Database Management System (DBMS)

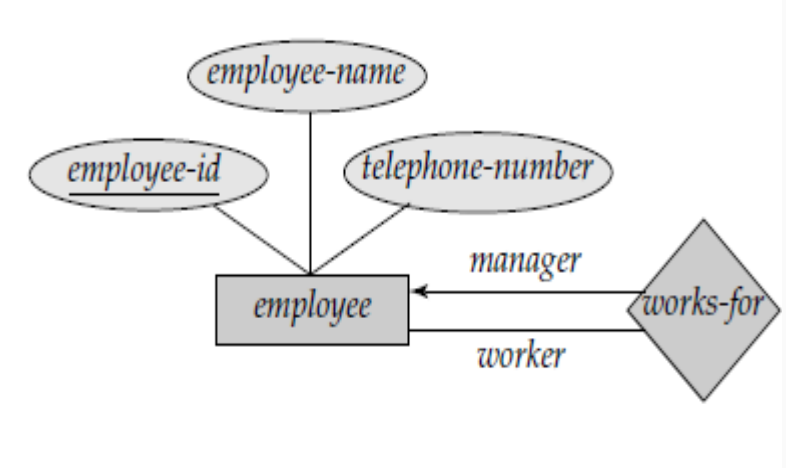
Lecture-10

Dharmendra Kumar

August 19, 2020

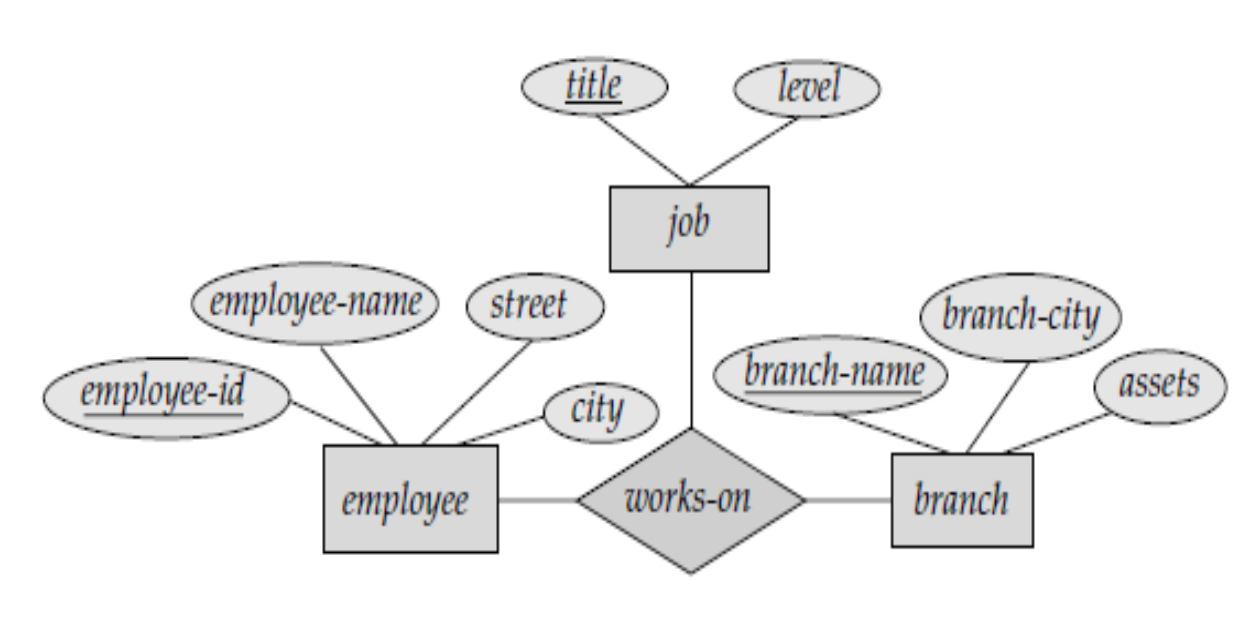
Some E-R diagram examples

Example: E-R diagram showing role indicator.



Some E-R diagram examples

Example: E-R diagram showing ternary relationship.



