

Normalization

Employee Management System

Agenda

- Original Table
- 1NF
- 2NF
- 3NF
- BCNF
- ER Diagram

Original Employee Table

EID	NAME	AGE	SALARY	BASIC	HRA	TA	DA	PF	DESIGNATION	DEPARTMENT	HOD
1	Sunita	35	50000	30000	5000	2000	3000	5000	Manager	Sales	Manju
2	John	28	48000	28000	4000	2500	2000	4800	Executive	Sales	Manju
3	Raju	30	45000	25000	3500		3000	4500	Programmer	Development	Arun

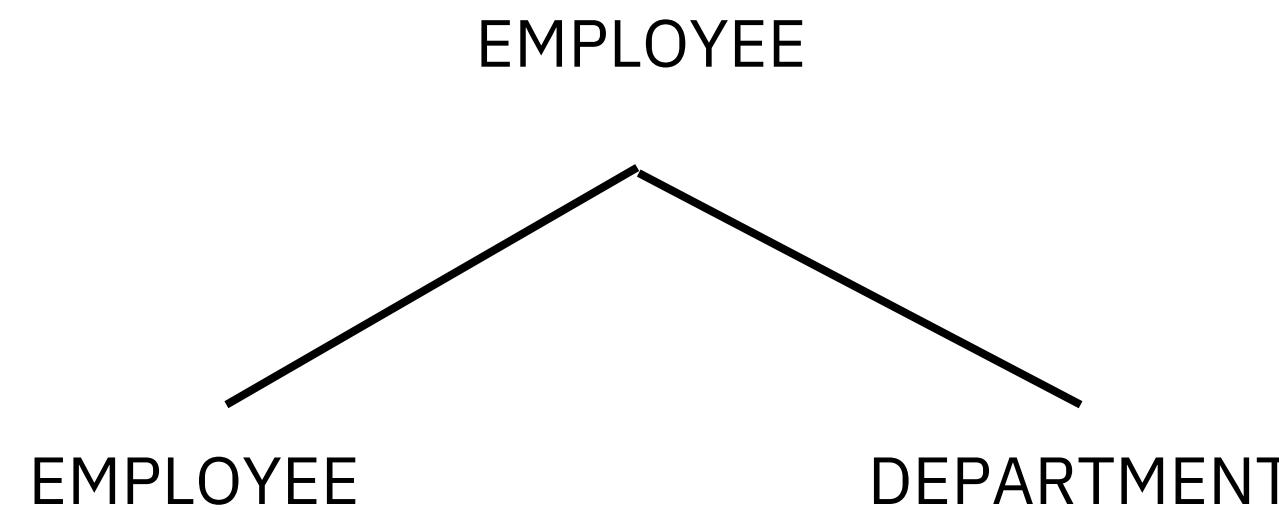
First Normal Form (1NF):

Each table cell should contain only a single value, and each column should have a unique name.

DEPARTMENT and HOD are repeated for employees from the same department.

We need to break this out into separate tables to avoid redundancy

Applying 1NF



Employee Table

EID	NAME	AGE	SALARY	BASIC	HRA	TA	DA	PF	DESIGNATION	D_ID
1	Sunita	35	50000	30000	5000	2000	300 0	5000	Manager	1
2	John	28	48000	28000	4000	2500	200 0	4800	Executive	1
3	Raju	30	45000	25000	3500		300 0	4500	Programmer	2

