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**Database Management System Assignment #5**

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**Submitted to:**

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**Entity Relationship model**

1. **What do you mean by Entity- Relationship Diagram? Explain**

An entity-relationship diagram (ERD) is a data modeling technique that graphically illustrates information system’s entities and the relationships between those entities.

An entity-relationship diagram (ERD) is a graphical representation of an information system that shows the relationship between people, objects, places, concepts or events within that system. An ERD is a data modeling technique that can help define business processes and can be used as the foundation for a relational database.

Entities, relationships and cardinality are the three main elements of ERD. Entities are the objects or concepts that have data stored about them and cardinality defines the relationship between the entities in terms of numbers. The steps involved in creating an ERD are as follow:-

* Identifying and defining the entities
* Determining all interactions between the entities
* Analyzing the nature of interactions/ determining the cardinality of the relationship
* Creating the ERD

1. **Define entity and give an example**

An entity is a grouping of things with rules or data in common. An entity often represents a group of people (eg children) but it can also represent a group of objects (eg. textbooks), activities (eg assignments) or concepts. An entity can be a real-world object, either animate or inanimate, that can be easily identifiable. For example: in a school database, students, teachers, classes and courses offered can be considered as entities. By defining entities, the same set of rules can be used for multiple instances of the same type and rules can be written which relate to all those instances.

1. **Explain the difference between an entity class and entity instance**
2. **Define attribute and its types.**

Attributes are the characteristics that define an entity. In DBMS, an attribute refers to a database component such as table or database field. For example a student entity may have name, class and age as attributes.

The types of attribute are as follow

1. **Simple attribute**

Simple attribute are atomic values, which cannot be divided further. For example a student’s phone number is an atomic value of 10 digits.

1. **Composite attribute**

Composite attributes are made of more than one simple attribute. For example: a student’s complete name may have first\_name and last\_name.

1. **Derived attribute**

Derived attributes are the attributes that do not exist in the physical database, but their values are derived from other attributes present in the database. For example, average\_salary in a department should not be saved directly in the database, instead it can be derived. For another example, age can be derived from data\_of\_birth.

1. **Single-value attribute**

Single-value attributes contain single value. For example − Social\_Security\_Number.

1. **Multi-value attribute**

Multi-value attributes may contain more than one values. For example, a person can have more than one phone number, email\_address, etc.

1. **What is derived attributes?**

Derived attributes are the attributes that do not exist in the physical database, but their values are derived from other attributes present in the database. For example, average\_salary in a department should not be saved directly in the database, instead it can be derived. For another example, age can be derived from data\_of\_birth.

1. **Define relationship and give an example.**

The association between entities is called a relationship. For example, an employee works\_at a department, a student enroll in a course. Here works\_at and enrolls are called relationships.

1. **Explain the difference between a relationship class and a relationship instance.**
2. **Define degree of relationship.**

Degree of relationship refers to the number of participating entities in a relationship.

It can be following types:

1. Binary: Relationship between any two entities
2. Ternary: Relationship between any three entities
3. N-ary: Relationship between n entities
4. **List and give an example of the three types of binary relationships. Draw an E-R diagram for each.**
5. **Define the terms maximum cardinality and minimum cardinality.**
6. **Explain the distinctions among the terms primary key, candidate key and super key.**

Keys is an attribute or collection of attributes that uniquely identifies an entity among entity set.

Super key refers to a set of attributes that collectively identifies an entity in an entity set.

Candidate key refers to a minimal super key. An entity set may have more than one candidate key.

Primary key is one of the candidate keys chosen by the database designer to uniquely identify the entity set.

1. **What are the main building modules of the entity relationship model? Discuss each one.**
2. **What is composite attributes, when it is used?**
3. **Explain the difference between single-value attributes and simple attributes.**
4. **Discuss the difference between a composite key and a composite attribute. How would each indicated in an E-R diagram?**
5. **What two courses of action are available to a designer when a multivalued attribute is encountered ?**
6. **Explain the various terms of an E-R model and how are they represented in an E-R model?**
7. **Explain the concept of dependent entities? Give example.**
8. **What is the difference total and partial participation? Explain.**

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| **Total Participation** | **S.No.** | **Partial Participation** |
| Each entity is involved in the relationship. | 1. | Not all entities are involved in the relationship |
| Total participation is represented by double lines | 2. | Partial participation is represented by single lines |

1. **What do you mean by mapping cardinalities ? explain various type of cardinalities.**
2. **What is the difference between single-value and multivalued attributes? Explain**
3. **Explain the concept of participation constraints.**
4. **Difference the binary relationship with ternary relationship with example.**
5. **Explain the difference between weak and strong entity set.**
6. **Define the components of extended E-R features.**
7. **Define the concept of aggregation. Give two examples of where this concept is useful.**
8. **Explain the distinction between disjoint and overlapping constraints.**
9. **Explain the distinction between total and partial constraints.**

**29. Write short notes on:**

**· Specialization**

**· Generalization**

**· Aggregation**