UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA

Course Name : Database Management System

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Module 2 : Relationship Sets

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Relationship Sets

- A **relationship** is an association among several entities

  Example:

  44553 (Peltier) — *advisor* — 22222 (Einstein)

  student entity — relationship set — *instructor* entity

- A **relationship set** is a mathematical relation among $n \geq 2$ entities, each taken from entity sets

  $$\{(e_1, e_2, \ldots e_n) \mid e_1 \in E_1, e_2 \in E_2, \ldots, e_n \in E_n\}$$

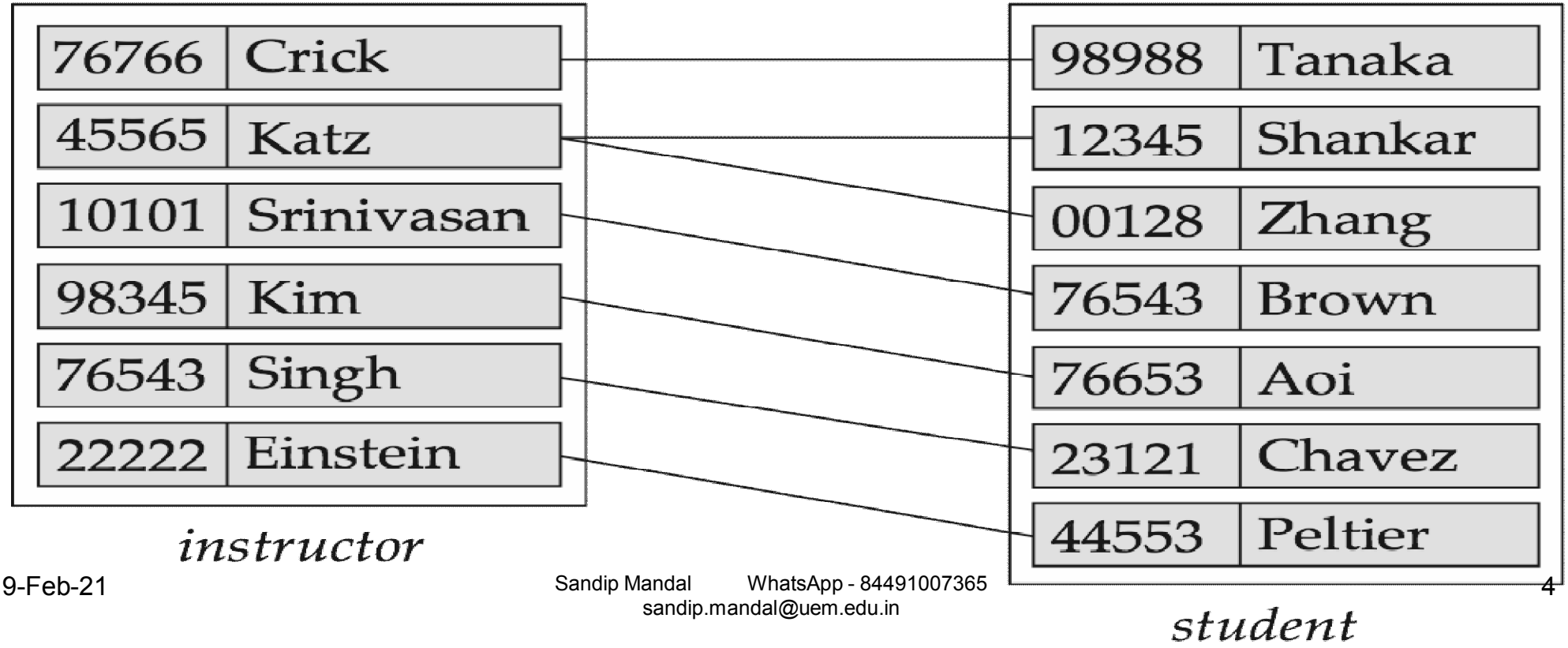
  where $(e_1, e_2, \ldots, e_n)$ is a relationship

  – Example:

  $$(44553,22222) \in advisor$$

Three components of a relationship : Name, Degree, Cardinality ratio / participation constraints

