

Symbols in ER-Diagram



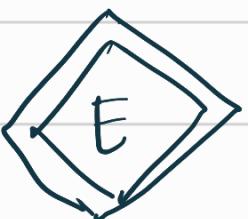
Entity Set



Weak Entity Set : Doesn't have a primary key. Has a partial key



Relationship set



Identifying relationship



Primary key



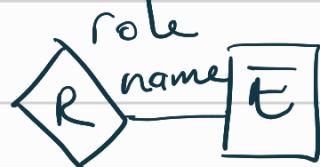
many to many relationship



one to one relationship



Many to one relationship



Role indicator



Discriminating attribute or weak entity set



Derived attribute



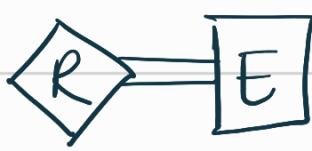
Multivalued attribute



Cardinality limits

A

attribute



Total participation of entity set in relationship

ISA

ISA (Specialization or generalization)

Keys: Super, Candidate, Primary, Alternate

Super: Combination of one or more attributes with the help of which we can uniquely identify an entity in an entity set

Consider the schema below

Student(roll, name, sex, age, address, class, section)

(class, section, roll) \Rightarrow Super key \Rightarrow Candidate key

(class, section, roll, sex) \Rightarrow Super key

(name, address) \Rightarrow Super key \Rightarrow Candidate key

Note: Schema is the logical description of a database.

Candidate: minimal super key is called a candidate key

(class, section, roll, sex) redundant

Can be a super key but not a candidate key

Primary Key: Implemented candidate key is known

as a primary key. (only one)

Alternate Key: Unimplemented candidate key (can be many)

Keys: Foreign, Partial, Secondary

Consider the following schema

Student(roll, name, sex, age, address, class, section)

Department(deptno, deptname)

Teacher(tno, tname, tage, deptno) \leftarrow FK

Employee(emphno, empname, age, sex)

Dependent(emphno, dependentname, relation)

Keys: Unique, Surrogate, Composite

Student(roll, name, sex, age, address, class, section)

