SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(IoT and Cybersecurity Including BCT)

COURSE NAME : 19SB504 DATABASE MANAGEMENT SYSTEMS

III YEAR / V SEMESTER

Unit III-**E-R Diagram models and NORMAL FORMS**

Topic : ER Diagrams - Entities, Attributes, Relationships

ER Diagram-Entities

- Entity Sets:
- Entity: a “thing” or “object” in the real world that is distinguishable from all other objects.
- Example: a particular person, car, house, etc.
- An entity has set of properties, and the values for some set of properties may uniquely identify an entity.
- An entity set is a collection of entities having the same properties

ER Diagram-Attributes

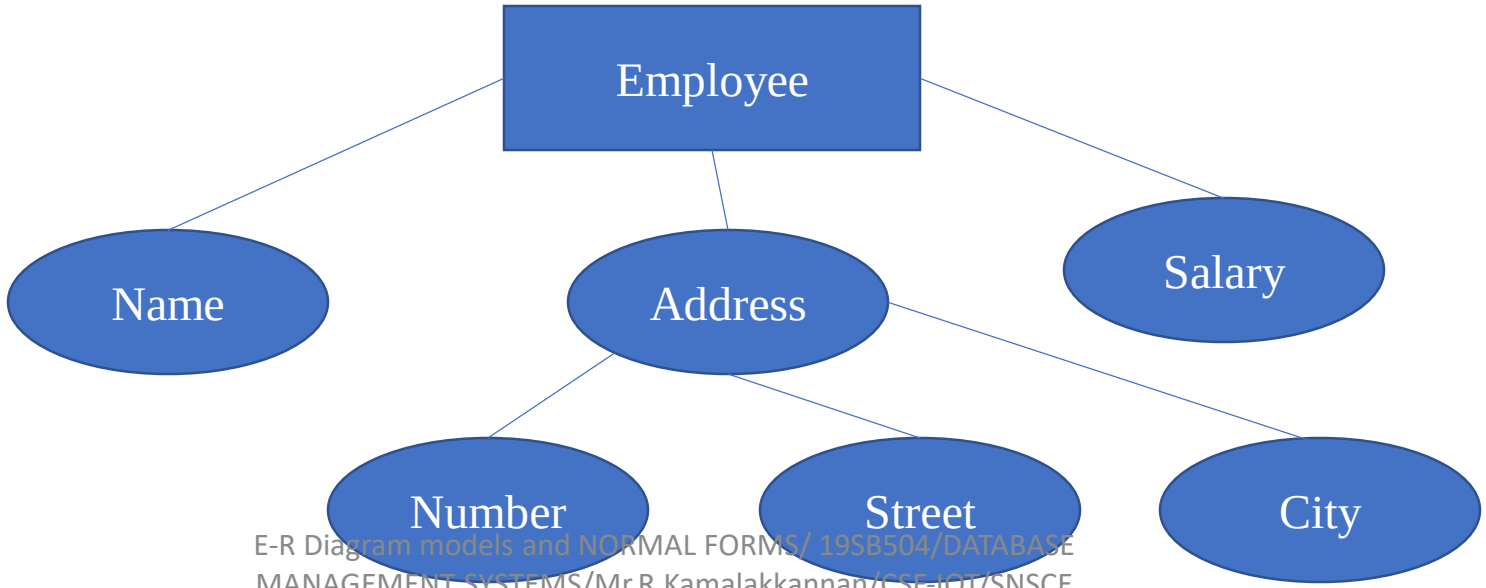
- Attributes:
  - The properties that describe an entity are called attributes.
  - In the customer entity customer id, name, street are the attributes

ER Diagram-Attributes

- Attributes – Types:
- Simple attribute:
  - An attribute that cannot be divided into further subparts (atomic).
  - Example: Customer-id of customer entity

ER Diagram-Attributes

- Attributes – Types:
- Composite attribute:
  - An attribute that can be divided into a set of subparts.

