

DBMS Normalization Assignment

- Abraham Jacob Kurialanickal

2023-24 Batch 1

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

- The table is already 1NF.
- Removing partial dependencies to convert to 2NF.

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

- Removing transitive dependencies to convert to 3NF.

EmployeeID	EmployeeName	Department Id	Salary	HireDate
1	John Smith	D01	50000	2022-01-15
2	Alice Brown	D02	60000	2022-02-20
3	Mark Johnson	D03	55000	2022-03-10
Department Id	Department			
D01	HR			
D02	IT			
D03	Sales			
Department Id	ManagerID			
D01	101			
D02	102			
D03	101			

- **NORMALIZED TABLES**

Employee_information

EmployeeID	EmployeeName	Department Id	Salary	HireDate
1	John Smith	D01	50000	2022-01-15
2	Alice Brown	D02	60000	2022-02-20
3	Mark Johnson	D03	55000	2022-03-10

Department_information

Department Id	Department
D01	HR
D02	IT
D03	Sales

Department_Manager_mapping

Department Id	ManagerID
D01	101
D02	102
D03	101

2. Training Programs

Program ID	ProgramName	Trainer	Department	Employee ID	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

- The table is already 1NF.
- Removing partial dependencies to convert to 2NF.

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

ProgramID	Department	EmployeeID	EmployeeName	Date
1	IT	101	Alice Brown	2022-03-01
2	HR	102	Bob Green	2022-03-10
3	Sales	103	Charlie Black	2022-03-20

- Removing transitive dependencies to convert to 3NF.

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

ProgramID	EmployeeID	Date
1	101	2022-03-01
2	102	2022-03-10
3	103	2022-03-20

EmployeeID	EmployeeName	Department Id
101	Alice Brown	D01
102	Bob Green	D02
103	Charlie Black	D03

Department Id	Department
D01	IT
D02	HR
D03	Sales

- **NORMALIZED TABLES**

Training_programs

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

Program_Employee_mapping

ProgramID	EmployeeID	Date
1	101	2022-03-01
2	102	2022-03-10
3	103	2022-03-20

Employee_information

EmployeeID	EmployeeName	Department Id
101	Alice Brown	D01
102	Bob Green	D02
103	Charlie Black	D03

Department_information

Department Id	Department
D01	IT
D02	HR
D03	Sales

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

- The table is already 1NF.
- Removing partial dependencies to convert to 2NF.

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

- Removing transitive dependencies to convert to 3NF.

OrderID	CustomerId					
1	C01					
2	C02					
3	C03					
CustomerId		CustomerName				
C01		John Doe				
C02		Jane Smith				
C03		John Doe				
OrderID	Qty	TotalAmount	OrderDate			
1	2	1600	2022-01-15			
2	1	500	2022-02-20			
3	1	200	2022-03-10			
ProductID	ProductName	UnitPrice				
101	Laptop	800				
102	Smartphone	500				
103	Printer	200				

- **NORMALIZED TABLES**

Customer_Order_mapping

OrderID	CustomerId
1	C01
2	C02
3	C03

Customer_details

CustomerId	CustomerName
C01	John Doe
C02	Jane Smith
C03	John Doe

Order_details

OrderID	ProductID	Qty	TotalAmount	OrderDate
1	101	2	1600	2022-01-15
2	102	1	500	2022-02-20
3	103	1	200	2022-03-10

Product_details

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

4. Stress management

Employee ID	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

- The table is already 1NF.
- Removing partial dependencies to convert to 2NF.

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

- The table is already 3NF.

- **NORMALIZED TABLES**

Employee_information

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

Employee_stressinformation

EmployeeID	StressLevel	HoursOfWork	BreaksTaken	PhysicalActivity	CounselingSessions
101	Moderate	45	3	Yoga	2
102	High	50	2	Jogging	1
103	Low	40	4	Meditation	3
104	High	48	1	Gym	2
105	Moderate	42	3	Walking	1

5. Flee Market

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

- Convert to 1NF by splitting non-atomic values

ItemID	SellerName	ItemName	Category	Price	Quantity	Description	Condition	Location	Section	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	Used	Booth 20	Section C	2022-03-10

						good condition				
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

- Removing partial dependencies to convert to 2NF.

