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**Database Management System Assignment #4**

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# ER diagram

# Design

## Functional design

## Database design

### Conceptual database design

### Logical Database design

### Physical Database design

# Characteristics of relation

# E-R to relational mapping algorithm

Any object, for example, entities, attributes of an entity, relationship sets, and attributes of relationship set, can be represented with the help of an ER diagram.

## Mapping of regular entity

* For each regular (strong) entity type E in the ER schema,create a relation R that includes all the simple attributes of E.
* Choose one of the key attributes of E as the primary key for R.
* If the chosen key of E is composite, the set of simple attributes that form it will together form the primary key of R

## Mapping of weak entity type

## For each weak entity type W in the ER schema with owner entity type E, create a relation R & include all simple attributes (or simple components of composite attributes) of W as attributes of R.

## Also, include as foreign key attributes of R the primary key attribute(s) of the relation(s) that correspond to the owner entity type(s).

## The primary key of R is the combination of the primary key(s) of the owner(s) and the partial key of the weak entity type W, if any.

## Mapping of binary 1:1 relation types

For each binary 1:1 relationship type R in the ER schema, identify the

relations S and T that correspond to the entity types participating in R.

➲ There are three possible approaches:

* + Foreign Key approach: Choose one of the relations-say S-and include a foreign key in S the primary key of T. It is better to choose an entity type with total participation in R in the role of S.
    - Example: 1:1 relation MANAGES is mapped by choosing the participating entity type DEPARTMENT to serve in the role of S, because its participation in the MANAGES relationship type is total.
  + Merged relation option: An alternate mapping of a 1:1 relationship type is possible by merging the two entity types and the relationship into a single relation. This may be appropriate when both participations are total.
  + Cross-reference or relationship relation option: The third alternative is to set up a third relation R for the purpose of cross-referencing the primary keys of the two relations S and T representing the entity types.

## Mapping of binary 1:N relation types

* For each regular binary 1:N relationship type R, identify the relation S that represent the participating entity type at the N-side of the relationship type.
* Include as foreign key in S the primary key of the relation T that represents the other entity type participating in R.
* Include any simple attributes of the 1:N relation type as attributes of S.

## Mapping of binary M:N relationship types

## For each regular binary M:N relationship type R, create a new relation S to represent R.

## Include as foreign key attributes in S the primary keys of the relations that represent the participating entity types; their combination will form the primary key of S.

## Also include any simple attributes of the M:N relationship type (or simple components of composite attributes) as attributes of S.

## Mapping of multi-value Attribute

## Mapping of N-ary relationship types