Relationship Set *advisor*



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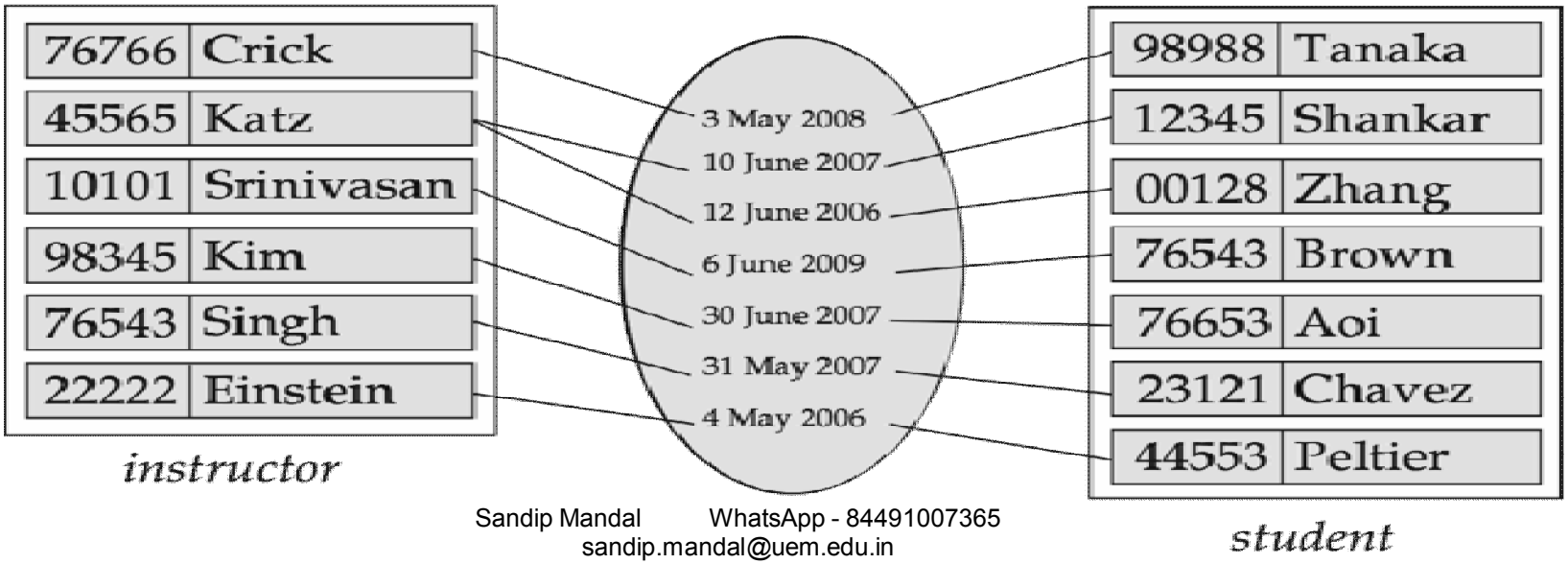
Relationship Sets (Cont.)

- An attribute can also be associated with a relationship set.
- For instance, the *advisor* relationship set between entity sets *instructor* and *student* may have **the attribute *date* which tracks when the student started being associated with the advisor**



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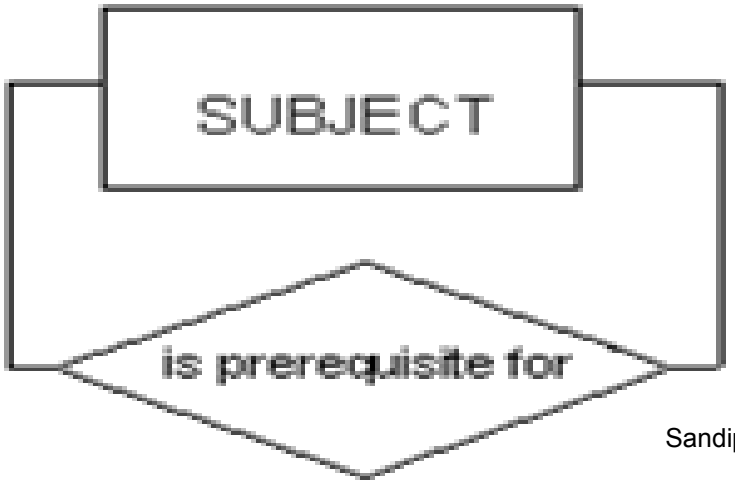
DEGREE of Relationships

1. Unary Or Recursive Relationship

A **unary relationship** is when both participants in the relationship are the same entity. E.g. Subjects may be prerequisites for other subjects.



