Birla Institute of Technology & Science Pilani, K.K Birla Goa Campus
CS-F212 Database Systems
Sem2 2020-2021
Lab 2 Reading Material - ER,EER Diagram
- Harshit, Vivek,Rahil, Tanishq, Tanmay

ER Diagram Basics

Entities aren't represented in the ER Diagram; only Entities Set can be represented in the ER diagram. Entities can be expressed in relational Model.

Attributes

Attributes are the properties which define the entity type. For example, Roll_No, Name, DOB, Age, Address, Mobile_No are the attributes which define entity type Student. In the ER diagram, the attribute is represented by an oval.

Different Kinds of Attributes:

- **Primary Key (Key Attribute)**

  The attribute which uniquely identifies each entity in the entity set is called a key attribute. For example, Roll_No will be unique for each student. In the ER diagram, the key attribute is represented by an oval with underlying lines.

- **Derived Attributes**

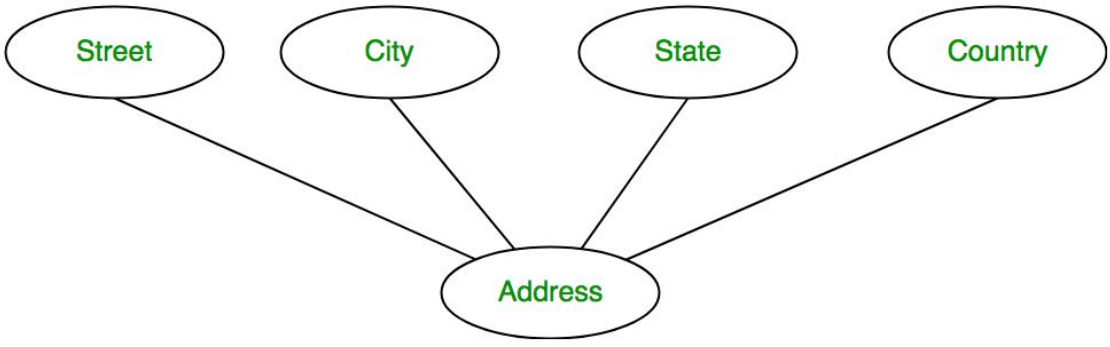
  An attribute that can be derived using other attributes in the ER diagram is called derived attributes. It is represented using dashed oval in the ER diagram.

  E.g., the Age of a student can be derived using DOB (date of birth) attribute.

- **Composite Attribute**

  An attribute composed of many other attributes is called a composite attribute—for example, the Address attribute of the student. Entity type consists of Street, City, State, and Country. The attributes that don't comprise other attributes are called Simple Attributes.

  The Composite attribute is represented by an oval comprising of ovals in the ER diagram.



- **Multivalued Attribute**

  An attribute consisting of more than one value for a given entity. For example, a student can have multiple phone numbers, so **Phone_No** attribute is a multi-valued attribute. In the ER diagram, the multi-valued attribute is represented by a double oval.

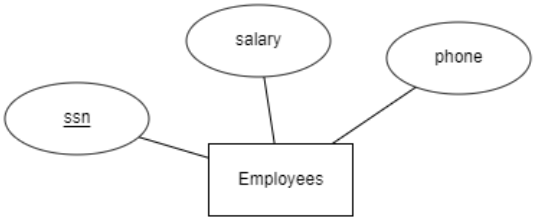
  Note: The multi-valued attribute can't be represented in a single table; we need another table to represent it. We can represent it in another table using **Foreign Key.**

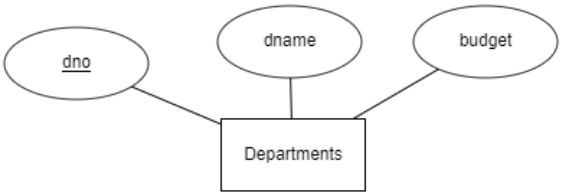
q1)

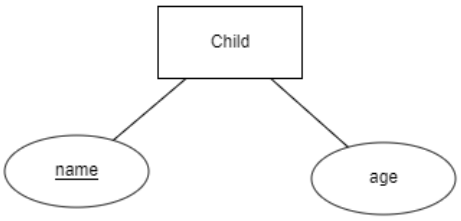
A company database needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known.Draw an ER diagram that captures this information.