Department Table

D_ID	DEPARTMENT_NAME	HOD
1	Sales	Manju
2	Development	Arun

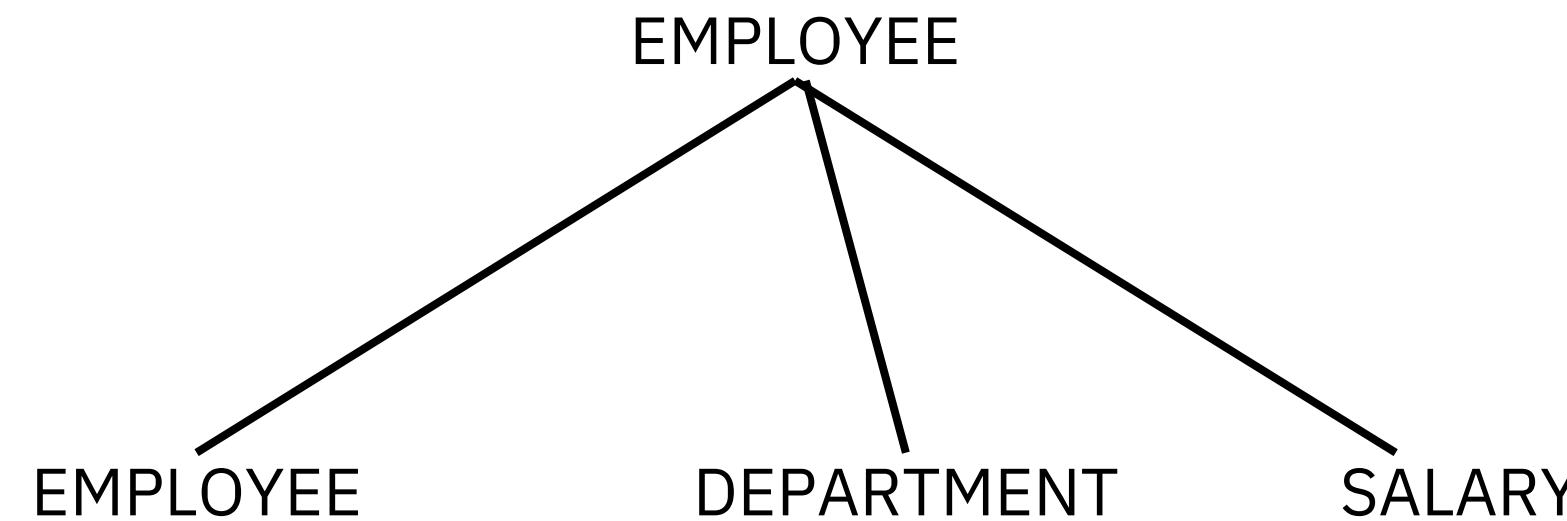
Second Normal Form (2NF):

Each non-key attribute be dependent on the primary key
Each column should be directly related to the primary key, and not to other columns.

BASIC, HRA, TA, DA, and PF depend on EID, but not necessarily on the combination of other attributes (e.g., DESIGNATION)

We should separate these components into a different table to avoid partial dependencies.

Applying 2NF



Employee Table

EID	NAME	AGE	SALARY	DESIGNATION	D_ID
1	Sunita	35	50000	Manager	1
2	John	28	48000	Executive	1
3	Raju	30	45000	Programmer	2

Salary Table

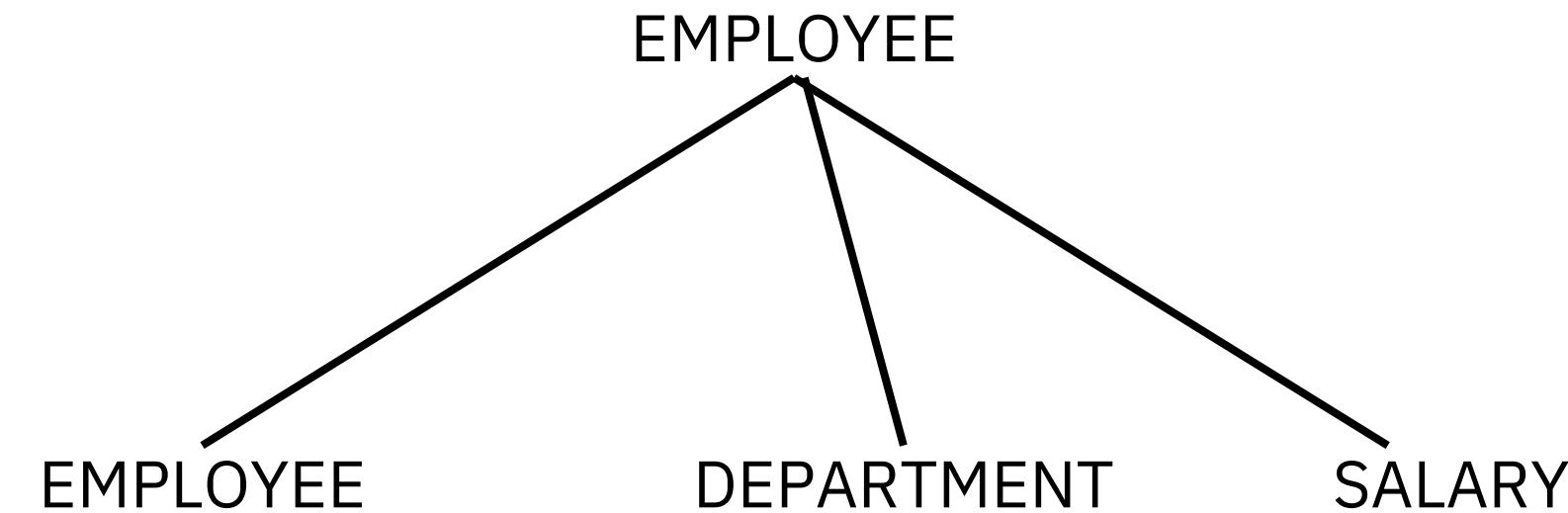
EID	BASIC	HRA	TA	DA	PF
1	30000	5000	2000	3000	5000
2	28000	4000	2500	2000	4800
3	25000	3500		3000	4500