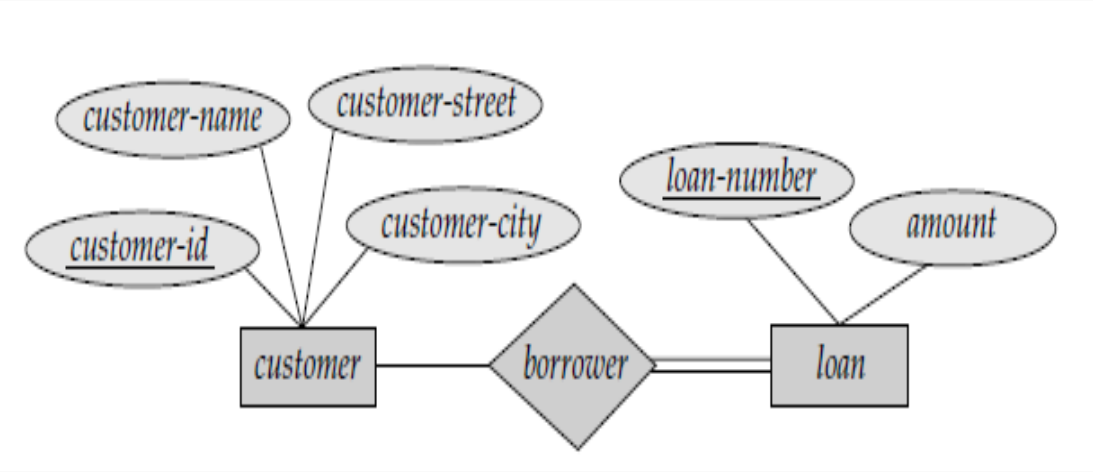
We permit at most one arrow out of a relationship set, since an E-R diagram with two or more arrows out of a non-binary relationship set can be interpreted in two ways. Suppose there is a relationship set R between entity sets $A_1, A_2, ..., A_n$, andthe only arrows are on the edges to entity sets $Ai + 1, A_{i+2}, ..., A_n$. Then, the two possible interpretations are:

Some E-R diagram examples

1. A particular combination of entities from $A_1, A_2, ..., A_i$ can be associated with at most one combination of entities from $Ai + 1, A_{i+2}, ..., A_n$. Thus, the primary key for the relationship R can be constructed by the union of the primary keys of $A_1, A_2, ..., A_i$.
2. For each entity set $A_k, i < k \leq n$, each combination of the entities from the other entity sets can be associated with at most one entity from A_k. Each set $\{A_1, A_2, ..., A_{k-1}, A_{k+1}, ..., A_n\}$, for $i < k \leq$ n, then forms a candidate key.

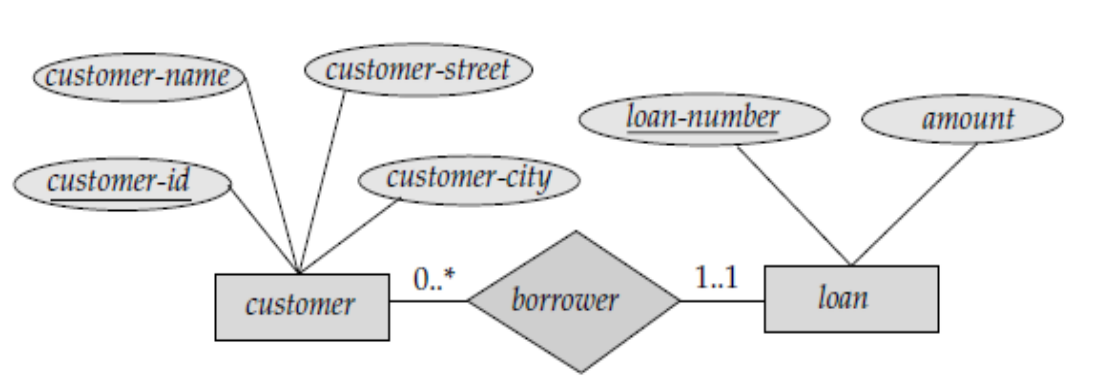
Some E-R diagram examples

Example: E-R diagram showing total participation.



Some E-R diagram examples

Example: E-R diagram showing alternative notation for cardinality limits.



- An edge between an entity set and a binary relationship set can have an associated minimum and maximum cardinality, shown in the form l..h, where l is the minimum and h the maximum cardinality.
- A minimum value of 1 indicates total participation of the entity set in the relationship set.
- A maximum value of 1 indicates that the entity participates in at most one relationship, while a maximum value * indicates no limit.
- Note that a label 1..* on an edge is equivalent to a double line.

