Experion ILP-Batch 1

Task 2

Case Study

Details:

Objective: Design a comprehensive database with well-normalized tables for a real-time domain of your choice. This case study will allow you to apply your knowledge of normalization concepts and database design principles in a practical setting.

Selected Domain: HR - Employee Leave Management System

Employee Leave Management System involves the management and tracking of employee leave requests within an organizational context. This system is designed to streamline and automate the process of requesting, approving, and tracking various types of leaves that employees may take during their tenure with a company.

The Employee Leave Management System holds significant relevance within a company as it plays a pivotal role in streamlining and organizing the crucial aspect of employee time off. Efficient leave management is essential for maintaining a balanced and productive workforce, ensuring that employees can take the necessary breaks without disrupting operations.

This system provides insights into an employee's leave history, offering a clear overview of the number of leaves taken to date and the remaining leave balance.

Tables:

1. Roles Table:

This table stores information about different roles in a system, such as Admin and User.

- RoleID
  - Datatype: VARCHAR(5)
  - Description: Unique identifier for each role.
  - Constraints: NOT NULL, Primary Key
- Role
  - Datatype: VARCHAR(20)
  - Description: Represents the name or title of the role (e.g., Admin, User).
  - Constraints: NOT NULL

2. Department Table

This table contains information about different departments in an organization, such as IT, HR, Finance, and Marketing.

- DeptID
  - Datatype: VARCHAR(5)
  - Description: Unique identifier for each department.
  - Constraints: NOT NULL, Primary Key
- Department
  - Datatype: VARCHAR(20)
  - Description: Represents the name or title of the department (e.g., IT, HR, Finance, Marketing).
  - Constraints: NOT NULL

3. **LeaveTypes Table**

This table contains information about various types of leaves available in an organization, including Vacation, Sick Leave, Personal Leave, Bereavement Leave, and Maternity Leave.

- LeaveTypeID
  - Datatype: VARCHAR(5)
  - Description: Unique identifier for each leave type.
  - Constraints: NOT NULL, Primary Key
- LeaveTypeName
  - Datatype: VARCHAR(30)
  - Description: Represents the name or title of the leave type (e.g., Vacation, Sick Leave, Personal Leave, Bereavement Leave, Maternity Leave).
  - Constraints: NOT NULL
- MaximumDaysAllowed
  - Datatype: INT
  - Description: Indicates the maximum number of days allowed for the specific leave type.
  - Constraints: NOT NULL

4. **LeaveStatus Table:**

This table contains information about different leave statuses, including Approved, Pending, and Rejected.

- StatusID
  - Datatype: VARCHAR(5)
  - Description: Unique identifier for each leave status.
  - Constraints: NOT NULL, Primary Key
- Status
  - Datatype: VARCHAR(20)
  - Description: Represents the status of a leave request (e.g., Approved, Pending, Rejected).
  - Constraints: NOT NULL

5. **Employee Table:**

This table contains information about employees, including details such as their Employee ID, first name, last name, gender, date of birth, phone number, and email.

- EmpID
  - Datatype: VARCHAR(5)
  - Description: Unique identifier for each employee.
  - Constraints: NOT NULL, Primary Key, Unique
- FirstName
  - Datatype: VARCHAR(20)
  - Description: The first name of the employee.
  - Constraints: NOT NULL
- LastName
  - Datatype: VARCHAR(20)
  - Description: The last name of the employee.
  - Constraints: NOT NULL
- Gender
  - Datatype: VARCHAR(10)
  - Description: Represents the gender of the employee.
  - Constraints: NOT NULL
- DoB (Date of Birth)
  - Datatype: DATE
  - Description: The date of birth of the employee.
  - Constraints: NOT NULL
- Phone
  - Datatype: BIGINT
  - Description: The phone number of the employee.
  - Constraints: NOT NULL, Unique
- Email
  - Datatype: VARCHAR(50)
  - Description: The email address of the employee.
  - Constraints: NOT NULL

6. **EmployeeDeptMap table:**

This table represents the mapping between employees and their respective departments, including details such as Employee Department Mapping ID (EDmID), Employee ID (EmpID), Department ID (DeptID), Joining Date, and Status.