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
ItemID	SellerName		Location		Section		
101	John's Treasures		Booth 15		Section A		
102	Alice's Finds		Stall 8		Section B		
103	Mark's Collectibles		Booth 20		Section C		
104	Emma's Treasures		Stall 12		Section D		
105	Robert's Finds		Booth 5		Section A		

- Removing transitive dependencies to convert to 3NF.

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
ItemID	SellerID						
101	S01						
102	S02						
103	S03						
104	S04						
105	S05						
SellerID	SellerName		Location		Section		
S01	John's Treasures		Booth 15		Section A		
S02	Alice's Finds		Stall 8		Section B		
S03	Mark's Collectibles		Booth 20		Section C		
S04	Emma's Treasures		Stall 12		Section D		
S05	Robert's Finds		Booth 5		Section A		

- **NORMALIZED TABLES**

Item_information

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

Item_Seller_mapping

ItemID	SellerId
101	S01
102	S02
103	S03
104	S04
105	S05

Seller_information

SellerId	SellerName	Location	Section
S01	John's Treasures	Booth 15	Section A
S02	Alice's Finds	Stall 8	Section B
S03	Mark's Collectibles	Booth 20	Section C
S04	Emma's Treasures	Stall 12	Section D
S05	Robert's Finds	Booth 5	Section A

6. Learning Management System

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

- Convert to 1NF by splitting non-atomic values

CID	CourseName	Instructor	Department	Credits	Enrolled Students	StartDate	EndDate	Room	Building	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

- Removing partial dependencies to convert to 2NF.

CID	CourseName	Credits	Enrolled Students	StartDate	EndDate
101	Introduction to Biology	3	25	2022-01-15	2022-05-10
102	Programming in Python	4	30	2022-02-20	2022-06-15
103	Financial Accounting	3	20	2022-03-10	2022-07-05
104	English Literature	3	22	2022-04-05	2022-08-20
105	Web Development Fundamentals	4	28	2022-05-15	2022-09-25

CID	Instructor	Department
101	Prof. Smith	Science
102	Prof. Brown	Computer Science
103	Prof. Green	Finance
104	Prof. White	Humanities
105	Prof. Black	IT

CID	Room	Building	Availability
101	Room 101		Open
102	Lab 3	Building B	Closed
103	Room 201		Open
104	Room 301		Open
105	Lab 2	Building A	Closed

- Removing transitive dependencies to convert to 3NF.

CID	CourseName	Credits	Enrolled Students	StartDate	EndDate
101	Introduction to Biology	3	25	2022-01-15	2022-05-10
102	Programming in Python	4	30	2022-02-20	2022-06-15
103	Financial Accounting	3	20	2022-03-10	2022-07-05
104	English Literature	3	22	2022-04-05	2022-08-20
105	Web Development Fundamentals	4	28	2022-05-15	2022-09-25

CID	InstructorId
101	P01
102	P02
103	P03
104	P04
105	P05

InstructorId	Instructor	Department
P01	Prof. Smith	Science
P02	Prof. Brown	Computer Science
P03	Prof. Green	Finance
P04	Prof. White	Humanities
P05	Prof. Black	IT

CID	RoomID
101	R01
102	R02
103	R03
104	R04
105	R05

RoomID	Room	Building	Availability
R01	Room 101		Open
R02	Lab 3	Building B	Closed
R03	Room 201		Open
R04	Room 301		Open
R05	Lab 2	Building A	Closed

- **NORMALIZED TABLES**

Course_information

CID	CourseName	Credits	Enrolled Students	StartDate	EndDate
101	Introduction to Biology	3	25	2022-01-15	2022-05-10
102	Programming in Python	4	30	2022-02-20	2022-06-15
103	Financial Accounting	3	20	2022-03-10	2022-07-05
104	English Literature	3	22	2022-04-05	2022-08-20
105	Web Development Fundamentals	4	28	2022-05-15	2022-09-25

Course_Instructor_mapping

CID	InstructorId
101	P01
102	P02
103	P03
104	P04
105	P05

Instructor_information

InstructorId	Instructor	Department
P01	Prof. Smith	Science
P02	Prof. Brown	Computer Science
P03	Prof. Green	Finance
P04	Prof. White	Humanities
P05	Prof. Black	IT

Course_Room_mapping

CID	RoomID
101	R01
102	R02
103	R03
104	R04
105	R05

Room_information

RoomID	Room	Building	Availability
R01	Room 101		Open
R02	Lab 3	Building B	Closed
R03	Room 201		Open
R04	Room 301		Open

R05	Lab 2	Building A	Closed
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