

DBMS ASSIGNMENT

1. Employees Table

EmployeeID	EmployeeName	Department	ManagerID	Salary	HireDate
1	John Smith	HR	101	50000	2022-01-15
2	Alice Brown	IT	102	60000	2022-02-20
3	Mark Johnson	Sales	101	55000	2022-03-10

First Normal Form (1NF)

table is already in 1NF since it has a unique identifier (EmployeeID) for each row.

Second Normal Form (2NF)

The table is in 2NF because there are no partial dependencies.

Third Normal Form (3NF)

The table is in 3NF because there are no transitive dependencies.

Making it more efficient:

Departments Table

DepartmentID	DepartmentName
1	HR
2	IT
3	Sales

Managers Table

ManagerID	ManagerName
101	Smith
102	Brown

Employees Table

EmployeeID	EmployeeName	Salary	HireDate
1	John Smith	50000	2022-01-15
2	Alice Brown	60000	2022-02-20
3	Mark Johnson	55000	2022-03-10

DepartmentEmployeeMapping Table

EmployeeID	DepartmentID	ManagerID
1	1	101
2	2	102
3	3	101

2.

ProgramID	ProgramName	Trainer	Department	EmployeeID	EmployeeName	Date
1	Java Fundamentals	John Smith	IT	101	Alice Brown	2022-03-10
2	Project Management	Sarah White	HR	102	Bob Green	2022-03-01
3	Sales Techniques	Mark Johnson	Sales	103	Charlie Black	2022-03-20

First Normal Form (1NF)

table is already in 1NF

Second Normal Form (2NF)

ProgramID -> ProgramName, Trainer

EmployeeID -> EmployeeName

ProgramID -> Department

Removing partial dependency

Program Table

ProgramID	ProgramName	Trainer
1	Java Fundamentals	John Smith
2	Project Management	Sarah White
3	Sales Techniques	Mark Johnson

Employee Table

EmployeeID	EmployeeName
101	Alice Brown
102	Bob Green
103	Charlie Black

Department Table

DepartmentID	Department
D1	IT
D2	HR
D3	Sales

ProgramEmployeeMapping Table

ProgramID	DepartmentID	EmployeeID	Date
1	D1	101	2022-03-01

Third Normal Form (3NF)

table is already in 3NF.since there is no transitive dependency after 2NF.

3. Customer orders

OrderID	CustomerName	ProductID	ProductName	Qty	UnitPrice	TotalAmount	OrderDate
1	John Doe	101	Laptop	2	800	1600	2022-01-15
2	Jane Smith	102	Smartphone	1	500	500	2022-02-20
3	John Doe	103	Printer	1	200	200	2022-03-10

First Normal Form (1NF)

table is already in 1NF since it has a unique identifier (EmployeeID) for each row.

Second Normal Form (2NF)

ProductID -> productName,UnitPrice.

To eliminate partial dependencies, we can create a new table for the dependent attributes:

Order table

OrderID	CustomerName	TotalAmount	OrderDate
1	John Doe	1600	2022-01-15
2	Jane Smith	500	2022-02-20
3	John Doe	200	2022-03-10

Products Table

ProductID	ProductName	UnitPrice
101	Laptop	800
102	Smartphone	500
103	Printer	200

OrderProductMapping Table

OrderID	ProductID	Qty
1	101	2
2	102	1
3	103	1

Third Normal Form (3NF)

The table is in 3NF because there are no transitive dependencies.

4.

EmployeeID	FirstName	LastName	StressLevel	HoursOfWork	BreaksTaken	PhysicalActivity	CounselingSessions
101	Sarah	White	Moderate	45	3	Yoga	2
102	Bob	Green	High	50	2	Jogging	1
103	Charlie	Black	Low	40	4	Meditation	3
104	David	Miller	High	48	1	Gym	2
105	Jane	Doe	Moderate	42	3	Walking	1

First Normal Form (1NF)

table is already in 1NF since it has a unique identifier (EmployeeID) for each row.

Second Normal Form (2NF)

table is already in 2NF since there is no partial dependency.

Third Normal Form (3NF)

The table is in 3NF because there are no transitive dependencies.

Making it more efficient.

