



# **NORMALIZATION OF THE EMPLOYEE TABLE**

# STEP 1: UNNORMALIZED FORM (UNF)

## Issues in the Original Table

EID	NAME	AGE	SALARY	BASIC	HRA	TA	DA	PF	DESIGNATION	DEPARTMENT	HOD
101	Alice	30	50,000	25,000	10,000	5,000	5,000	5,000	Engineer	IT	Dr. Sharma
102	Bob	35	70,000	35,000	15,000	7,000	7,000	6,000	Manager	Finance	Dr. Gupta
103	Charlie	40	60,000	30,000	12,000	6,000	6,000	6,000	HR	HR	Dr. Mehta

## Problems in UNF:

- Salary components (BASIC, HRA, TA, DA, PF) depend on SALARY.
- DEPARTMENT → HOD (Transitive dependency).
- DESIGNATION is mixed with employee data.
- No primary key is defined.

# STEP 2: CONVERT TO 1NF (FIRST NORMAL FORM)

## ✓ Rules for 1NF:

- No repeating groups or multivalued attributes.
- Each column contains atomic values.

**Given table is already in 1NF because it contains atomic values.**

# STEP 3: CONVERT TO 2NF (SECOND NORMAL FORM)

## ✓ Rules for 2NF:

- Table must be in 1NF.
- No partial dependency (i.e., non-key attributes should depend on the entire primary key, not just a part of it).

## 🎯 Issues in 1NF:

- DEPARTMENT → HOD (HOD depends on DEPARTMENT, not EID).
- DESIGNATION details should be in a separate table.

### Employee Table (Updated)

EID	NAME	AGE	BASIC	HRA	TA	DA	PF	DESIGNATION_ID	DEPARTMENT_ID
101	Alice	30	25,000	10,000	5,000	5,000	5,000	1	1
102	Bob	35	35,000	15,000	7,000	7,000	6,000	2	2
103	Charlie	40	30,000	12,000	6,000	6,000	6,000	3	3

### Designation Table

DESIGNATION_ID	DESIGNATION
D1	Engineer
D2	Manager
D3	HR

### Department Table

DEPARTMENT_ID	DEPARTMENT	HOD
IT	IT	Dr. Sharma
Finance	Finance	Dr. Gupta
HR	HR	Dr. Mehta

# STEP 4: CONVERT TO 3NF (THIRD NORMAL FORM)

## ✓ Rules for 3NF:

- Table must be in 2NF.
- No transitive dependency (i.e., non-key attributes should depend only on the primary key).

## 🎯 Issue in 2NF:

- SALARY depends on BASIC, HRA, TA, DA, PF, meaning there's a transitive dependency.

## Employee Table (Updated)

EID	NAME	AGE	DESIGNATION_ID	DEPARTMENT_ID
101	Alice	30	1	1
102	Bob	35	2	2
103	Charlie	40	3	3

## Salary Table

EID	BASIC	HRA	TA	DA	PF
101	25,000	10,000	5,000	5,000	5,000
102	35,000	15,000	7,000	7,000	6,000
103	30,000	12,000	6,000	6,000	6,000

# ALL TABLES

## Employee Table (Updated)

EID	NAME	AGE	DESIGNATION_ID	DEPARTMENT_ID
101	Alice	30	1	1
102	Bob	35	2	2
103	Charlie	40	3	3

## Salary Table

EID	BASIC	HRA	TA	DA	PF
101	25,000	10,000	5,000	5,000	5,000
102	35,000	15,000	7,000	7,000	6,000
103	30,000	12,000	6,000	6,000	6,000

## Designation Table

DESIGNATION_ID	DESIGNATION
D1	Engineer
D2	Manager
D3	HR

## Department Table

DEPARTMENT_ID	DEPARTMENT	HOD
IT	IT	Dr. Sharma
Finance	Finance	Dr. Gupta
HR	HR	Dr. Mehta