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2. Binary Relationship

A **binary relationship** is when two entities participate, and is the most common relationship degree.

E.g. Re

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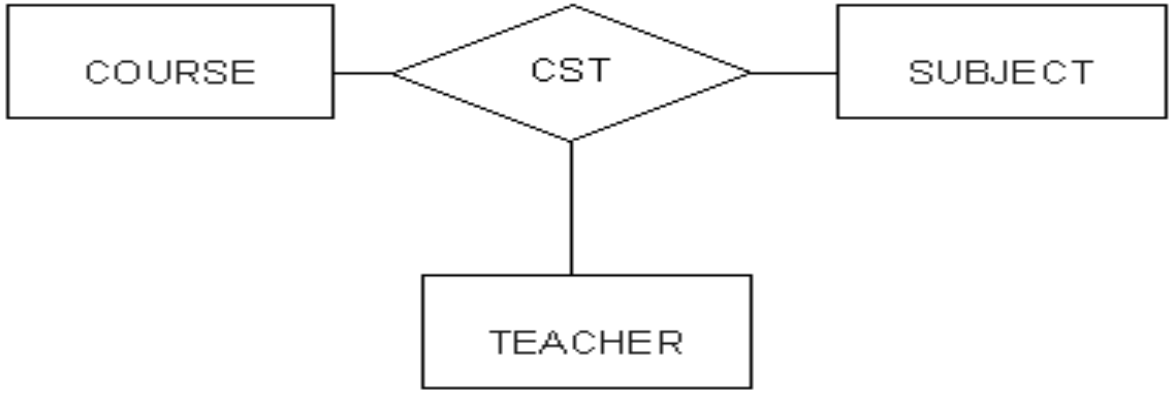
3. **Ternary Relationship**

A **ternary relationship** is when three entities participate in the relationship.



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Degree of a Relationship Set

- **Binary relationship**
  - involve two entity sets (or degree two).
  - most relationship sets in a database system are binary.

- Relationships between more than two entity sets are rare. Most relationships are binary. (More on this later.)
  - Example: *students* work on research *projects* under the guidance of an *instructor*.
  - **relationship *proj_guide* is a ternary relationship between *instructor, student,* and *project***

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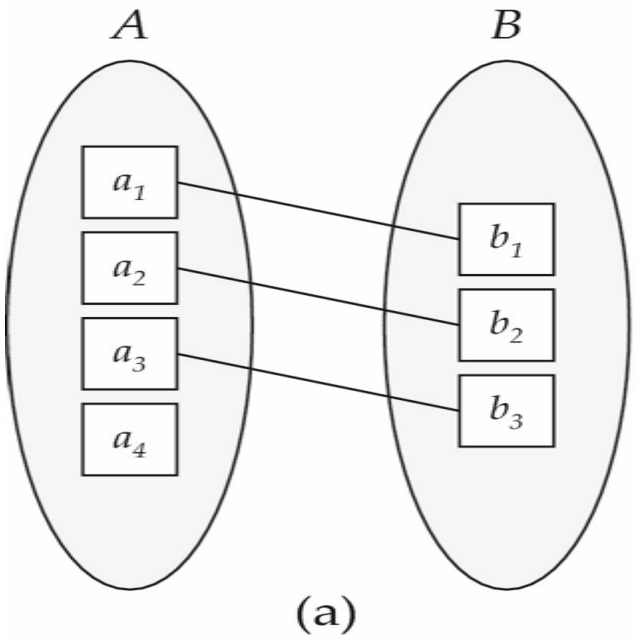
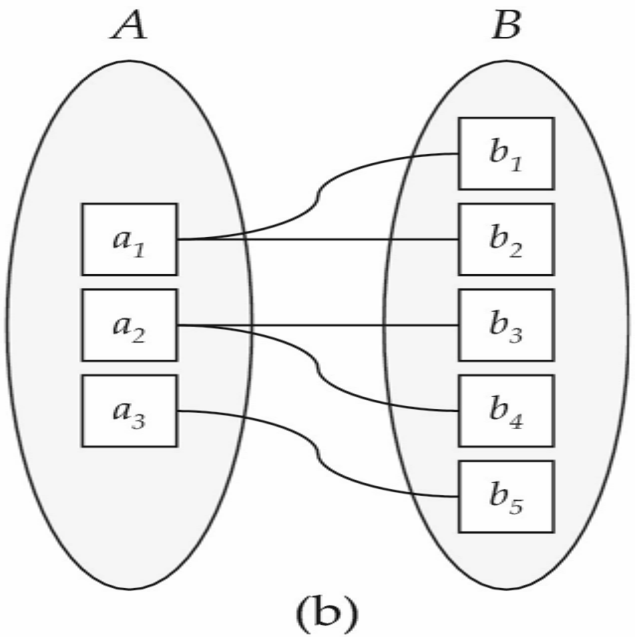
Mapping Cardinality Constraints