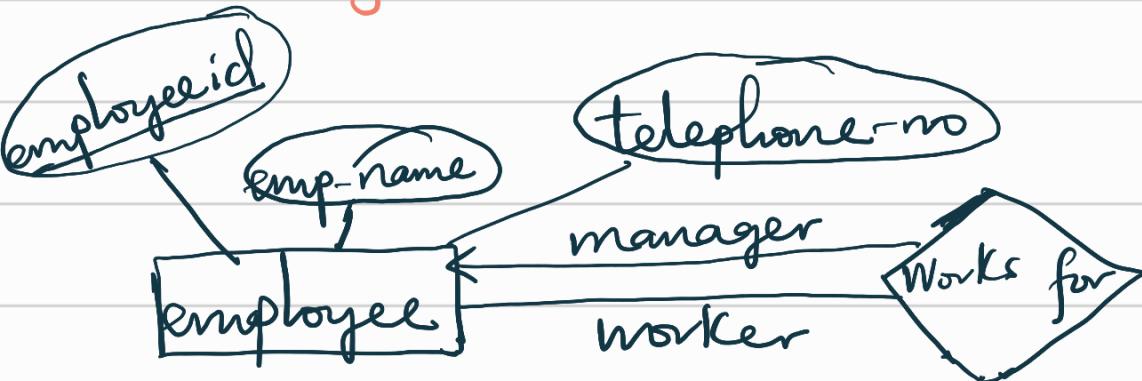
(ID card no) Unique Not updatable Null

Unique Key \checkmark \checkmark \checkmark

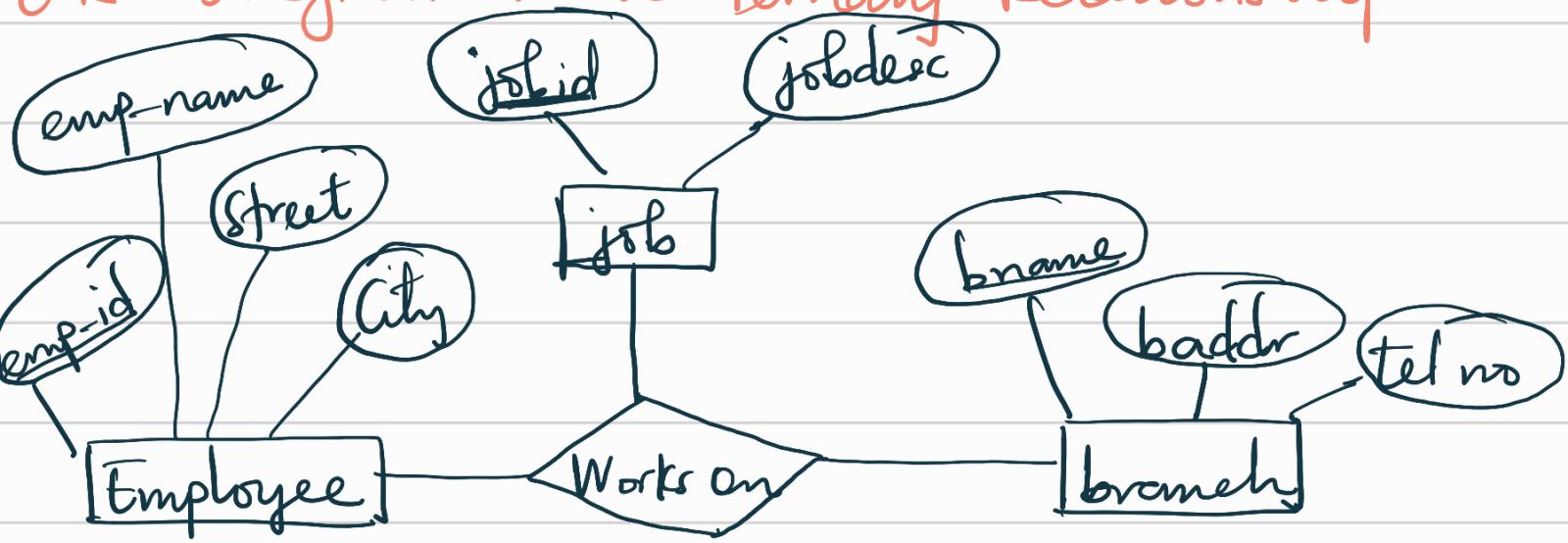
(phone number) \checkmark \times \times

Surrogate Key

Composite Key: a PK with many attributes



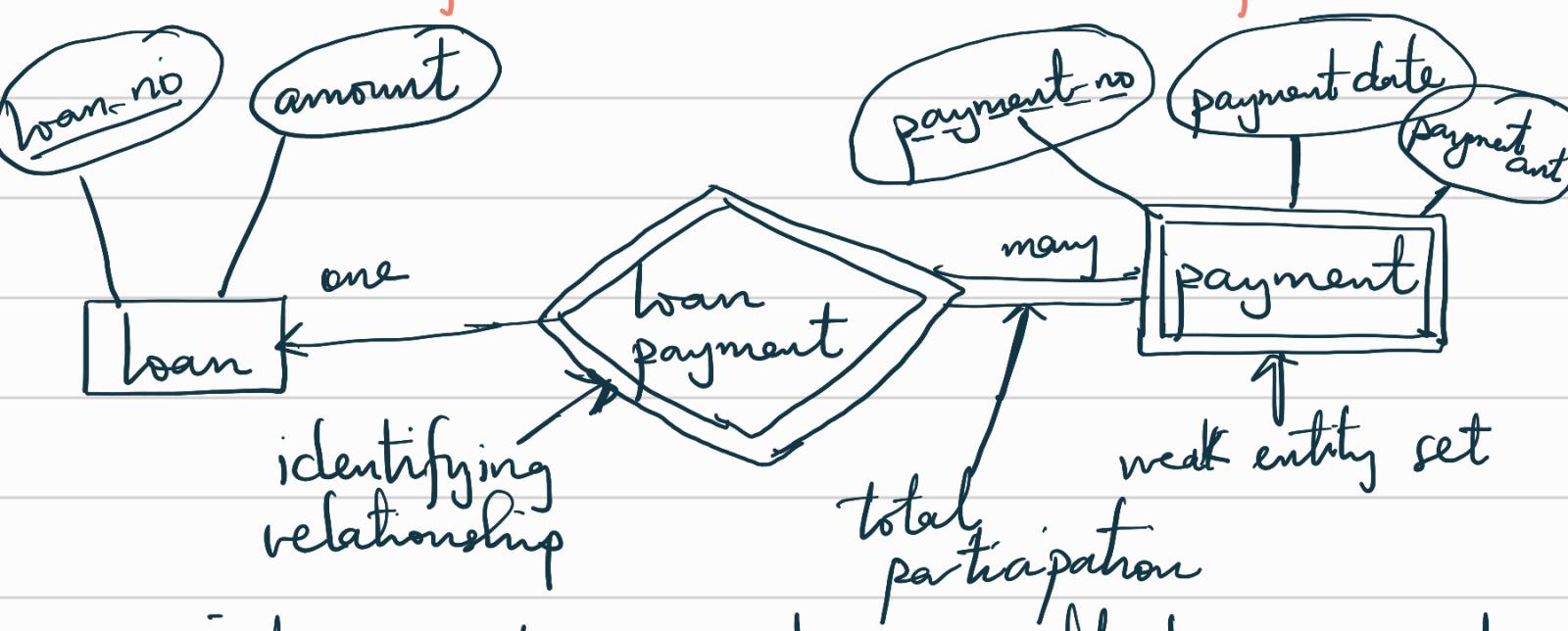
ER Diagram with Ternary Relationship



In a relationship, if we can connect

- 1) 2 entities, we call it has **binary relationship**
- 2) 3 entities, we call it has **ternary relationship**
- 3) more than 3 entities, **n any relationship**