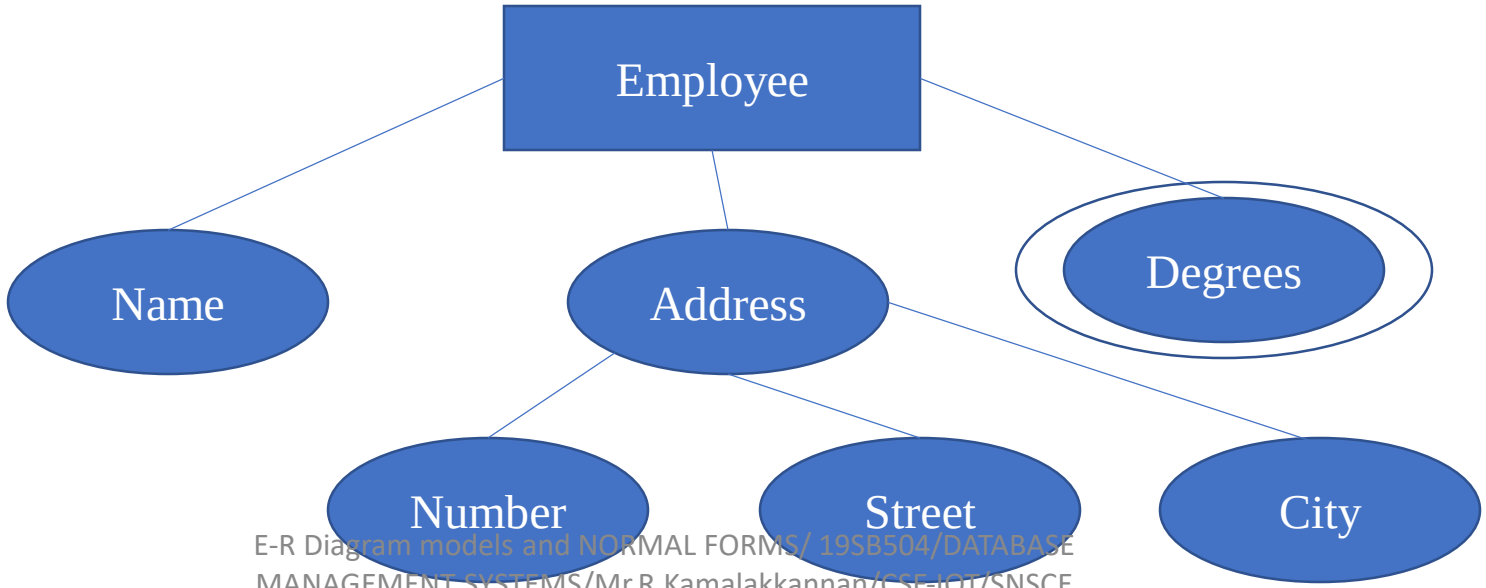


ER Diagram-Attributes

- Attributes – Types:
- Single value attribute:
  - An attribute having only one value in a particular entity.

