

Employee Portal - DB Scheme Normalize Form

Step 1 Unnormalized Form (UNF)

Attribute Name	Sample Values	Notes (Repeating / Multivalued)
Employee ID	E001	No
Name	Alice	No
Email	alice@gmail.com	No
Department	HR	No
Hire Date	20/12/2020	Yes - Repeating
Office Location	HQ	Yes - Repeating
City	Kota Kinabalu	Yes - Repeating
Projects	Projects A [2021.8.13 - 2021.11.24], Projects B [2022.4.11 - 2022.9.7]	Yes - Multivalued

Step 2 : Unnormalized Form (1NF)

- No repeating groups/lists.
- Rule: Make sure each column only has one row and no duplicates.

Employee	Name	Email	Department	Hire Date	Office Location	City	Project s Name	Project Start	Project s End
E001	Alice	alice@gmail.com	HR	20/12/2020	HQ	Kota Kinabalu	Project s A	2021.8.13	2021.11.24
E001	Alice	alice@gmail.com	HR	20/12/2020	HQ	Kota Kinabalu	Project s B	2022.4.11	2022.9.7

Step 3: Second Normal Form (2NF)

Employee Table

Employee ID	Name	Email	Department	Hire Date	Office	City
E001	Alice	alice@gmail.com	HR	20/12/2020	HQ	Kota Kinabalu
E002	Bob	bob12@gmail.com	Finance	10/2/2020	Twu Branch	Tawau

Projects Table

Project ID	Project Name	Start Date	End Date
P1	Project A	2021.8.13	2021.11.24
P2	Project B	2022.4.11	2022.9.7
P3	Project C	2022.6.21	2022.9.19

Project Assignment Table (join table)

Assignment ID	Employee ID	Project ID	Assignment Date
A1	E001	P1	2021.8.13
A2	E001	P2	2022.4.11

Step 4: Third Normal Form (3NF)

Department Table

Department ID	Department Name	Location ID
D1	HR	L1
D2	Finance	L2

Location Table

Location ID	Office	City
L1	HQ	Kota Kinabalu
L2	Twu Branch	Tawau

Summary Table

Table Name	Primary Key	Foreign Keys
Employee	Employee ID	Department > Department ID
Department	Department ID	Location > Location ID
Location	Location ID	-
Projects	Project ID	-
Project Assignment	Assignment ID	Project > Project ID Employee > Employee ID

Database Relationship Summary

Relationship Type	Involved Entities	Description
One-to-Many	Locations → Departments	One location can host multiple departments
One-to-Many	Departments → Employees	One department can have multiple employees
Many-to-One (alt view)	Employees → Departments	Each employee belongs to one department
Many-to-One (alt view)	Departments → Locations	Each department is located in one office location
One-to-Many	Projects → ProjectAssignments	One project can have multiple employee assignments
One-to-Many	Employees → ProjectAssignments	One employee can have multiple project assignments
Many-to-Many	Employees - Projects	Employees can be assigned to multiple projects, and projects can have many employees
One-to-Many	ProjectAssignments → Projects	Each project assignment is for a single project
One-to-Many	ProjectAssignments → Employees	Each project assignment is for a single employee