- EDmID
  - Datatype: VARCHAR(5)
  - Description: Unique identifier for each employee department mapping.
  - Constraints: NOT NULL, Primary Key
- EmpID
  - Datatype: VARCHAR(5)
  - Description: Identifier linking to the employee in the Employee table.
  - Constraints: NOT NULL, Foreign Key (references Employee.EmpID)

- DeptID
    - Datatype: VARCHAR(5)
    - Description: Identifier linking to the department in the Department table.
    - Constraints: NOT NULL, Foreign Key (references Department.DeptID)
- JoiningDate
    - Datatype: DATE
    - Description: The date when the employee joined the department.
    - Constraints: NOT NULL
- Status
    - Datatype: VARCHAR(50)
    - Description: Represents the status of the employee in the department (e.g., Joined, Left).
    - Constraints: NOT NULL

7. User Table:

This table contains information about user credentials, including details such as User ID (UserID), Username, Encrypted Password, and Email.

- UserID
    - Datatype: VARCHAR(5)
    - Description: Unique identifier for each user.
    - Constraints: NOT NULL, Primary Key
- Username
    - Datatype: VARCHAR(20)
    - Description: The username chosen by the user for authentication.
    - Constraints: NOT NULL
- Password
    - Datatype: VARCHAR(50)
    - Description: Encrypted password for user authentication.
    - Constraints: NOT NULL
- Email
    - Datatype: VARCHAR(50)
    - Description: The email address associated with the user.
    - Constraints: NOT NULL

8. UserRole Table:

This table represents the mapping between users, employees, and their assigned roles. It includes details such as User Role ID (UR-ID), User ID (UserID), Employee ID (EmpID), and Role ID (RoleID)

- UR-ID
    - Datatype: VARCHAR(5)
    - Description: Unique identifier for each user role mapping.
    - Constraints: NOT NULL, Primary Key
- UserID
    - Datatype: VARCHAR(5)

- o Description: Identifier linking to the user in the UserCredentials table.
- o Constraints: NOT NULL, Foreign Key (references UserCredentials.UserID)
- EmpID
  - o Datatype: VARCHAR(5)
  - o Description: Identifier linking to the employee in the EmployeeDepartmentMapping table.
  - o Constraints: NOT NULL, Foreign Key (references EmployeeDepartmentMapping.EmpID)
- RoleID
  - o Datatype: VARCHAR(5)
  - o Description: Identifier linking to the role in the Roles table.
  - o Constraints: NOT NULL, Foreign Key (references Roles.RoleID)

9. LeaveRequests table:

This table contains information about leave requests made by employees, including details such as Request ID (RequestID), Employee ID (EmployeeID), Leave Type ID (LeaveTypeID), Start Date, End Date, and Request Date.

- RequestID
  - o Datatype: VARCHAR(5)
  - o Description: Unique identifier for each leave request.
  - o Constraints: NOT NULL, Primary Key
- EmployeeID
  - o Datatype: VARCHAR(5)
  - o Description: Identifier linking to the employee in the Employee table.
  - o Constraints: NOT NULL, Foreign Key (references Employee.EmpID)
- LeaveTypeID
  - o Datatype: VARCHAR(5)
  - o Description: Identifier linking to the leave type in the LeaveTypes table.
  - o Constraints: NOT NULL, Foreign Key (references LeaveTypes.LeaveTypeID)
- StartDate
  - o Datatype: DATE
  - o Description: The start date of the leave request.
  - o Constraints: NOT NULL
- EndDate
  - o Datatype: DATE
  - o Description: The end date of the leave request.
  - o Constraints: NOT NULL
- RequestDate
  - o Datatype: DATE
  - o Description: The date when the leave request was submitted.
  - o Constraints: NOT NULL