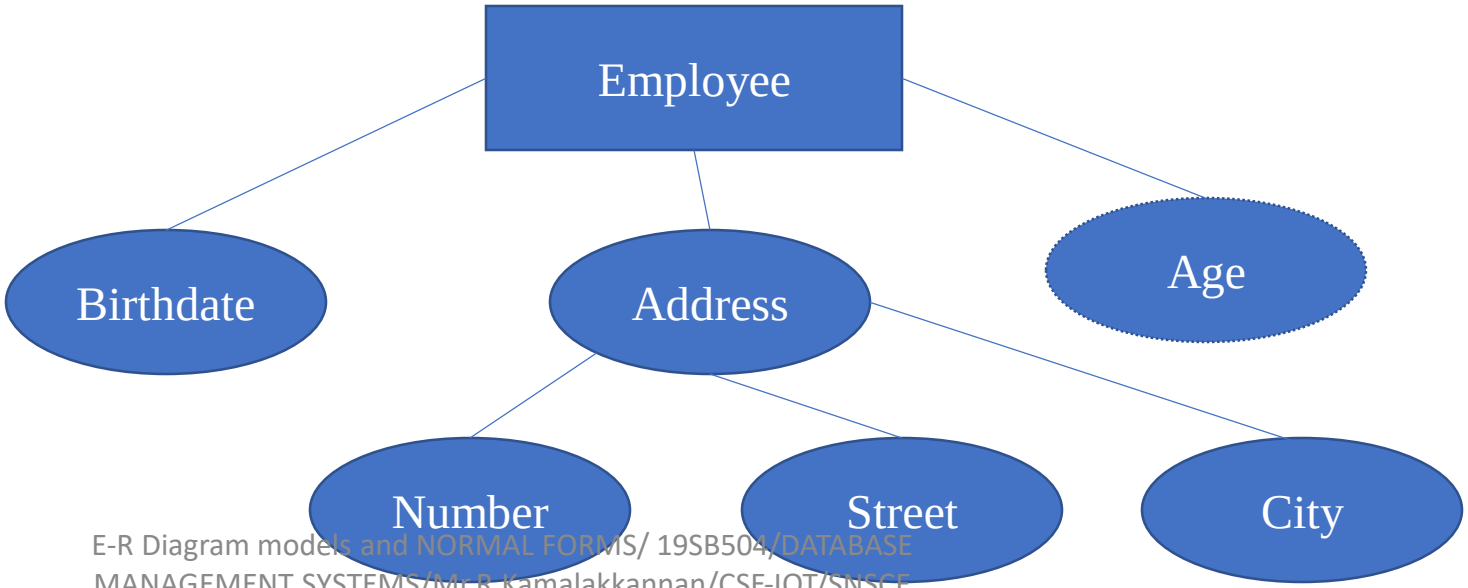
ER Diagram-Attributes

- Attributes – Types:
- Multi-valued attribute:
  - An attribute having more than one value for a particular entity.



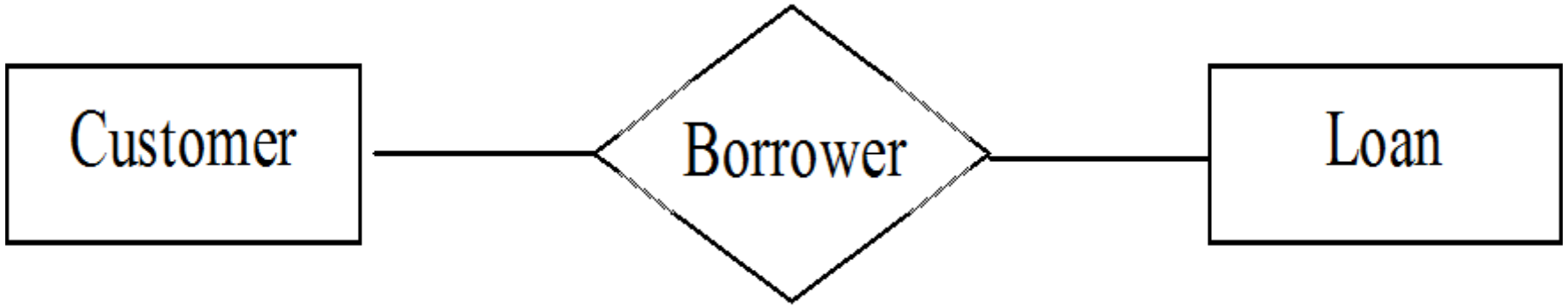
ER Diagram-Attributes

- Attributes – Types:
- Derived attribute:
  - An attribute that is derived from other related attributes or entities.



ER Diagram- Relationship

- Relationship set:
  - an association among several entities.
  - a set of relationships of the same type.



ER Model

- Mapping Cardinality:
  - the number of entities to which another entity can be associated via a relationship set.
  - For a binary relationship set R between entity sets A and B

ER Model

- Mapping Cardinality - One-to-one (1 : 1)
  - An entity in A is associated with at most one entity in B, and an entity in B is associated with at most one entity in A.
- One-to-many (1 : M)
  - An entity in A is associated with any number of entities in B. An entity in B can be associated with at most one entity in A.

