BITS, PILANI – K. K. BIRLA GOA CAMPUS

Database Systems

(CS F212)

by

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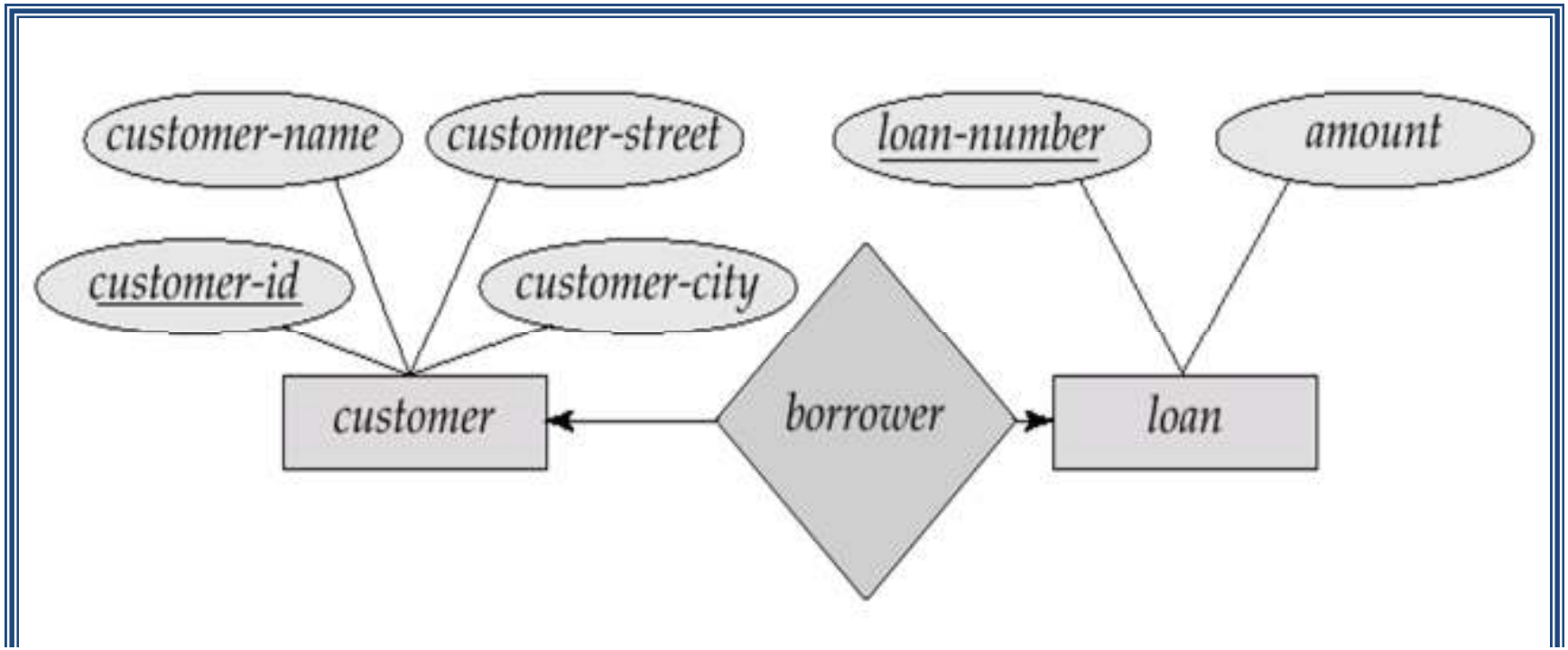
Example of Binary Relationship