- **Participation Ratio**
- **Express the number of entities to which another entity can be associated via a relationship set**.
- Most useful in describing binary relationship sets.
- For a binary relationship set the mapping cardinality must be one of the following types:
  - One to one
  - One to many
  - Many to one
  - Many to many

Mapping Cardinalities



One to one



One to many

Note: Some elements in *A* and *B* may not be mapped to any elements in the other set

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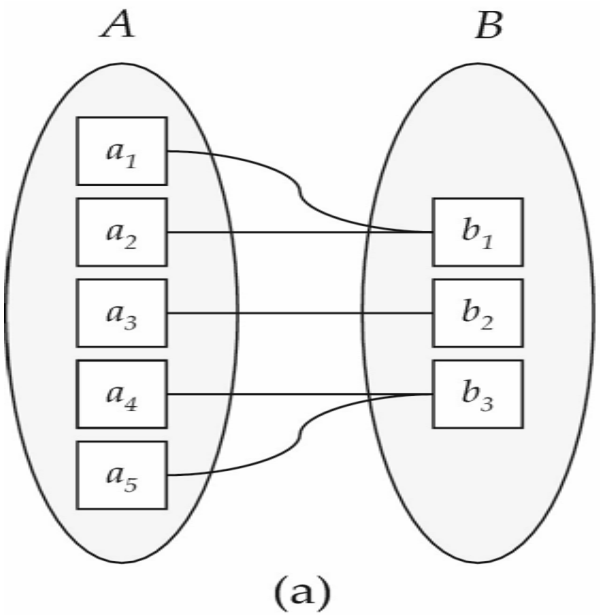
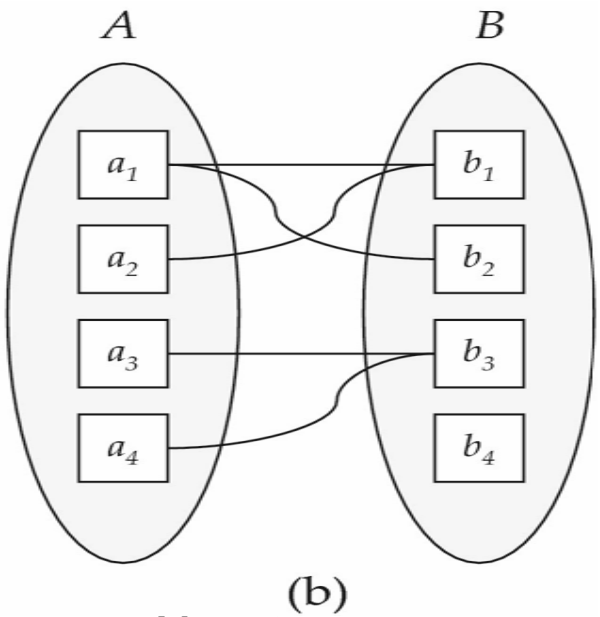
Mapping Cardinalities



Many to one



Many to many

Note: Some elements in A and B may not be mapped to any elements in the other set

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Thank You

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