**DBMS NORMALIZATION ASSIGNMENT**

QUESTION NO: 1 **–** Employee Information

**1NF (First Normal Form)**: No repeating groups.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 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 (Second Normal Form)**: Removing partial dependencies.

Table: Employee

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

Table: Department

|  |  |
| --- | --- |
| DepartmentID | Department |
| 01 | HR |
| 02 | IT |
| 03 | Sales |

Table: Manager

|  |  |
| --- | --- |
| ManagerID | ManagerName |
| 101 | Charlie Black |
| 102 | Sarah White |

Table: Manager Department Mapping

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

**3NF (Third Normal Form)**: No transitive dependencies.

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**1NF (First Normal Form)**: No repeating groups.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 (Second Normal Form)**: Removing partial dependencies.

Table: Program

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

Table: Program Employee

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

**3NF (Third Normal Form)**: Removing transitive dependencies.

Table: Program

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

Table: Employee

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

Table: Program Employee Mapping

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

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QUESTION NO: 3 **–** Customer Orders

**1NF (First Normal Form)**: No repeating groups.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 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 (Second Normal Form)**: Removing partial dependencies.

Table: Order Customer

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

Table: Order Product

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 (Third Normal Form)**: Removing transitive dependencies.

Table: Order

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

Table: Product

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

Table: Customer

|  |  |
| --- | --- |
| CustomerID | CustomerName |
| 01 | John Doe |
| 02 | Jane Smith |
| 03 | John Doe |

Table: Customer Product Mapping

|  |  |  |
| --- | --- | --- |
| OrderID | CustomerID | ProductID |
| 1 | 01 | 101 |
| 2 | 02 | 102 |
| 3 | 03 | 103 |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*QUESTION NO: 4 **–** Stress Management

**1NF (First Normal Form)**: No repeating groups.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 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 (Second Normal Form)**: Removing partial dependencies.

Table: Employee

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

Table: Stress

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

**3NF (Third Normal Form)**: No transitive dependencies.

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QUESTION NO: 5 **–** Flee Market

**1NF (First Normal Form)**: No repeating groups.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ItemID | SellerName | ItemName | Category | Price | Qty | Description | Condition | Location | Date  Listed |
| 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 (Second Normal Form)**: Removing partial dependencies.

Table: Seller

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

Table: Item

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ItemID | ItemName | Category | Price | Qty | 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 |

Table: Seller Item Mapping

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

**3NF (Third Normal Form)**: No transitive dependencies.

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QUESTION NO: 6 **–** Learning Management System

**1NF (First Normal Form)**: No repeating groups.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 (Second Normal Form)**: Removing partial dependencies.

Table: Course

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

Table: Course Details

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

Table: Instructor

|  |  |
| --- | --- |
| InstructorID | Instructor |
| 01 | Prof. Smith |
| 02 | Prof. Brown |
| 03 | Prof. Green |
| 04 | Prof. White |
| 05 | Prof. Black |

**3NF (Third Normal Form)**: No transitive dependencies.

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