Weak Entity Set with total Participation



→ against one loan, we have multiple payments

L1	1000000
L2	200 000
L3	150 000

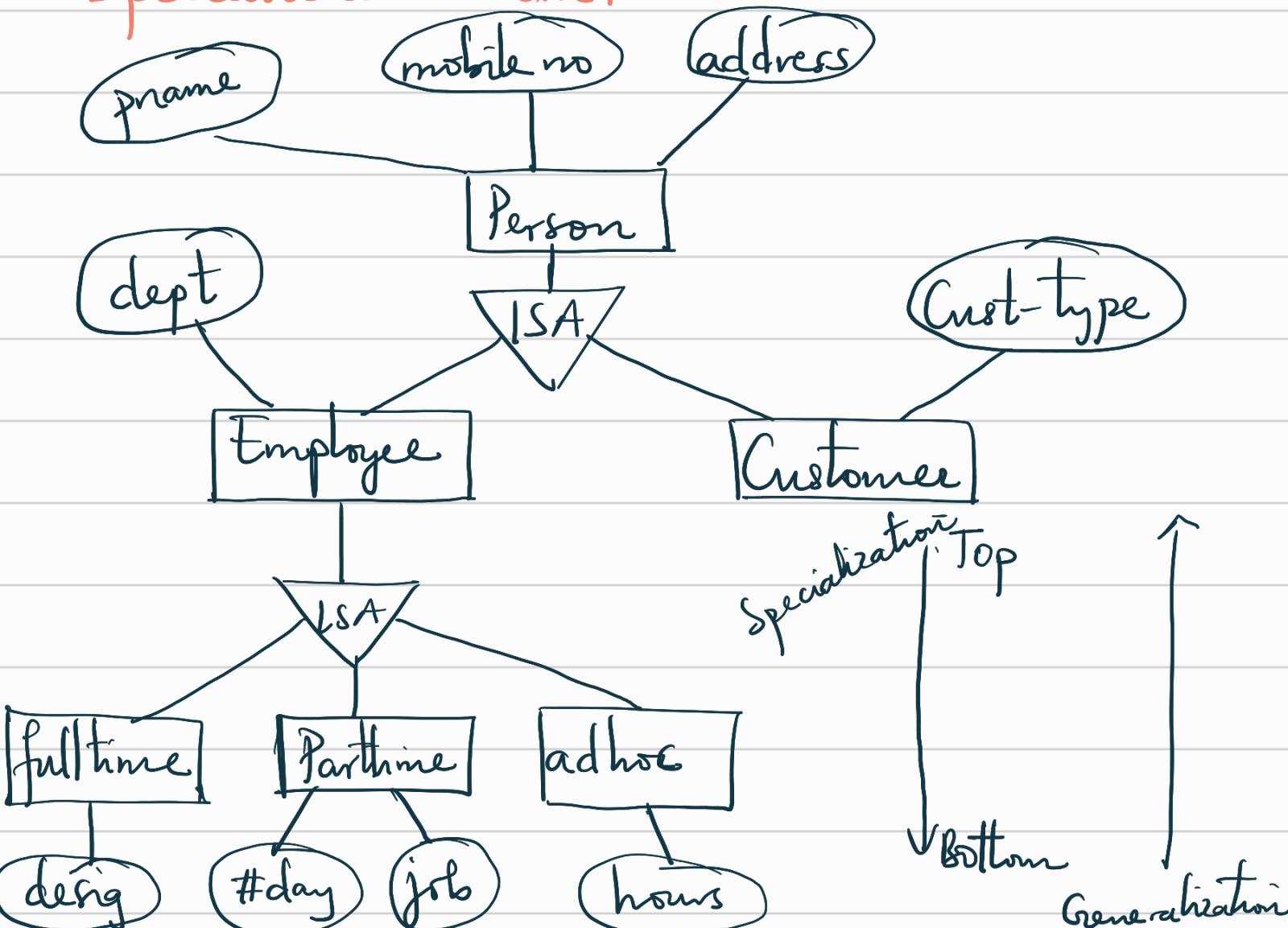
20	03/04	5000
20	03/04	5000
20	03/04	5000

one payment slip
loan (loan-number, amount)

loan-payment (loan-number, payment-no, payment-date, payment-amt)