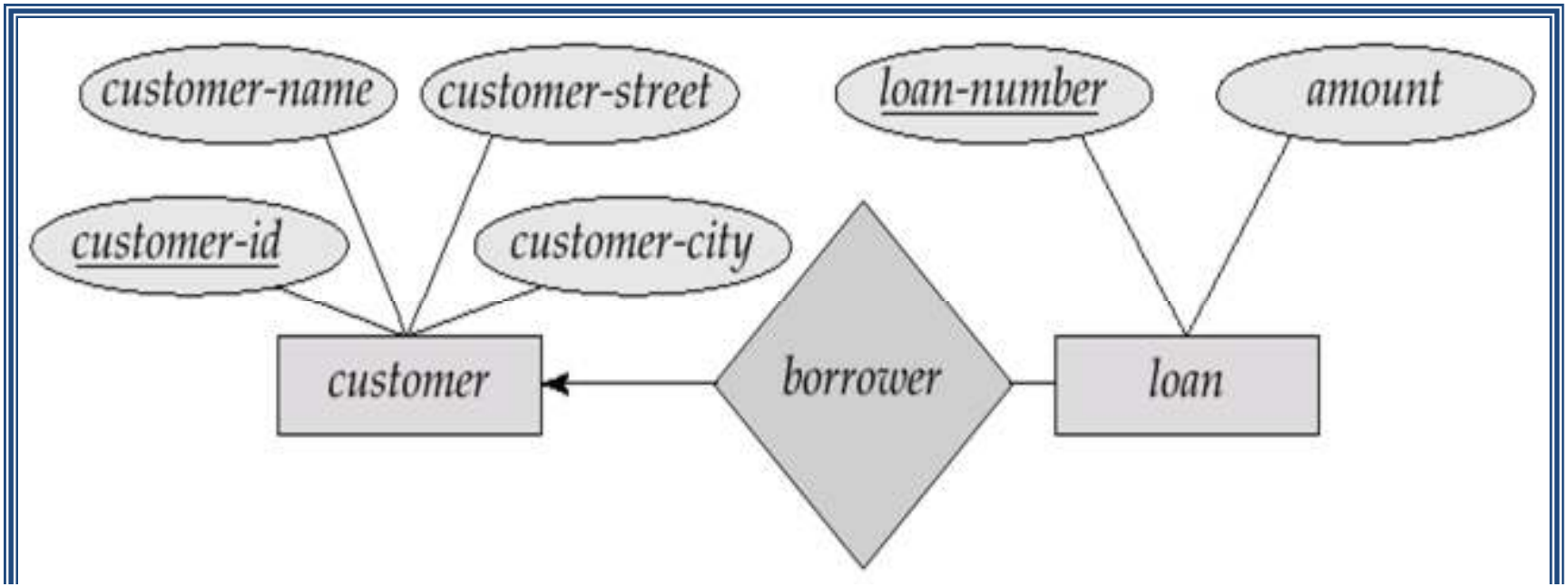
One to one relationship

- A customer is associated with at most one loan via the relationship *borrower*
- A loan is associated with at most one customer via *borrower*



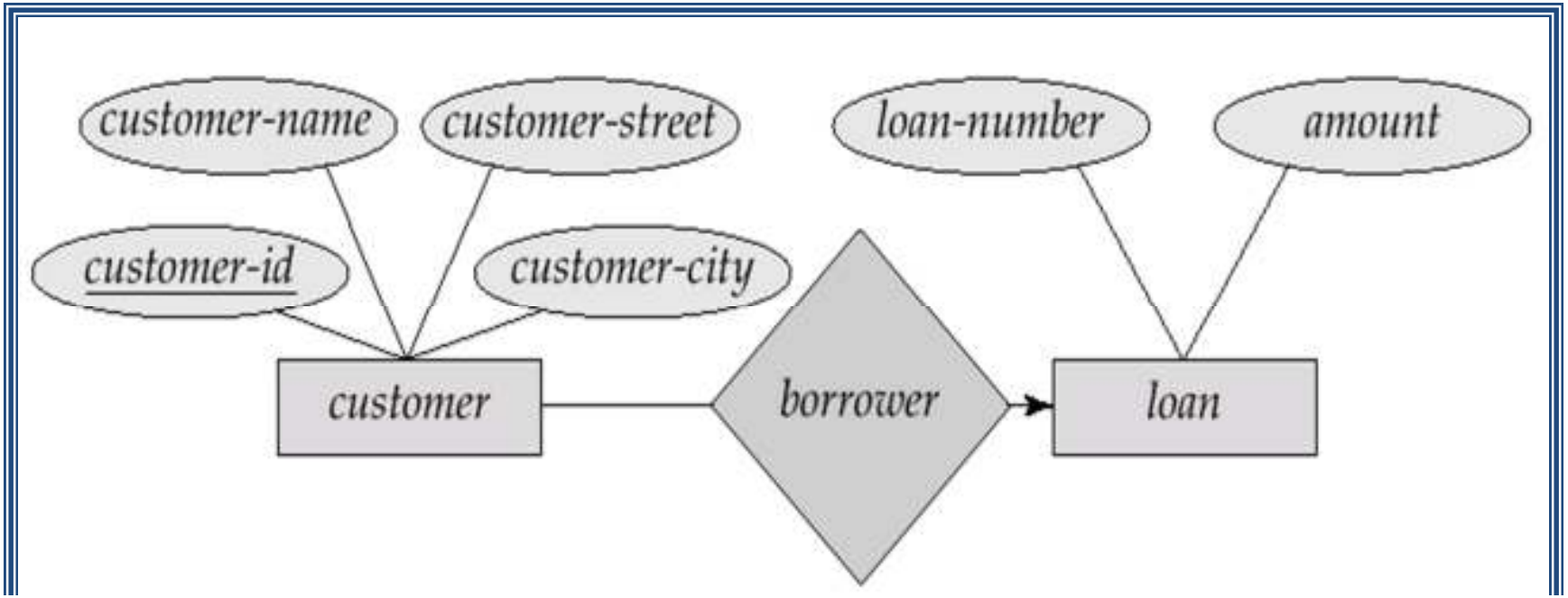
Example of Binary Relationship
One to many relationship