Third Normal Form (3NF):

All non-key attributes are independent of each other.
Each column should be directly related to the primary key, and not to any other columns in the same table.

The HOD in the DEPARTMENT table is an employee who has an EID, but HOD's personal details (like NAME and AGE) are stored in the DEPARTMENT table, which leads to a transitive dependency.

Applying 3NF



Department Table

D_ID	DEPARTMENT_NAME	HOD	HOD_EID
1	Sales	Manju	4
2	Development	Arun	5

Boyce-Codd Normal Form :

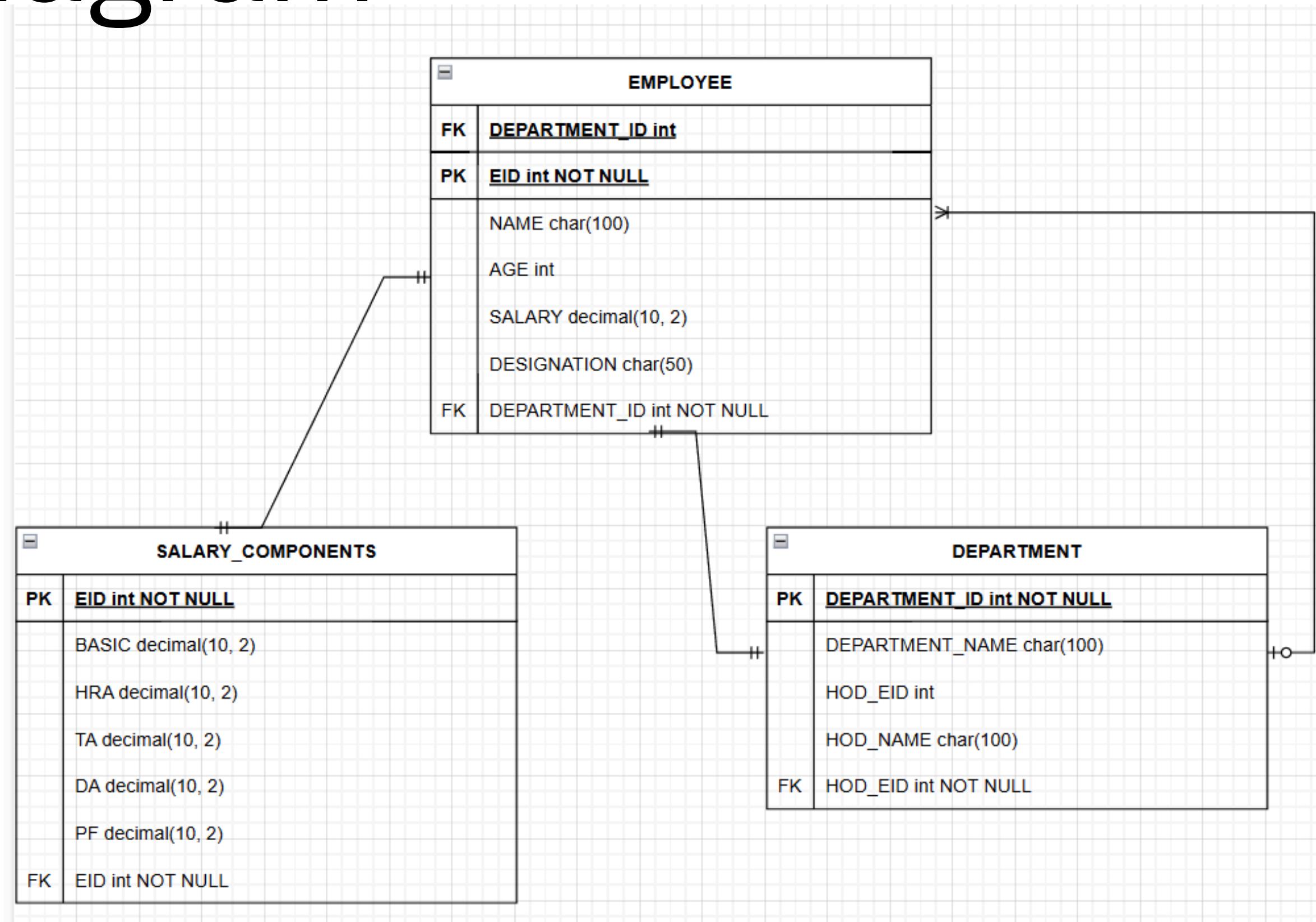
Each determinant in a table is a candidate key.