10. LeaveRequestStatus table:

This table contains information about the status of leave requests, including details such as Request Status ID (RequestStatusID), Request ID (RequestID), and Status.
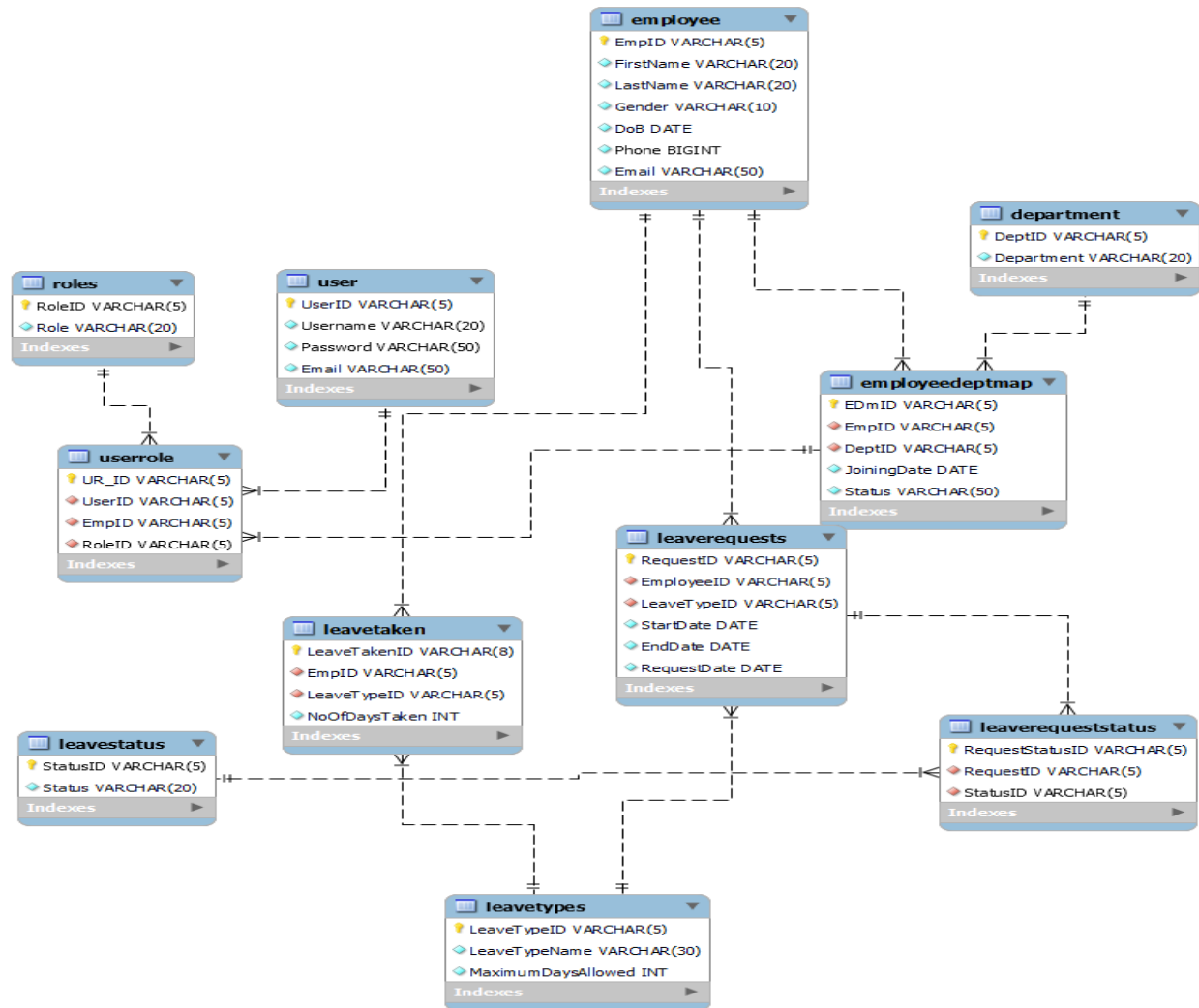
- RequestStatusID
    - Datatype: VARCHAR(5)
    - Description: Unique identifier for each leave request status.
    - Constraints: NOT NULL, Primary Key
- RequestID
    - Datatype: VARCHAR(5)
    - Description: Identifier linking to the leave request in the LeaveRequests table.
    - Constraints: NOT NULL, Foreign Key (references LeaveRequests.RequestID)
- StatusID
    - Datatype: VARCHAR(5)
    - Description: Identifier linking to the status in the LeaveStatus table.
    - Constraints: NOT NULL, Foreign Key (references LeaveStatus.StatusID)

11. LeaveTaken Table:

This table contains information about the leave taken by employees, including details such as Leave Taken ID (LeaveTakenID), Employee ID (EmpID), Leave Type ID (LeaveTypeID), and the number of days taken (NoOfDaysTaken).