- A loan is associated with at most one customer via borrower,
- A customer is associated with several (including 0) loans via *borrower*



Example of Binary Relationship
Many to one relationship

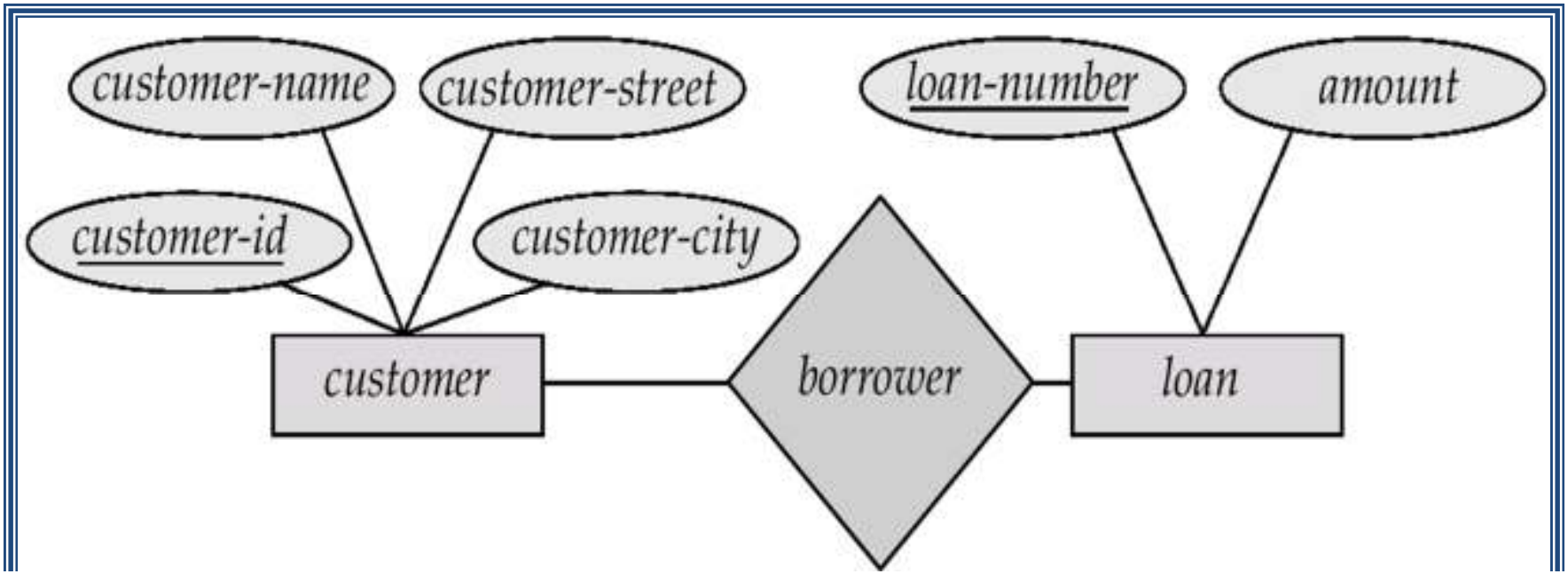
- A loan is associated with several (including 0) customers via *borrower*,
- A customer is associated with at most one loan via *borrower*



Example of Binary Relationship

Many to Many relationship

- A customer is associated with several (possibly 0) loans via borrower
- A loan is associated with several (possibly 0) customers via borrower



Types of Relationships/ Mapping Cardinality Constraints

- Types of binary relationship from entity set ‘A’ to entity set ‘B’

  one – one: an entity in A is related to

  at most one entity in B and vice versa

  many – one: an entity in A is related to

  at most one entity in B

  many – many: an entity in A is related to

  0 or more entities in B and vice versa

Cardinality constraint on a relationship

A cardinality constraint between two entities A and B, specifies the number of instances of entity B that can (or must) be associated with each instance of entity A.

- **Minimum cardinality**: the minimum number of instances of one entity that may be associated with each instance of another entity.

- **Maximum cardinality**: the maximum number of instances of one entity that may be associated with each instance of another entity.