ER Model

- Mapping Cardinality - Many-to-Many (M : N)
  - An entity in A is associated with any number of entities in B, and an entity in B is associated with any number of entities in A.
- Many to one (M : 1)
  - An entity in A is associated with at most one entity in B. An entity in B can be associated with any number of entities in A.

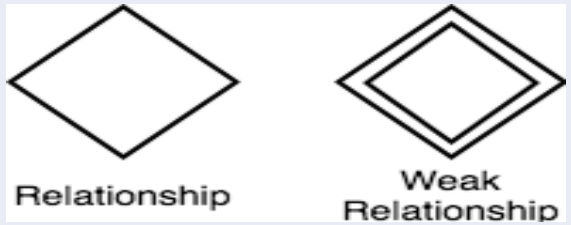
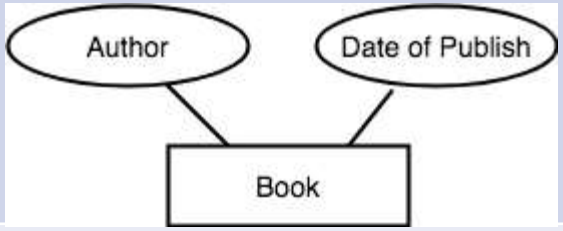
ER Model

- Ternary relation:
  - If a relationship connects three entities.
  - Entities: Product, Supplier and customer
  - Relationship: buy

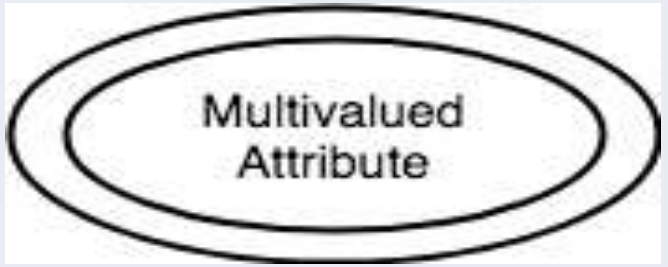
ER Model

- Weak Entity Set:
  - Entity types that do not have key attributes of their own are called weak entity types.
- Strong Entity Set:
  - Entity types that have key attributes of their own are called strong entity types

Components of ER Diagram

Component	Description	Symbol
Entity	Rectangle	
Relationship	Diamond	
Attributes for any Entity	Ellipse	
Key Attribute for any Entity	the attribute name inside the Ellipse is underlined.	

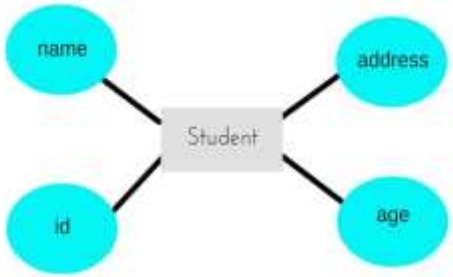
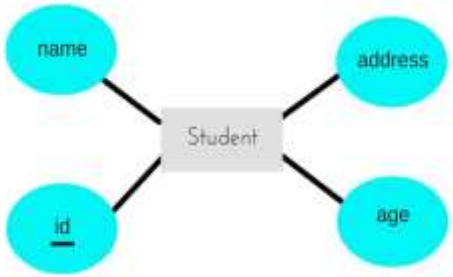
Components of ER Diagram

Component	Description	Symbol
Derived Attribute for any Entity	dotted ellipse is created inside the main ellipse	
Multivalued Attribute for any Entity	Double Ellipse	

ER Diagram - Entity

Component	Example	Symbol
Entity	Employee, Manager, Department	
Weak Entity	depends on another entity	

ER Diagram - Attribute

Component	Description	Symbol
Attribute (Name, Age, Address)	property or characteristic of an entity	
Key Attribute	main characterstic of an Entity	
Composite Attribute	have their own attributes	

