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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1. 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 |

--------------------------------------------------------------------------------------------------------------------

1. 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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1. 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 |

--------------------------------------------------------------------------------------------------------------------

1. 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 |

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

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

|  |  |
| --- | --- |
| **CategoryId** | **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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1. 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 |

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 |