Employees Table:

EmployeeID	FirstName	LastName
101	Sarah	White
102	Bob	Green
103	Charlie	Black
104	David	Miller
105	Jane	Doe

Activities Table:

ActivityID	PhysicalActivity
1	Yoga
2	Jogging
3	Meditation
4	Gym
5	Walking

EmployeeWellnessDetails Table:

EmployeeID	StressLevel	HoursOfWork	BreaksTaken	ActivityID	CounselingSessions
101	Moderate	45	3	1	2
102	High	50	2	2	1
103	Low	40	4	3	3
104	High	48	1	4	2

105	Moderate	42	3	5	1
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5.

ItemID	SellerName	ItemName	Category	Price	Quantity	Description	Condition	Location	DateListed
101	John's Treasures	Vintage Chair	Furniture	50.00	2	Beautiful vintage chair, excellent condition	Like New	Booth 15, Section A	2022-01-15
102	Alice's Finds	Antique Clock	Home Decor	80.00	1	Authentic antique clock with Roman numerals	Good	Stall 8, Section B	2022-02-20
103	Mark's Collectibles	Vinyl Records	Music	15.00	10	Various artists and genres, in good condition	Used	Booth 20, Section C	2022-03-10
104	Emma's Treasures	Vintage Jewelry	Accessories	35.00	5	Assorted vintage jewelry pieces, unique designs	Excellent	Stall 12, Section D	2022-04-05
105	Robert's Finds	Retro Camera	Electronics	60.00	1	Vintage Polaroid camera with original case	Good	Booth 5, Section A	2022-05-15

First Normal Form (1NF)

table is already in 1NF since it has a unique identifier (EmployeeID) for each row.

Second Normal Form (2NF)

table is already in 2NF since there are no partial dependencies in this table, as ItemID is a whole key.

Third Normal Form (3NF)

After removing transitive dependency

Categories Table:

CategoryID	CategoryName
1	Furniture
2	Home Decor
3	Music
4	Accessories

5	Electronics
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Items Table:

ItemID	ItemName	CategoryID	Price	Description	Condition
101	Vintage Chair	1	50.00	Beautiful vintage chair, excellent condition	Like New
102	Antique Clock	2	80.00	Authentic antique clock with Roman numerals	Good
103	Vinyl Records	3	15.00	Various artists and genres, in good condition	Used
104	Vintage Jewelry	4	35.00	Assorted vintage jewelry pieces, unique designs	Excellent
105	Retro Camera	5	60.00	Vintage Polaroid camera with original case	Good

Sellers Table:

SellerID	SellerName
101	John's Treasures
102	Alice's Finds
103	Mark's Collectibles
104	Emma's Treasures
105	Robert's Finds

Listings Table:

SellerID	ItemID	DateListed	LocationID
101	101	2022-01-15	1
102	102	2022-02-20	2
103	103	2022-03-10	3
104	104	2022-04-05	4
105	105	2022-05-15	5

6.

CID	CourseName	Instructor	Department	Credits	Enrolled Students	StartDate	EndDate	Location	Availability
101	Introduction to Biology	Prof. Smith	Science	3	25	2022-01-15	2022-05-10	Room 101	Open
102	Programming in Python	Prof. Brown	Computer Science	4	30	2022-02-20	2022-06-15	Lab 3, Building B	Closed
103	Financial Accounting	Prof. Green	Finance	3	20	2022-03-10	2022-07-05	Room 201	Open

104	English Literature	Prof. White	Humanities	3	22	2022-04-05	2022-08-20	Room 301	Open
105	Web Development Fundamentals	Prof. Black	IT	4	28	2022-05-15	2022-09-25	Lab 2, Building A	Closed

First Normal Form (1NF)

table is already in 1NF since it has a unique identifier (EmployeeID) for each row.

Second Normal Form (2NF)

table is already in 2NF since there is no partial dependency.

Third Normal Form (3NF)

Instructor-> Department

Instructor Table

InstructorID	Instructor	Department
1	Prof. Smith	Science
2	Prof. Brown	Computer Science
3	Prof. Green	Finance
4	Prof. White	Humanities
5	Prof. Black	IT

Courses Table

CID	CourseName	Credits
101	Introduction to Biology	3
102	Programming in Python	4

103	Financial Accounting	3
104	English Literature	3
105	Web Development Fundamentals	4

CourseDates Table

CID	InstructorID	StartDate	EndDate	Location	Availability
101	1	2022-01-15	2022-05-10	Room 101	Open
102	2	2022-02-20	2022-06-15	Lab 3, Building B	Closed
103	3	2022-03-10	2022-07-05	Room 201	Open
104	4	2022-04-05	2022-08-20	Room 301	Open
105	5	2022-05-15	2022-09-25	Lab 2, Building A	Closed

Enrollment Table:

CID	EnrolledStudents
101	25
102	30
103	20
104	22
105	28