in the course material.

-> composite attribure is compose many other attribute, ex: address contain street number, home number, city, state, zip code. Multi-valued attribute is take up more than one single valued attribute, ex: phone number - work number, and home number, personal number. Derived attribute is can derive from other attribute, Ex: result of total or average score of student that calculate from all courses of student.
https://www.geeksforgeeks.org/types-of-attributes-in-er-model/

8. How do you represent a many-to-many relationship in a database?Please describe in detail using an example.

-> using example of products table and customers table, like one or more customers can order one or multiple products, and also one kind of product multiple product can be order by multiple customer.

9. What is normalization and why is it needed?

-> Reduce redundancy, avoid anomaly and create a well- structured series of table without error or inconsistencies. Minimize redesign when extending the database structure new type of data can be accommodated without changing existing structure too much Ensures data dependencies are properly enforced by data integrity constraints (Entity Integrity, Referential Integrity, Domain Integrity)

10. What does data redundancy mean? Give an example of data redundancy.

-> same data occur in the two or more record. Like duplicate entity of customer name.

11. What are the different types of dependencies? How are they different? Give an example of each type.

TYPES OF FUNCTIONAL DEPENDENCIES IN NORMALIZATION

->Fully Dependency: all depend on attribute: std_name depend on std id.

Transitive Dependency: When an indirect relationship causes functional dependency it is called Transitive Dependency. If P -> Q and Q -> R is true, then P-> R is a transitive dependency.

Partial Dependency: If a Non prime or Non key attribute of the relation is dependent on only a part of the candidate key then such dependency is defined as partial dependency.

https://www.tutorialspoint.com/Types-of-dependencies-in-DBMS

12. What are normal forms? Which normal forms are most common?

-> are used to eliminate or reduce redundancy in database tables.

• First Normal Form: Each table cell should contain a single value. Each record needs to be unique.

• Second Normal Form, Meets all of 1NF, Makes sure all non-prime attributes are fully dependent on a prime attribute.

• Third Normal Form: Meets 1NF and 2NF, Every non-prime attribute is non-transitively dependent on the prime attributes.

13. What is database integrity? Why do you need it? Provide an example of user-defined integrity.

-> is the overall accuracy, completeness, and consistency of data. Data integrity also refers to the safety of data in regard to regulatory compliance — such as GDPR compliance — and security. It is maintained by a collection of processes, rules, and standards implemented during the design phase.

Ex: Entity integrity, Domain integrity, Referential integrity, User-defined integrity.

14. What is DDL? What are the major statements in DDL?

-> Create, alter, and drop, truncate schema objects. Data Definition Language actually consists of the SQL commands that can be used to define the database schema.

15. What is DML? What are the major statements in DML?

-> Data Manipulation Language (DML) Statements, select, insert, update, delete...

are the element in the SQL language that is used for data retrieval and manipulation.

16. How do you insert values into a table if you don't know the order of the columns?

-> To execute an INSERT statement without typing the column names, specify the values in the same order that the columns appear in the table.

INSERT into tableName (col_a, col_b) VALUES('Name', 1), ('Name', 2)

17. How is truncate different from delete?

-> truncate just empty the table, not remove table from database, but delete is remove table from the database.

18. Is syntax in SQL case sensitive?

-> No.

19. What are constraints? Why do we need them? Are they mandatory to have?

-> A constraint can be defined as the property assigned to a column or the set of columns in the database table which prevents inconsistent data values to be stored into the certain columns.

20. How do you make sure there are no duplicate values in a column?

-> constrain or set the attribute to be unique by put unique keyword.

21. How many ways can you add constraints to a table? How are they different?

-> When create table: CREATE TABLE, after create table: ALTER TABLE, and when modify the column.