DBMS TASK 1

Dencymol Baby

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 |

There are no multi-valued cells in the table. So, this table is in 1nf.

**Removing Partial dependencies**

EmployeeName, Salary and HireDate are depends on the EmployeeID.

| 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 |

In this table the primary key is "**EmployeeID**"

| EmployeeID | Department | ManagerID |
|---|---|---|
| 1 | HR | 101 |
| 2 | IT | 102 |
| 3 | Sales | 101 |

**Making it more efficient**

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 |
|---|---|
| 101 | HR |
| 102 | IT |
| 103 | Sales |

Mapping Table

| EmployeeID | DepartmentID | ManagerID |
|---|---|---|
| 1 | 101 | 101 |
| 2 | 102 | 102 |
| 3 | 103 | 101 |

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2. Training Programs

| ProgramID | 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 |

There are no multi-valued cells in the table. So, this table is in 1nf.

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 |
| 2 | D2 | 102 | 2022-03-10 |
| 3 | D3 | 103 | 2022-03-20 |

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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 |

There are no multi-valued cells in the table. So, this table is in 1nf.

**Removing partial dependency:**

CustomerName, Qty, TotalAmount, OrderDate are depends on OrderId

| OrderID | CustomerName | Qty | TotalAmount | OrderDate |
|---|---|---|---|---|
| 1 | John Doe | 2 | 1600 | 2022-01-15 |

| 2 | Jane Smith | 1 | 500 | 2022-02-20 |
| 3 | John Doe | 1 | 200 | 2022-03-10 |

ProductName and UnitPrice depends on ProductID

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

## **Removing transitive dependency:**

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

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

| CustomerID | CustomerName |
| --- | --- |
| 101 | John Doe |
| 102 | Jane Smith |

Thus, the normalized table is:

Order Information

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

Customer Information

| CustomerID | CustomerName |
|---|---|
| 101 | John Doe |
| 102 | Jane Smith |

Product information

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

Order-Product Mapping

| OrderID | ProductID |
|---|---|
| 1 | 101 |
| 2 | 102 |
| 3 | 103 |

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4. Stress management

| 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 |

There are no multi-valued cells in the table. So, this table is in 1nf.

## Removing partial dependency:

| 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 |

Thus, the normalized table is:

Stress Level Information

| StressLevelID | StressLevel |
|---|---|
| 101 | Moderate |
| 102 | High |
| 103 | Low |

Physical Activity information

| PhysicalActivityID | PhysicalActivity |
|---|---|
| 101 | Yoga |
| 102 | Jogging |
| 103 | Meditation |
| 104 | Gym |

| 105 | | |
| --- | --- | --- |
| | Walking | |

Employee Information

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

Mapping Table

| EmployeeID | StressLevelID | HoursOfWork | BreaksTaken | PhysicalActivity | CounselingSessions |
| --- | --- | --- | --- | --- | --- |
| 101 | 101 | 45 | 3 | 101 | 2 |
| 102 | 102 | 50 | 2 | 102 | 1 |
| 103 | 103 | 40 | 4 | 103 | 3 |
| 104 | 102 | 48 | 1 | 104 | 2 |
| 105 | 101 | 42 | 3 | 105 | 1 |

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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 | 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 |

There are no multi-valued cells in the table. So, this table is in 1nf.

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Item Information

| ItemID | ItemName | CategoryId | Price | Description | Condition |
|---|---|---|---|---|---|
| 101 | Vintage Chair | C1 | 50.00 | Beautiful vintage chair, excellent condition | Like New |
| 102 | Antique Clock | C2 | 80.00 | Authentic antique clock with Roman numerals | Good |
| 103 | Vinyl Records | C3 | 15.00 | Various artists and genres, in good condition | Used |
| 104 | Vintage Jewelry | C4 | 35.00 | Assorted vintage jewelry pieces, unique designs | Excellent |
| 105 | Retro Camera | C5 | 60.00 | Vintage Polaroid camera with original case | Good |

Category Information

| Category Id | Category |
|---|---|

| | |
|---|---|
| C1 | Furniture |
| C2 | Home Decor |
| C3 | Music |
| C4 | Accessories |
| C5 | Electronics |

Seller Information

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

Item-Seller Mapping

| ItemID | SellerID | Quantity | Location | DateListed |
|---|---|---|---|---|
| 101 | 101 | 2 | Booth 15, Section A | 2022-01-15 |
| 102 | 102 | 1 | Stall 8, Section B | 2022-02-20 |
| 103 | 103 | 10 | Booth 20, Section C | 2022-03-10 |
| 104 | 104 | 5 | Stall 12, Section D | 2022-04-05 |
| 105 | 105 | 1 | Booth 5, Section A | 2022-05-15 |

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6.  Learning Management System

| CID | CourseName | 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 |

There are no multi-valued cells in the table. So, this table is in 1nf.

Course Details Table

| CID | CourseName | Credits | StartDate | EndDate | DeaprtmentID |
|-----|-----------|---------|-----------|---------|-------------|
| 101 | Introduction to Biology | 3 | 2022-01-15 | 2022-05-10 | D1 |
| 102 | Programming in Python | 4 | 2022-02-20 | 2022-06-15 | D2 |
| 103 | Financial Accounting | 3 | 2022-03-10 | 2022-07-05 | D3 |
| 104 | English Literature | 3 | 2022-04-05 | 2022-08-20 | D4 |
| 105 | Web Development Fundamentals | 4 | 2022-05-15 | 2022-09-25 | D5 |

Department Table

| DeaprtmentID | DepartmentName |
|-------------|----------------|

| D1 | Science |
|----|---------|
| D2 | Computer Science |
| D3 | Finance |
| D4 | Humanities |
| D5 | IT |

Instructor Table

| InstructorID | Instructor | DeaprtmentID |
|--------------|------------|--------------|
| I1 | Prof. Smith | D1 |
| I2 | Prof. Brown | D2 |
| I3 | Prof. Green | D3 |
| I4 | Prof. White | D4 |
| I5 | Prof. Black | D5 |

CouseSchedule Table

| CID | InstructorID | EnrolledStudents | Location | Availability |
|-----|--------------|------------------|----------|--------------|
| 101 | I1 | 25 | Room 101 | Open |
| 102 | I2 | 30 | Lab 3, Building B | Closed |
| 103 | I3 | 20 | Room 201 | Open |
| 104 | I4 | 22 | Room 301 | Open |
| 105 | I5 | 28 | Lab 2, Building A | Closed |