**DBMS Normalization Assignment**

1. Employee Information

**1NF** (each column has atomic values)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 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 |

**2NF** (remove partial dependency)

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 | IT |
| 03 | Sales |

Employee department Mapping

|  |  |  |
| --- | --- | --- |
| EmployeeID | DepartmentID | ManagerID |
| 1 | 01 | 101 |
| 2 | 02 | 102 |
| 3 | 03 | 101 |

Manager Table

|  |  |
| --- | --- |
| ManagerID | ManagerName |
| 101 | Simon |
| 102 | Anil |

2. Training Programs

**1NF**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 |

**2NF**

Program table

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

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

**3NF**

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

|  |  |
| --- | --- |
| EmployeeID | EmployeeName |
| 101 | Alice Brown |
| 102 | Bob Green |
| 103 | Charlie Black |

|  |  |  |  |
| --- | --- | --- | --- |
| ProgramID | EmployeeID | Department | Date |
| 1 | 101 | IT | 2022-03-01 |
| 2 | 102 | HR | 2022-03-10 |
| 3 | 103 | Sales | 2022-03-20 |

3. Customer Orders

**1NF**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |

**2NF**

|  |  |
| --- | --- |
| OrderID | CustomerName |
| 1 | John Doe |
| 2 | Jane Smith |
| 3 | John Doe |

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

**3NF**

|  |  |
| --- | --- |
| CustomerID | CustomerName |
| 1 | John Doe |
| 2 | Jane Smith |

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

|  |  |  |  |
| --- | --- | --- | --- |
| 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 |

4. Stress management

**1NF**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |

**2NF**

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

|  |  |  |  |
| --- | --- | --- | --- |
| EmployeeID | StressLevel | PhysicalActivity | CounselingSessions |
| 101 | Moderate | Yoga | 2 |
| 102 | High | Jogging | 1 |
| 103 | Low | Meditation | 3 |
| 104 | High | Gym | 2 |
| 105 | Moderate | Walking | 1 |

5. Flee Market

**1NF**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |

**2NF**

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

|  |  |  |
| --- | --- | --- |
| SellerID | SellerName | Location |
| 1 | John's Treasures | Booth 15, Section A |
| 2 | Alice's Finds | Stall 8, Section B |
| 3 | Mark's Collectibles | Booth 20, Section C |
| 4 | Emma's Treasures | Stall 12, Section D |
| 5 | Robert's Finds | Booth 5, Section A |

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

6. Learning Management System

**1NF**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |

**2NF**

|  |  |  |  |
| --- | --- | --- | --- |
| CID | CourseName | Credits | Department |
| 101 | Introduction to Biology | 3 | Science |
| 102 | Programming in Python | 4 | Computer Science |
| 103 | Financial Accounting | 3 | Finance |
| 104 | English Literature | 3 | Humanities |
| 105 | Web Development Fundamentals | 4 | IT |

|  |  |
| --- | --- |
| InstructorID | Instructor |
| 1 | Prof. Smith |
| 2 | Prof. Brown |
| 3 | Prof. Green |
| 4 | Prof. White |
| 5 | Prof. Black |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | InstructorID | Enrolled  Students | StartDate | EndDate | Location | Availability |
| 101 | 1 | 25 | 2022-01-15 | 2022-05-10 | Room 101 | Open |
| 102 | 2 | 30 | 2022-02-20 | 2022-06-15 | Lab 3, Building B | Closed |
| 103 | 3 | 20 | 2022-03-10 | 2022-07-05 | Room 201 | Open |
| 104 | 4 | 22 | 2022-04-05 | 2022-08-20 | Room 301 | Open |
| 105 | 5 | 28 | 2022-05-15 | 2022-09-25 | Lab 2, Building A | Closed |