- LeaveTakenID
    - Datatype: VARCHAR(8)
    - Description: Unique identifier for each record of leave taken.
    - Constraints: NOT NULL, Primary Key
- EmpID
    - Datatype: VARCHAR(5)
    - Description: Identifier linking to the employee in the Employee table.
    - Constraints: NOT NULL, Foreign Key (references Employee.EmpID)
- LeaveTypeID
    - Datatype: VARCHAR(5)
    - Description: Identifier linking to the leave type in the LeaveTypes table.
    - Constraints: NOT NULL, Foreign Key (references LeaveTypes.LeaveTypeID)
- NoOfDaysTaken
    - Datatype: INT
    - Description: The number of days of leave taken by the employee.
    - Constraints: NOT NULL

Entity Relationship Diagram:

Normalization

Role Table:

RoleID	Role
R-1	Admin
R-2	User

Department Table:

DeptID	Department
D-1	IT
D-2	HR
D-3	Finance
D-4	Marketing

Leave Types Table:

LeaveTypeID	LeaveTypeName	MaximumDaysAllowed
LT-1	Vacation	12
LT-2	Sick Leave	10
LT-3	Personal Leave	7
LT-4	Bereavement Leave	5
LT-5	Maternity Leave	20

LeaveStatus table:

StatusID	Status
RsQ-1	Approved
RsQ-2	Pending
RsQ-3	Rejected

Employee Table:

EmpID	FirstName	LastName	Gender	DoB	Phone	Email
E-1	John	Doe	M	1990-05-15	123-456-7890	john.doe@email.com
E-2	Jane	Smith	F	1985-08-22	987-654-3210	jane.smith@email.com
E-3	Mark	Johnson	M	1992-03-10	555-123-4567	mark.johnson@email.com
E-4	Emily	Davis	F	1988-11-30	111-222-3333	emily.davis@email.com
E-5	Michael	Lee	M	1995-07-18	777-888-9999	michael.lee@email.com

EmployeeDeptMap table:

EDmID	EmpID	DeptID	JoiningDate	Status
EDm-1	E-1	D-1	19-10-2016	Joined
EDm-2	E-2	D-2	18-10-2019	Joined
EDm-3	E-3	D-3	29-02-2020	Joined
EDm-4	E-4	D-4	29-05-2021	Joined
EDm-5	E-5	D-1	07-12-2023	Joined

User Table:

UserID	Username	Password	Email
U-1	john_doe	<encrypted_pwd>	john.doe@email.com
U-2	jane_smith	<encrypted_pwd>	jane.smith@email.com
U-3	mark_johnson	<encrypted_pwd>	mark.johnson@email.com
U-4	emily_davis	<encrypted_pwd>	emily.davis@email.com
U-5	michael_lee	<encrypted_pwd>	michael.lee@email.com

UserRole Table:

UR-ID	UserID	EmpID	RoleID
UR-1	U-1	E-1	R-2
UR-2	U-2	E-2	R-1
UR-3	U-3	E-3	R-2
UR-4	U-4	E-4	R-2
UR-5	U-5	E-5	R-2

LeaveRequests table:

RequestID	EmployeeID	LeaveTypeID	StartDate	EndDate	RequestDate
RQ-1	E-1	LT-1	15-12-2023	18-12-2023	10-12-2023
RQ-2	E-3	LT-3	01-12-2023	05-12-2023	05-10-2023
RQ-3	E-5	LT-4	05-01-2024	07-01-2024	14-12-2023
RQ-4	E-3	LT-2	12-12-2023	12-12-2023	12-12-2023
RQ-5	E-2	LT-1	15-12-2023	16-12-2023	04-12-2023

LeaveRequestStatus table:

RequestStatusID	RequestID	StatusID
RS-1	RQ-1	RsQ-1
RS-2	RQ-2	RsQ-2
RS-3	RQ-3	RsQ-2
RS-4	RQ-4	RsQ-3
RS-5	RQ-5	RsQ-1

LeaveTaken Table:

LeaveTakenID	EmpID	LeaveTypeID	NoOfDaysTaken
LTkn-1	E-1	LT-1	4
LTkn-2	E-2	LT-1	2