Ans)

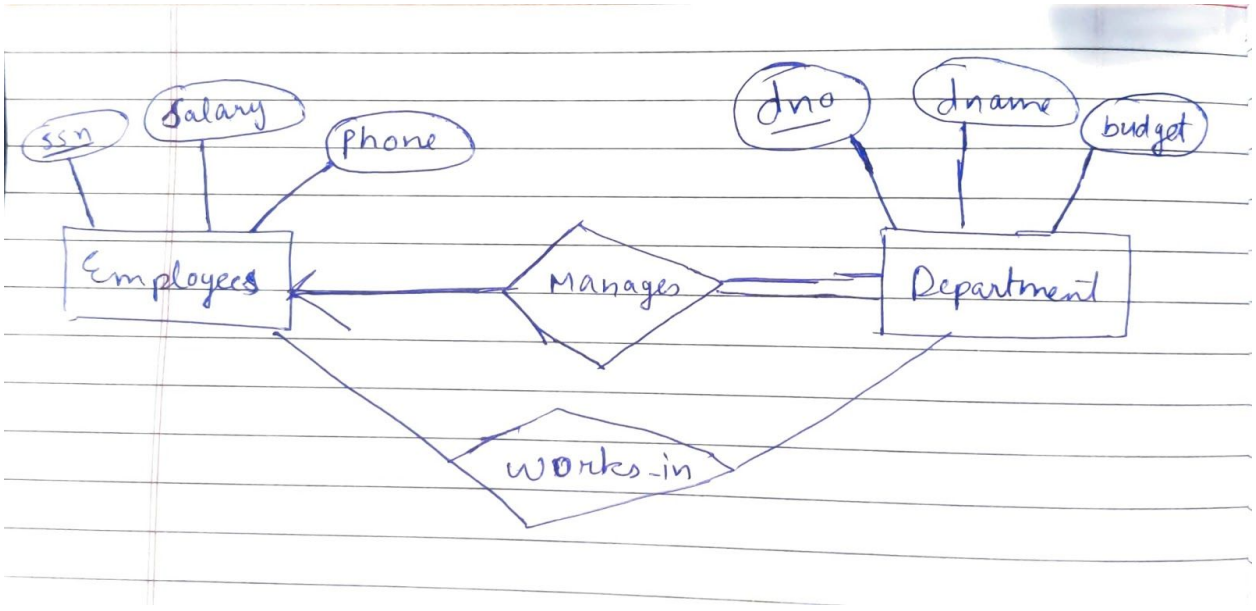
• A company database needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes).