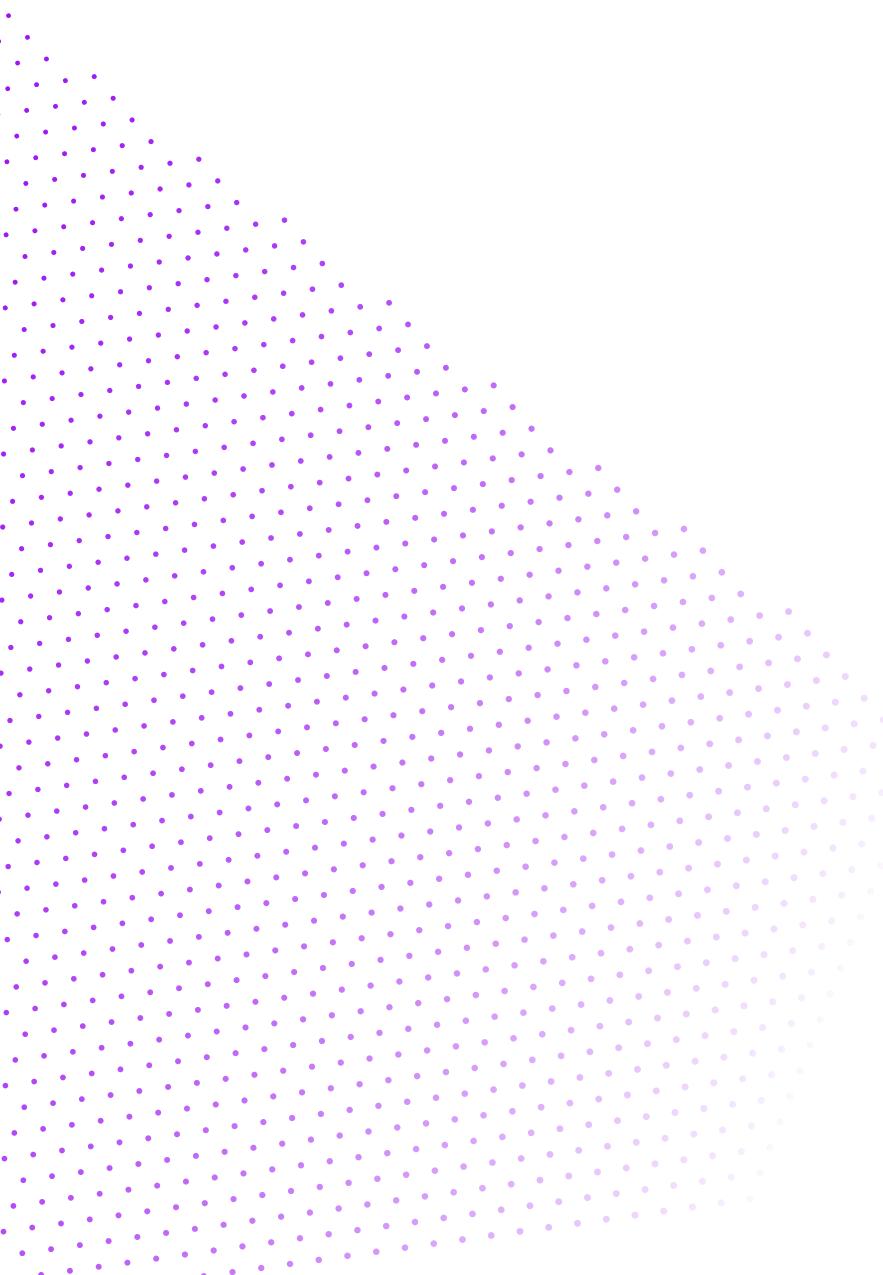
Each non-key attribute is dependent only on the candidate key.

We already have BCNF because all the dependencies are on candidate keys (primary keys)

Applying BCNF

ER Diagram





Thank You