Assignment 1

1) Define following terms with suitable example

a) Strong entity sets

→ A strong entity is not dependent on any other entity in the schema. A strong entity will always have a primary key. They are represented by a single rectangle. Their relationships are represented by a single diamond.

Eg: Customer may be a strong entity in a database for e-commerce

b) Derived attribute

→ Derived attributes are the attributes that do not exist in the physical database, and their values are derived from other present attributes present in the database.

Eg: average_salary or age are examples of derived attributes

c) Foreign key

→ Foreign keys are the columns of a table that points to the primary key of another table. They act as a cross-reference between tables

Eg: stu_id in course_enrollment table could be a foreign key pointing to stu_id in Student table

d) Primary key

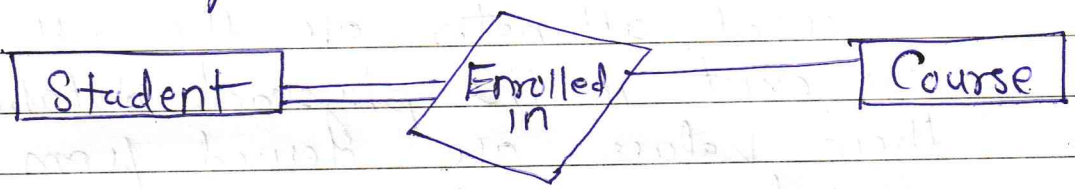
→ A primary key is a field in a table which uniquely identifies each row / record in a database table. They must contain unique values. It cannot have null values.

Eg: The id of an employee could be a primary key in the employee table

e) Total participation

→ This specifies that each entity in the entity set must compulsorily participate in at least one relationship instance in that relation ship set.

Eg:



f) Weak entity sets

→ Entities should have a key attribute which uniquely identifies each entity in the entity set, but there exists one type for which key attributes cannot be defined. These are called weak entity types / sets.

Eg: Rooms can be seen as a weak entity of a hotel's database, since the existence of rooms is entirely dependent on the existence of the hotel

g) Attributes

→ The properties of an entity that describe that entity are called as attributes of that entity. An entity can have one or more types of attributes. Some types are:

1) Single-valued
2) Composite
3) Multi-valued
4) Derived
5) Simple.

Eg: phone_number, address, age, name are all attributes

h) Relationship sets

→ A relationship is defined as an association among several entities. Any way that one entity is ~~comme~~ associated to another is called a relation

Eg: 'enrolled in' is a relationship that exists between student & course

2) "Existence of weak entity is dependent on strong entity" Justify your answer.

→ A weak entity is an entity that cannot exist except by being dependent on another entity that is strong, since a weak entity has no unique attributes of its own.

Let us take an example to understand this better: A room is an example of a weak entity because, it cannot exist without the existence of a hotel (the strong entity).

Hence, the room can be identified with respect to the hotel and hence its existence depends on the hotel

4) Let E1 & E2 be two entities in an E/R diagram with simple single-valued attributes. R1 & R2 are two relationships between E1 & E2, where R1 is one-to-many & R2 is many-to-many. R1 & R2 do not have any attributes of their own. What is minimum number of tables required to represent this in relational model?

→ A minimum of 3 tables is required.

Strong entities E1 & E2 are represented as seperate tables.

In addition, many-to-many relationship's (R2) must be connected as seperate table by having primary keys of E1 & E2 as foreign keys.

One-to-many relationship (R1) must be transferred to ~~may~~ many side table (E2) by having primary key of one side (E1) as foreign key.

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