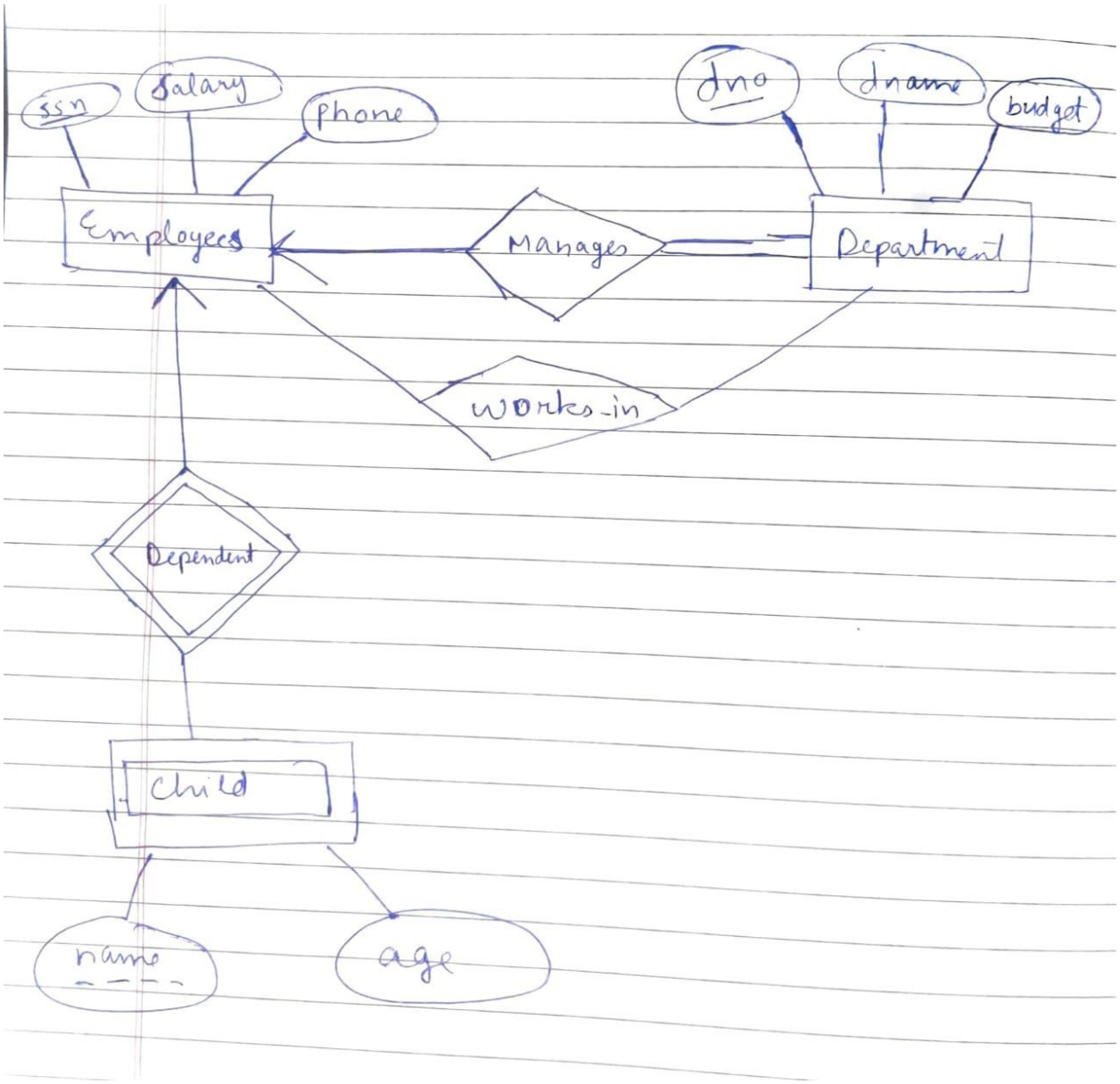




Employees work in departments;
Each department is managed by an employee

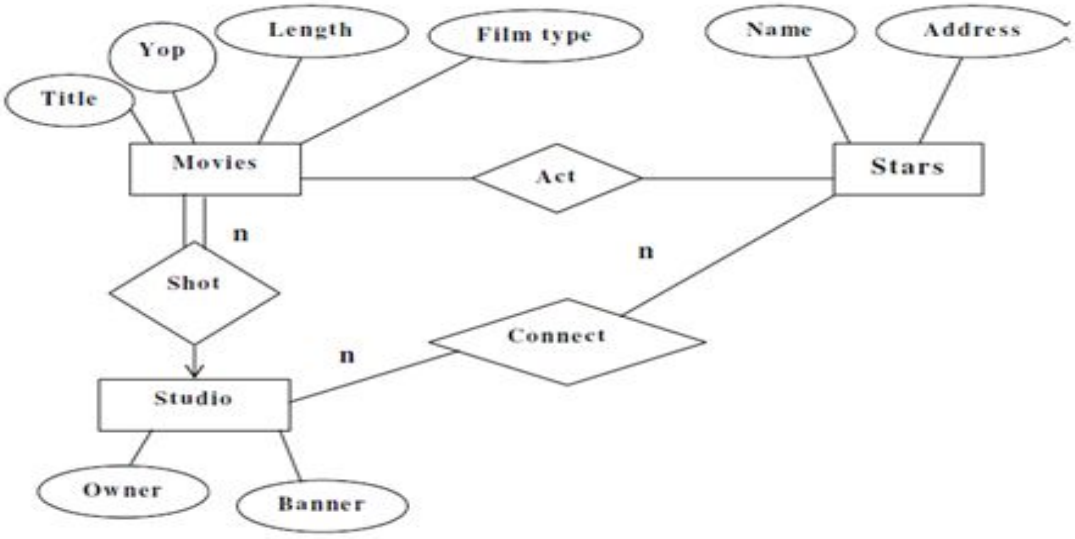


a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known



q2)
Information about films holds information about movies, stars and studios. Movies have a title, year of production, length and the film type. Stars have a name and address. Studios have a owner and a banner. Movies are shot in studios that own them. A movie is shot in just one studio. Stars are linked to one or more studios but can act in any film that may or may not be owned through the studio. Arrive at an E-R diagram. Clearly denotes attributes, keys, the cardinality ratios and participation constraints