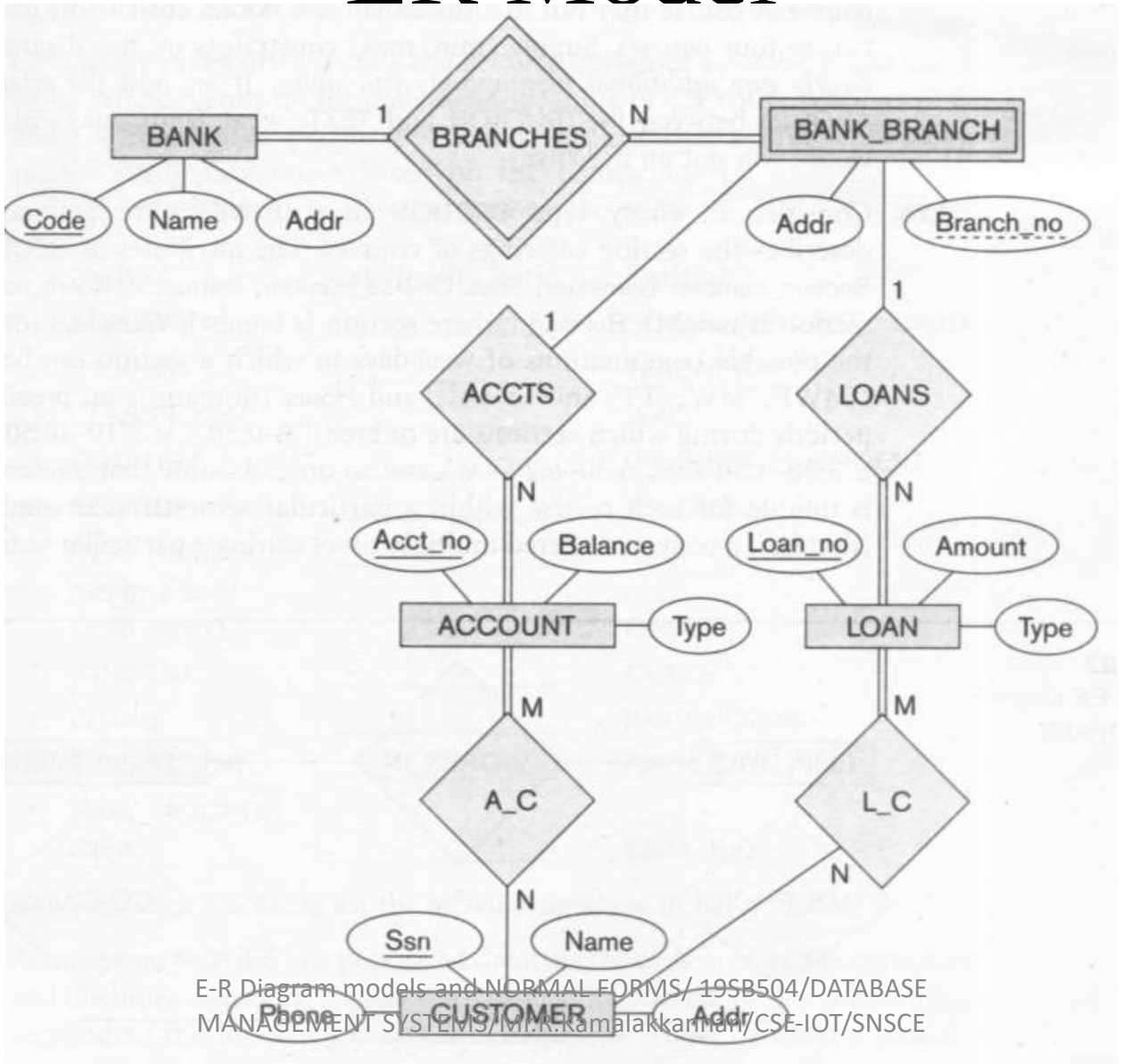
ER Diagram - Relationship

Component	Description	Symbol
One to One Relationship	one student can enroll only for one course and a course will also have only one Student	
One to Many Relationship	1 student can opt for many courses	
Many to One Relationship	Student enrolls for only one Course but a Course can have many Students	

ER Diagram - Relationship

Component	Description	Symbol
Many to Many Relationship	one student can enroll for more than one courses. And a course can have more than 1 student enrolled in it	

ER Model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Thank You.....