Strong entity set

Specialization and Generalization



To form the schema, exclude all entities having ISA and apply the notion of inheritance

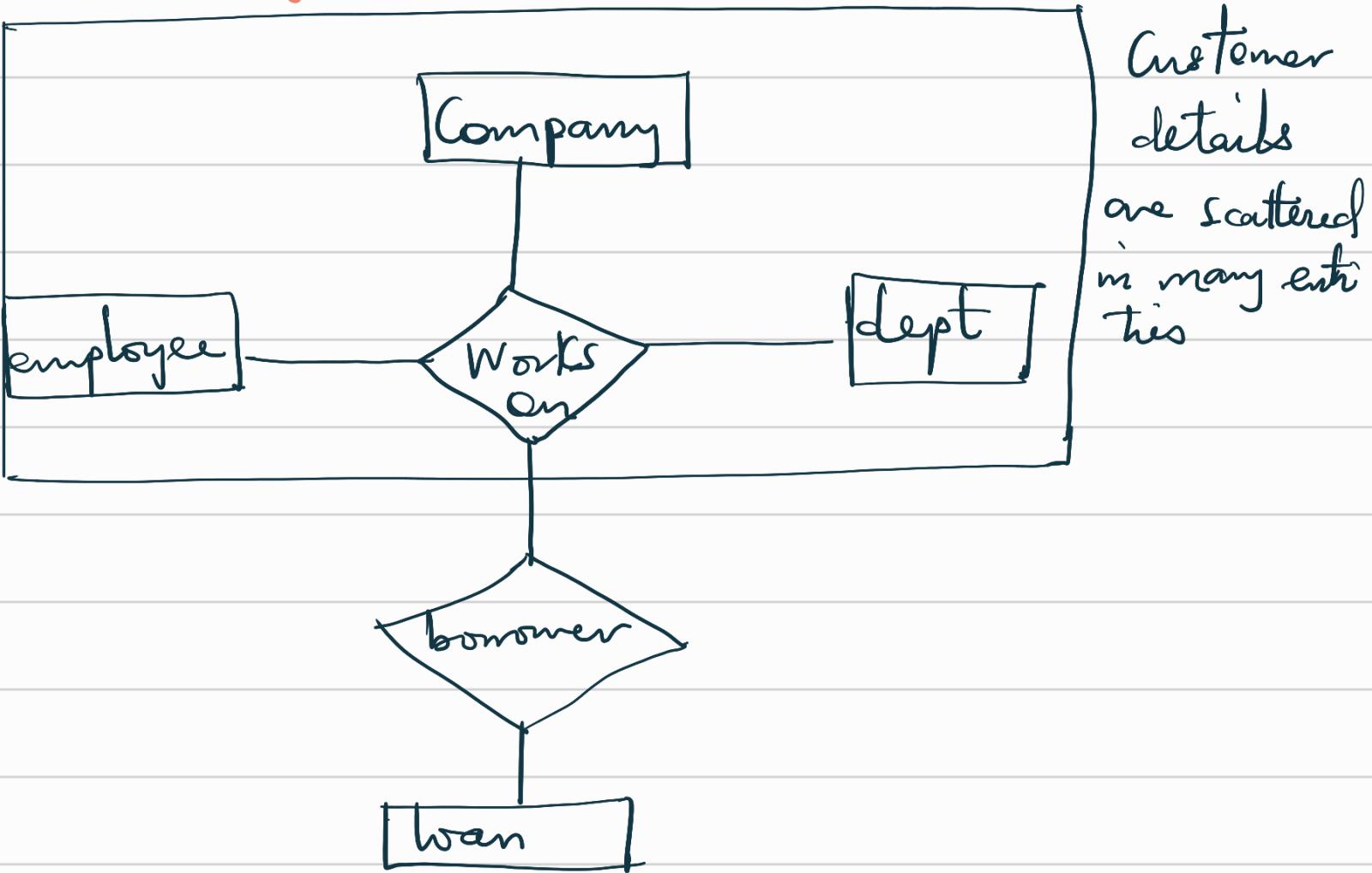
Customer (pname, mobile-no, address, cust-type)

Fulltime (pname, mobile-no, address, dept, designation)

Parttime (|| , || , || , || , tday , job)

Adhoc (|| , || , || , || , hours)

ER Diagram with aggregation



ER Diagram with existence dependency



You can not have a student existing who have not done any registration in a course.

