**Introduction to E R model**

ER model is best used for the conceptual design of the database. ER model is based on

* Entities and their attributes
* Relationship among entites

The components of ER model are as follows:

|  |  |
| --- | --- |
| Entity |  |
| Relationship |  |
| Attribute |  |
| connector |  |
| Weak entity |  |

Entity:

An entity is an object or a thing in the real world that can be distinguishable from other objects.

Entity set :

Set of entities of same type that share the same property.

Attribute:

It is the property or characteristics of entity set.

Types of attributes:

1 simple attributes : they are atomic values that cannot be divided further.

Ex: Rollno

2. composite attributes: they are made of more than one simple attributes.

Ex: Address

3. Derived Attributes: they does not exists in the physical database but their values are derived from other attributes present in the database.

Ex: age

4. single-valued attribute: attributes which takes single values in all instances is called single valued attribute.

Ex: hallticket number

5. multi-valued attribute: attributes may contain more than one value.

Ex: phone number

6. Null attribute: which does not have any value for an entity.

Ex: parents mail-id

7. descriptive attribute: it is used to record the information for the relationship.

Ex: since

Relationship: the logical association among entities is called relationship. They are mapped with entity in various ways. Mapping cardinalities defines the number

1. One to one
2. One to many
3. Many to one
4. Many to many

**Task – 1**

**Construction of E-R diagram**

1. A university database contains information about professors (identified by social security number) and courses (identified by courseid). Professors teach courses; each of the following situations concerns the Teaches relationship set. For each situation, draw an ER diagram that describes it.

* Professors can teach the same course in several semesters,and each offering must be recorded.











Consider the following information about a university database:

* Professors have an SSN, a name, an age, a rank, and a research specialty.
* Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget.
* Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.).
* Each project is managed by one professor (known as the project’s principal investigator).
* Each project is worked on by one or more professors (known as the project’s co-investigators).
* Professors can manage and/or work on multiple projects.
* Each project is worked on by one or more graduate students (known as the project’s research assistants).
* When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.
* Departments have a department number, a department name, and a main office.
* Departments have a professor (known as the chairman) who runs the department.
* Professors work in one or more departments, and for each department that they work in, a time percentage is associated with their job.
* Graduate students have one major department in which they are working on their degree.
* Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

Design and draw an ER diagram that captures the information about the university. Use only the basic ER model here, that is, entities, relationships, and attributes. Be sure to indicate any key and participation constraints.