Sol)

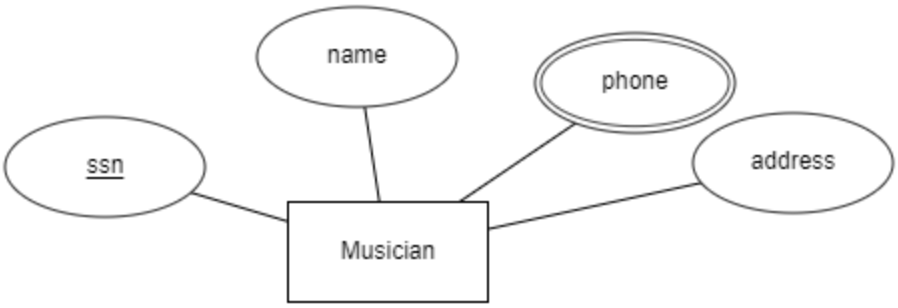


q3)
Los Angeles records has decided to store information on musicians who perform on their albums (as well as other company data) in a database. The company has chosen to hire you as a database designer.
– Each musician that records at Los Angeles has an SSN, a name, an address and a phone number. (A musician can have multiple phone no's)
– Each instrument that is used in songs recorded at Los Angeles has a id, name (e.g. guitar, synthesizer synthesizer, flute) and a musical musical key (e g. ., C, B-flat, Eflat).
– Each album that is recorded at the Los Angeles label has a title, a copyright date, a format (e.g., CD or MC) and an album identifier.
– Each song recorded recorded at Los Angeles has an id, title and an author. author.
– Each musician may play several instruments, and a given instrument may be played by several musicians.
– Each album has a number of songs on it, but no song may appear on more than one album.
– Each song is performed by one or more musicians, and a musician may perform a number of songs.
– Each album has exactly one musician who acts as its producer. A producer may produce several albums.

Draw ER Diagram for the above Scenario

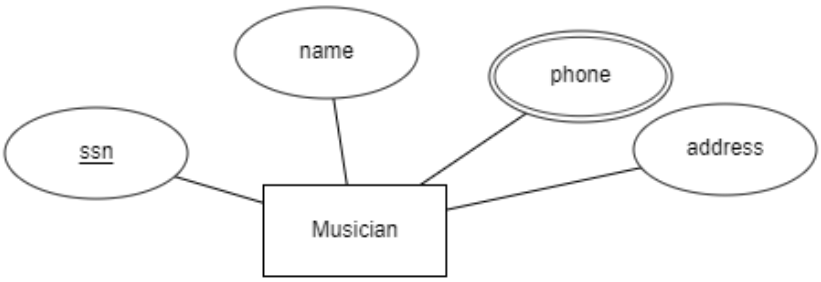
Ans)

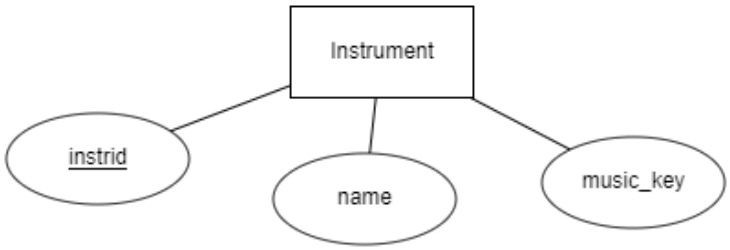
• Each musician that records at Los Angeles has an SSN, a name, an address and a phone number