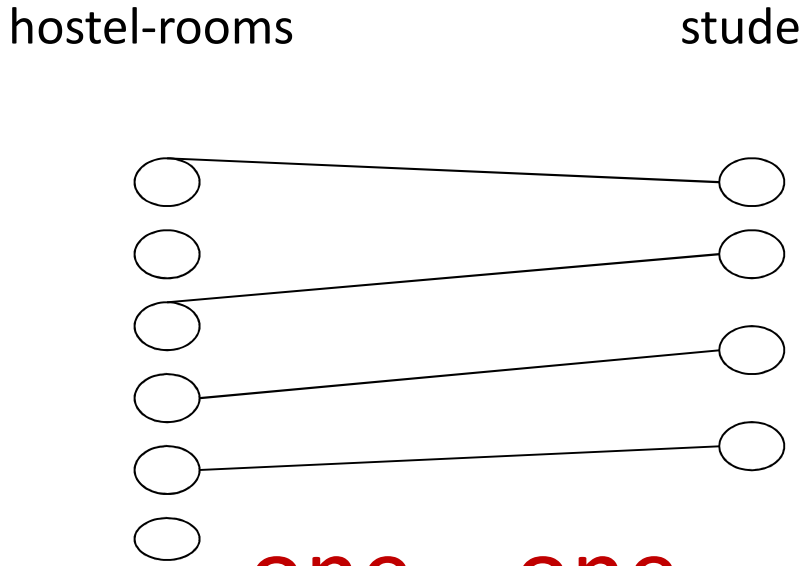
min-max constraints

- Suppose that each customer must have at least one account, but is restricted to at most two loans at a time, and that a bank branch cannot have more than 1000 loans. How does this show up as min-max constraints.
- Customer-Loan (0, 2)
- Customer-Account (1, N)
- Bank-Branch – Loan (0, 1000)

Example : One-One Relationships

Relationship Allocated between entity sets hostel-rooms and Students.

A room cannot be allocated to more than one student, and no student can have more than one room.



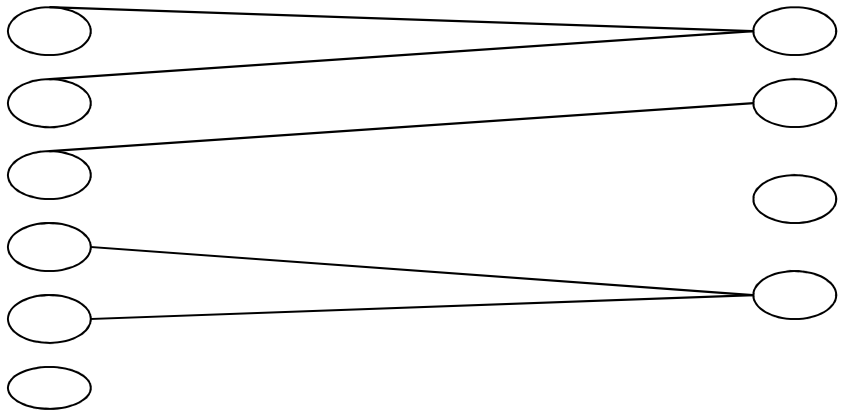
one – one

Example : Many-One Relationships

- Each entity of the first set is connected to at most one entity of the second set.
- But an entity of the second set can be connected to zero, one, or many entities of the first set.
- E.g. A student can do at most one major project and a major project can be done by more than one student

students

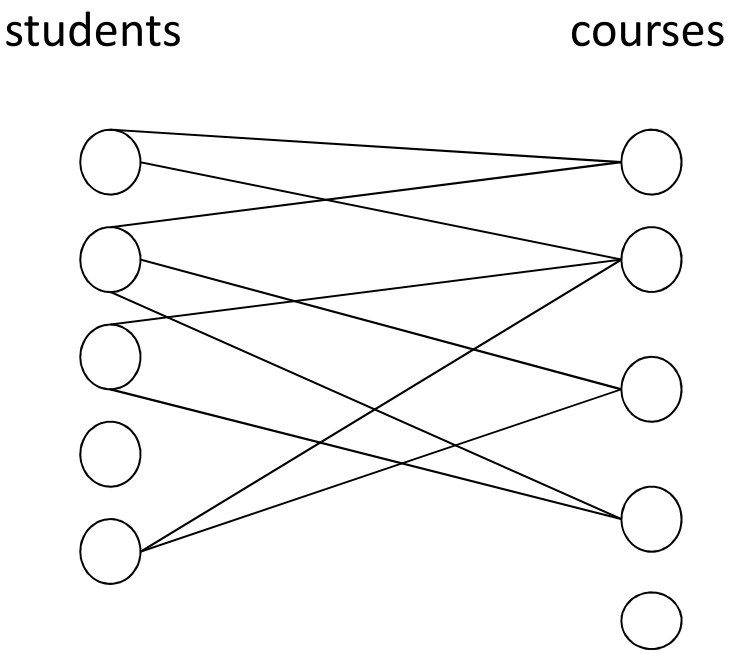
major-projects



many – one

Example : Many-Many Relationships

- Focus: binary relationships, such as **Registers** between **Students** and **Courses**.
- In a *many-many* relationship, an entity of either set can be connected to many entities of the other set.
- E.g., a student registers many courses; an instructor is allotted many courses.



many - many