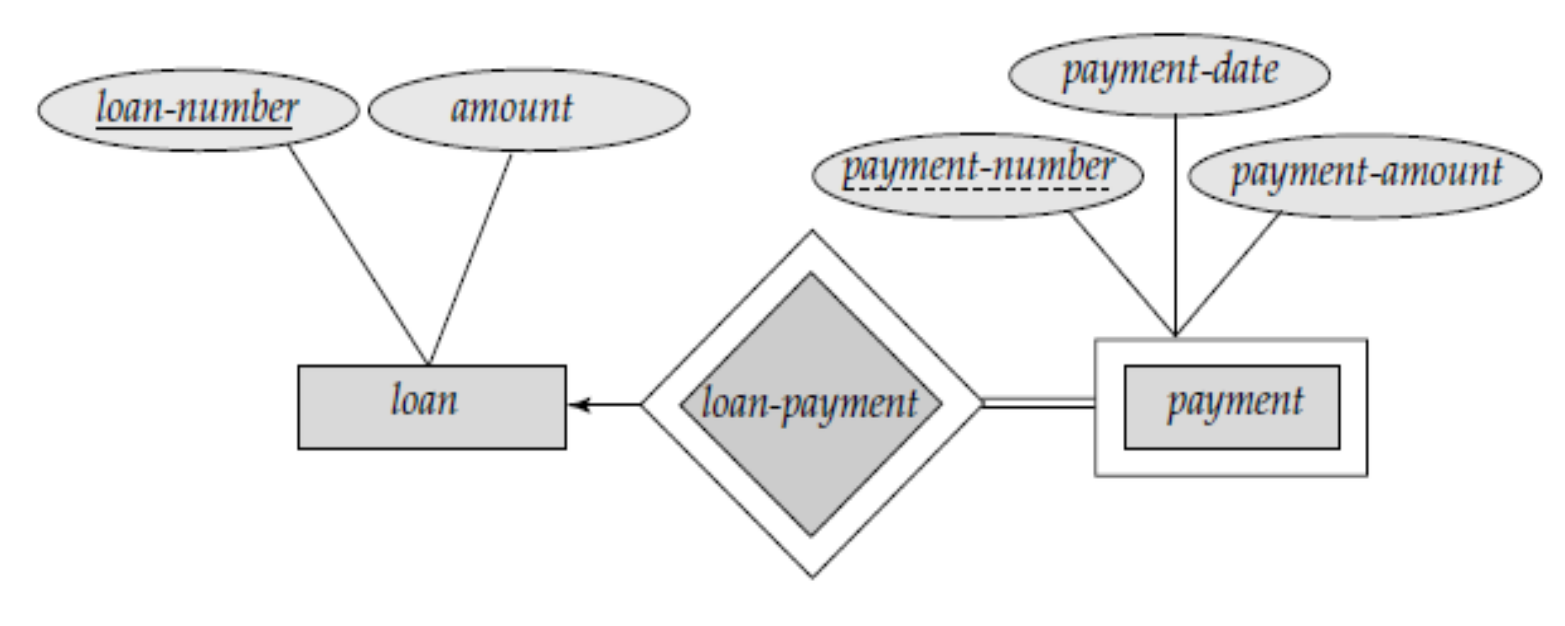
Weak Entity Sets

- An entity set that does not have a primary key is referred to as a **weak entity set**.
- An entity set that has a primary key is termed as a strong entity set.
- The existence of weak entity set depends on the existence of an **identifying or owner entity set**.
- The relationship associating the weak entity set with identifying entity set is called an **identifying relationship set**.
- The identifying relationship is many to one from the weak entity set to the identifying entity set, and the participation of the weak entity set in the relationship is total.

Weak Entity Sets

- The **discriminator** of a weak entity set is a set of attributes that distinguishes among all the entities in weak entity set that depends on one strong entity set. It is also said to be **partial key**.
- The primary key of a weak entity set is formed by the primary key of the strong entity set on which the weak entity set is dependent plus the weak entity set's discriminator.
- Weak entity set is represented by double rectangle.
- The discriminator of a weak entity set is shown with dashed lines.
- The identifying relationship set is represented by double diamonds

Weak Entity Sets



In this E-R diagram, payment is a weak entity set and loan is a strong entity set. loan-payment is an identifying entity set. Discriminator of payment is payment-number. Primary key of payment will be {loan-number,payment-number}.