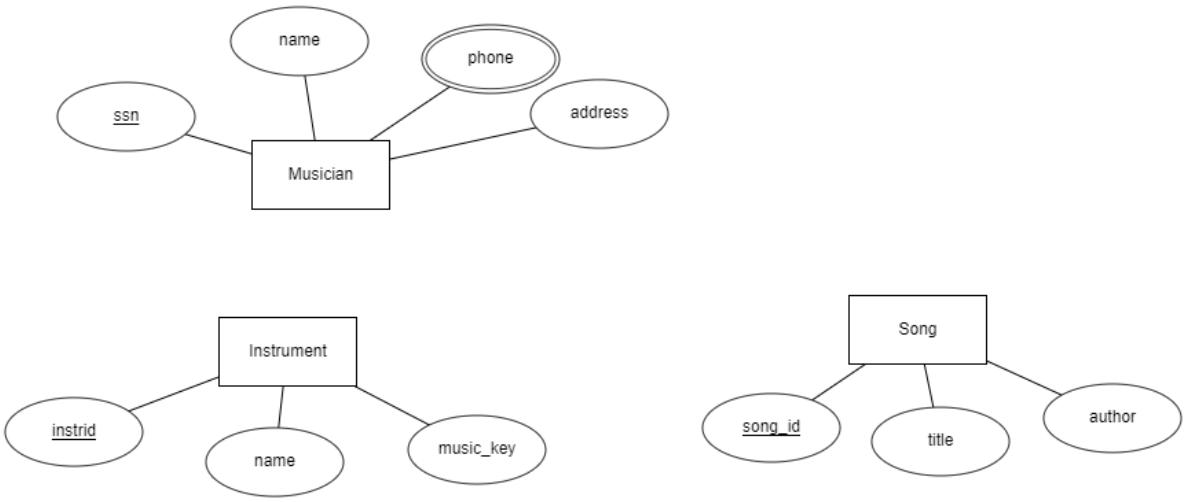
.

Each instrument that is used in songs recorded at Los Angeles has a name ,id(e.g. guitar, synthesizer, flute) and a musical key (e.g., C, B ‑flat, Eflat).

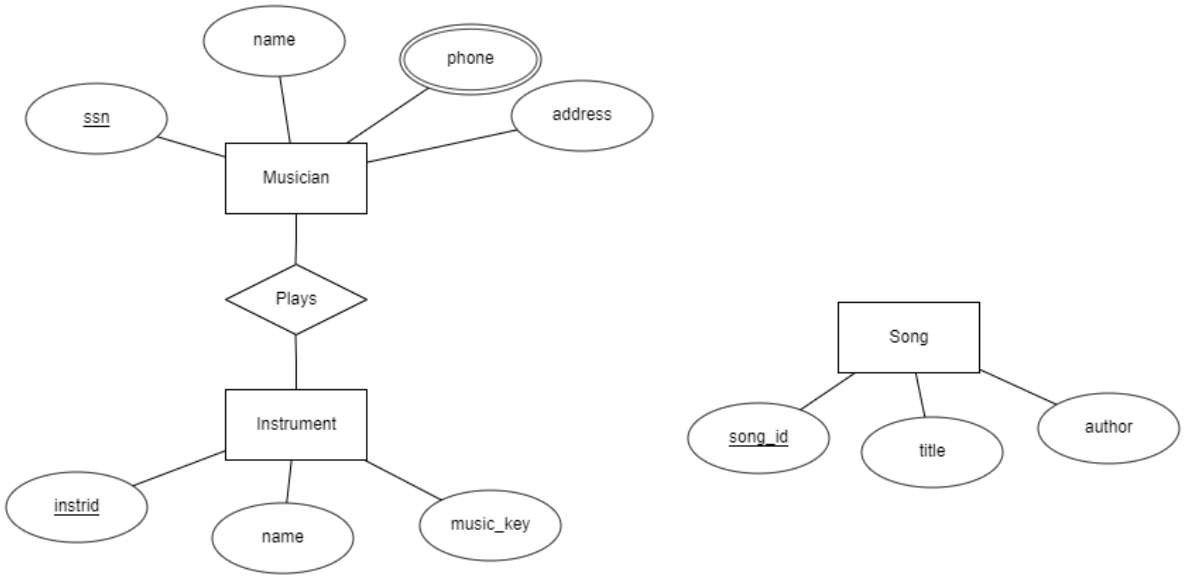




Each song recorded at Los Angeles has an id, title and an author.



Each musician may play several instruments, and a given instrument may be played by several musicians.



- Each album that is recorded at the Los Angeles label has a title, a copyright date and an album identifier.
- Each album has a number of songs on it, but no song may appear on more than one album.
- Each song is performed by one or more musicians, and a musician may perform a number of songs.
- Each album has exactly one musician who acts as its producer. A producer may produce several albums