1. Employee Information

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

1 NF

The table is already in 1 NF as all attributes are atomic.

2 NF

Table has only one primary key (EmployeeID). It does not have a composite key. So, the table is already in 2 NF. So, there is no partial dependency.

3 NF

The table is also in 3 NF as there is no transitive dependency.

Optimized Tables

Employee 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

Department Table

DepartmentID	Department
01	HR
02	Sales
03	IT

Manager Table

ManagerID	ManagerName
101	Carl

102	Mathew

Employee-Department-Manager Table

DepartmentID	Manager ID	EmployeeID
01	101	1
02	101	2
03	102	3

2. Training Programs

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

1NF

The table is already in 1 NF as all attributes are atomic.

2NF

Table is not in 2 NF. Because it has composite primary key, ProgramID and EmployeeID. So, there is partial dependency.

Program Table

ProgramID	ProgramName	Trainer	Date
1	Java Fundamentals	John Smith	2022-03-01
2	Project Management	Sarah White	2022-03-10
3	Sales Techniques	Mark Johnson	2022-03-20

Department Table

DepartmentID	Department
01	IT
02	HR
03	Sales

Employee Table

EmployeeID	EmployeeName
101	Alice Brown
102	Bob Green
103	Charlie Black

Mapping Table

EmployeeID	DepartmentID	ProgramID
101	01	1
102	02	2
103	03	3

3NF

Table is already in 3 NF, as there is no transitive dependency.

3. Customer orders

Order ID	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

1 NF

The table is already in 1 NF as all attributes are atomic.

2 NF

Table is not in 2 NF. Because it has composite primary key, OrderID and ProductID. So, there is partial dependency.

Product Table

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

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

Mapping Table

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

3 NF

Table is already in 3 NF as there is no transitive dependency

4. Stress management

Employee ID	FirstName	LastName	StressLevel	HoursOf Work	Breaks Taken	PhysicalActivity	Counseling Sessions
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

1 NF

Table is already in 1 NF as there is only atomic values

2 NF

Table is already in 2 NF as there is no partial dependency (No composite keys, only one primary key (EmployeeID))

3 NF

Table is not in 3 NF as there is transitive dependency between physical activity and stress level (non-prime to non-prime relation)

Employee Table

EmployeeID	FirstName	LastName	HoursOfWork	BreaksTaken	CounselingSessions
101	Sarah	White	45	3	2
102	Bob	Green	50	2	1
103	Charlie	Black	40	4	3
104	David	Miller	48	1	2
105	Jane	Doe	42	3	1

Stress Table

StressID	StressLevel
S01	Moderate
S02	High
S03	Low

Activity Table

ActivityID	PhysicalActivity
A01	Yoga
A02	Jogging
A03	Meditation
A04	Gym
A05	Walking

Mapping Table

EmployeeID	ActivityID	StressID
101	A01	S01
102	A02	S02
103	A03	S03
104	A04	S02
105	A05	S01

5. Flee Market

Item ID	Seller Name	Item Name	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

<u>1 NF</u>

Table is already in 1 NF as there are only atomic values

<u>2 NF</u>

The table is already in 2 NF as there is no partial dependencies. ItemID is the only primary key, no composite keys.

3 NF

The table is not in 3 NF as there is transitive dependency between SellerName and Location

Item Table

ItemID	ItemName	Category	Price	Quantity	Description	Condition	DateListed
101	Vintage Chair	Furniture	50.00	2	Beautiful vintage chair, excellent condition	Like New	2022-01-15
102	Antique Clock	Home Decor	80.00	1	Authentic antique clock with Roman numerals	Good	2022-02-20
103	Vinyl Records	Music	15.00	10	Various artists and genres, in good condition	Used	2022-03-10
104	Vintage Jewelry	Accessories	35.00	5	Assorted vintage jewelry pieces, unique designs	Excellent	2022-04-05
105	Retro Camera	Electronics	60.00	1	Vintage Polaroid camera with original case	Good	2022-05-15

Seller Table

SellerID	SellerName	Location
01	John's Treasures	Booth 15, Section A
02	Alice's Finds	Stall 8, Section B
03	Mark's Collectibles	Booth 20, Section C
04	Emma's Treasures	Stall 12, Section D
05	Robert's Finds	Booth 5, Section A

Mapping Table

SellerID	ItemID	DateListed
01	101	2022-01-15
02	102	2022-02-20
03	103	2022-03-10
04	104	2022-04-05
05	105	2022-05-15

6. Learning Management System

CID	Course Name	Instructor	Department	Credits	Enrolled Students	Start Date	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

<u>1 NF</u>

The table is already in 1 NF as it has atomic values.

<u>2 NF</u>

The table is already in 2 NF as it does not have partial dependency and composite key.

<u>3 NF</u>

The table is not in 3 NF as it has transitive dependency.

Course 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

Department Table

DepartmentID	Department
01	Science
02	Computer Science
03	Finance
04	Humanities
05	IT

Course Details Table

CID	Enrolled Students	StartDate	EndDate	Location	Availability
101	25	2022-01-15	2022-05-10	Room 101	Open
102	30	2022-02-20	2022-06-15	Lab 3, Building B	Closed
103	20	2022-03-10	2022-07-05	Room 201	Open
104	22	2022-04-05	2022-08-20	Room 301	Open
105	28	2022-05-15	2022-09-25	Lab 2, Building A	Closed

Instructor Table

InstructorID	Instructor
01	Prof. Smith
02	Prof. Brown
03	Prof. Green
04	Prof. White

05	Prof. Black

Mapping Table

CID	DepartmentID	InstructorID
101	01	01
102	02	02
103	03	03
104	04	04
105	05	05