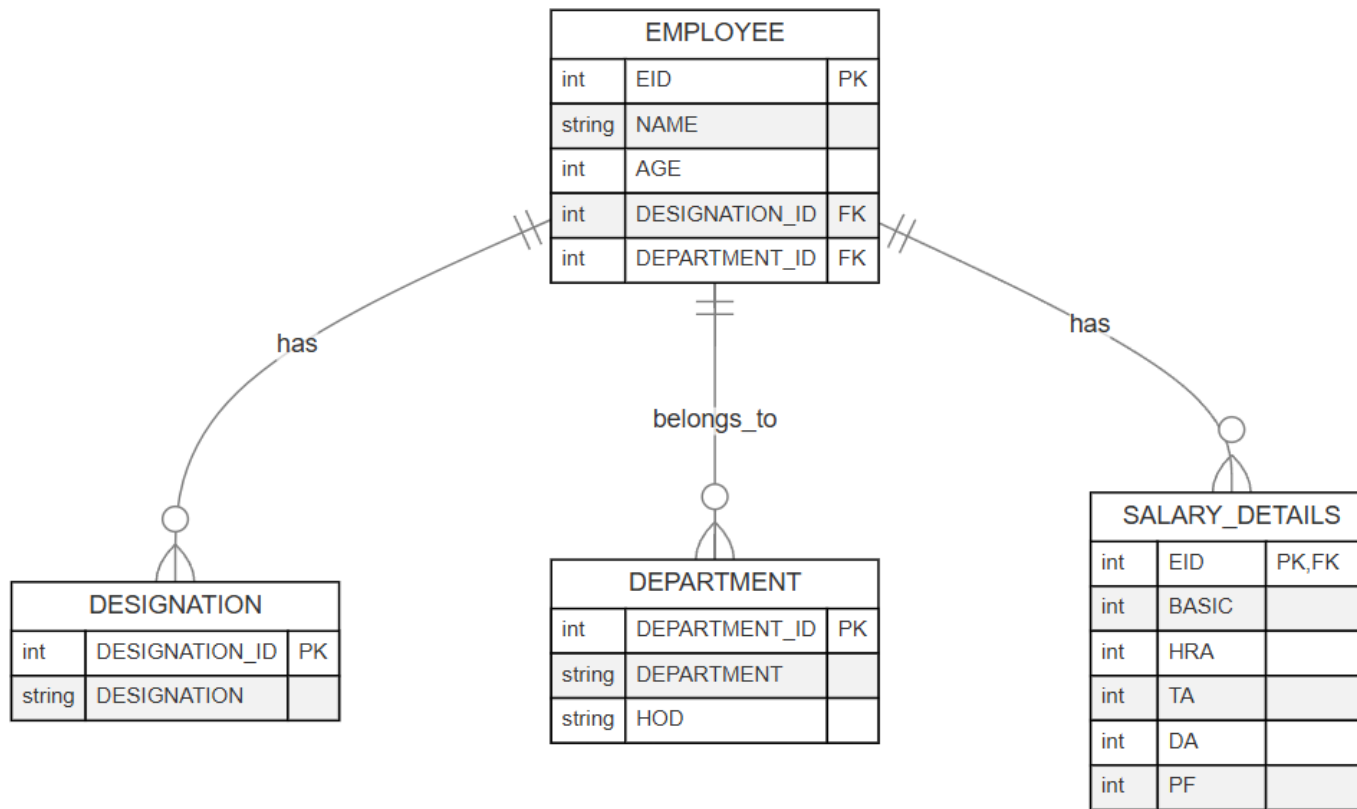
# STEP 5: CONVERT TO BCNF (BOYCE-CODD NORMAL FORM)

## ✓ Rules for BCNF:

- Table must be in 3NF.
- Every determinant must be a candidate key.

**The tables are already in BCNF, as all determinants are candidate key.**

# ER DIAGRAM



**THANKS!!**