# Experion ILP-Batch 1

# Task 1

**First Normal Form (1NF):**

- Ensure that each column contains atomic (indivisible) values.
- No repeating groups or arrays.

**Second Normal Form (2NF):**

- Fulfil the requirements of first normal form
- Each non-key attribute must be functionally dependent on the primary key

**Third Normal form(3NF):**

- Fulfils the requirements of second normal form
- Has no transitive functional dependency

## 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 |

★ **Removing Partial Dependency:**

| EmployeeID | EmployeeName |
|---|---|
| 1 | John Smith |
| 2 | Alice Brown |
| 3 | Mark Johnson |

★ **No transitive dependency**

★ **Making it more efficient:**

| Employee | |
|---|---|
| EmployeeID | EmployeeName |
| 1 | John Smith |

| 2 | Alice Brown |
|---|---|
| 3 | Mark Johnson |

| Department | |
|---|---|
| **Department_Id** | **Department** |
| 001 | HR |
| 002 | IT |
| 003 | Sales |

| Employee_Department_Mapping | | | | |
|---|---|---|---|---|
| **EmployeeID** | **Department_Id** | **ManagerID** | **Salary** | **HireDate** |
| 1 | 001 | 101 | 50000 | 2022-01-15 |
| 2 | 002 | 102 | 60000 | 2022-02-20 |
| 3 | 003 | 101 | 55000 | 2022-03-10 |

## 2. Training Programs

| Program ID | 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 |

### ★ Removing partial dependency

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

### ★ Removing transitive dependency

| EmployeeID | EmployeeName |
|---|---|
| 101 | Alice Brown |

| 102 | Bob Green |
|-----|-----|
| 103 | Charlie Black |

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

★ **Making it more efficient**

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

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

| Department | |
|-----|-----|
| **DepartmentID** | **DeptName** |
| D-101 | IT |
| D-102 | HR |
| D-103 | Sales |

| Employee_program_Department mapping | | | |
|-----------|--------------|------------|------|
| **ProgramID** | **DepartmentID** | **EmployeeID** | **Date** |
| 1 | D-101 | 101 | 2022-03-01 |
| 2 | D-102 | 102 | 2022-03-10 |
| 3 | D-103 | 103 | 2022-03-20 |

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 | 2022-02-20u |
| 3 | John Doe | 103 | Printer | 1 | 200 | 200 | 2022-03-10 |

★ **Removing partial dependency**

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

★ **Removing transitive dependency**

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

★ **Making it more efficient**

| Customer | |
|---|---|
| **Customer_ID** | **CustomerName** |
| 1 | John Doe |
| 2 | Jane Smith |
| 3 | John Doe |

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

| Product_Order_Customer_ mapping | | | | | |
|---|---|---|---|---|---|
| **OrderID** | **Customer_ID** | **ProductID** | **Qty** | **TotalAmount** | **OrderDate** |

| 1 | 1 | 101 | 2 | 1600 | 2022-01-15 |
| 2 | 2 | 102 | 1 | 500 | 2022-02-20u |
| 3 | 3 | 103 | 1 | 200 | 2022-03-10 |

### 4. Stress management

| Employee ID | FirstName | LastName | StressLevel | HoursOfWork | Breaks Taken | 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 |

★ **Removing partial dependency**

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

| StressLevelID | StressLevel |
|---|---|
| 1 | Low |
| 2 | Moderate |
| 3 | High |

★ **There is no transitive dependency in this case**

★ **Making it more efficient**

| Employee | | |
|---|---|---|
| EmployeeID | FirstName | LastName |
| 101 | Sarah | White |

| | | |
|---|---|---|
| 102 | Bob | Green |
| 103 | Charlie | Black |
| 104 | David | Miller |
| 105 | Jane | Doe |

| counseling | | |
|---|---|---|
| **EmployeeID** | **PhysicalActivity** | **CounselingSessions** |
| 101 | Yoga | 2 |
| 102 | Jogging | 1 |
| 103 | Meditation | 3 |
| 104 | Gym | 2 |
| 105 | Walking | 1 |

| Stress | |
|---|---|
| **StressLevelID** | **StressLevel** |
| 1 | Low |
| 2 | Moderate |
| 3 | High |

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

### 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 |

| ItemID | SellerName | ItemName | Category | Price | Quantity | Description | Condition | Location | Date |
|---|---|---|---|---|---|---|---|---|---|
| 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 |

★ **Removing partial dependency**

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

| SellerID | SellerName | Location |
|---|---|---|
| 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 |

★ **No transitive dependency in this table**

★ **Making it more efficient:**

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

| Seller | | |
|---|---|---|
| **SellerID** | **SellerName** | **Location** |
| 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 |

| Item_Seller_Mapping | | | |
|---|---|---|---|
| **ItemID** | **SellerID** | **Quantity** | **DateListed** |
| 101 | 101 | 2 | 2022-01-15 |
| 102 | 102 | 1 | 2022-02-20 |
| 103 | 103 | 10 | 2022-03-10 |

| 104 | 104 | 5 | 2022-04-05 |
| 105 | 105 | 1 | 2022-05-15 |

## 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 |

★ **Removing partial dependency**

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

| DepartmentID | Department |
|--------------|------------|
| 01 | Science |
| 02 | Computer Science |
| 03 | Finance |

| 04 | Humanities |
|----|-----------|
| 05 | IT |

★ **No Transitive dependency**

★ **Making it more efficient**

### Instructor

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

### Department

| DepartmentID | Department |
|----|-----------|
| 01 | Science |
| 02 | Computer Science |
| 03 | Finance |
| 04 | Humanities |
| 05 | IT |

### Instructor_Department_Course_Mapping

| CID | CourseName | InstructorId | DepartmentID | Credits | Enrolled Students | StartDate | EndDate | Location | Availability |
|-----|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| 101 | Introduction to Biology | 1 | 01 | 3 | 25 | 2022-01-15 | 2022-05-10 | Room 101 | Open |
| 102 | Programming in Python | 2 | 02 | 4 | 30 | 2022-02-20 | 2022-06-15 | Lab 3, Building B | Closed |
| 103 | Financial Accounting | 3 | 03 | 3 | 20 | 2022-03-10 | 2022-07-05 | Room 201 | Open |
| 104 | English Literature | 4 | 04 | 3 | 22 | 2022-04-05 | 2022-08-20 | Room 301 | Open |
| 105 | Web Developme | 5 | 05 | 4 | 28 | 2022-05-15 | 2022-09-25 | Lab 2, | Closed |

| | nt Fundamentals | | | | | | Building A | |
|---|---|---|---|---|---|---|---|---|