DBMS Documentation:

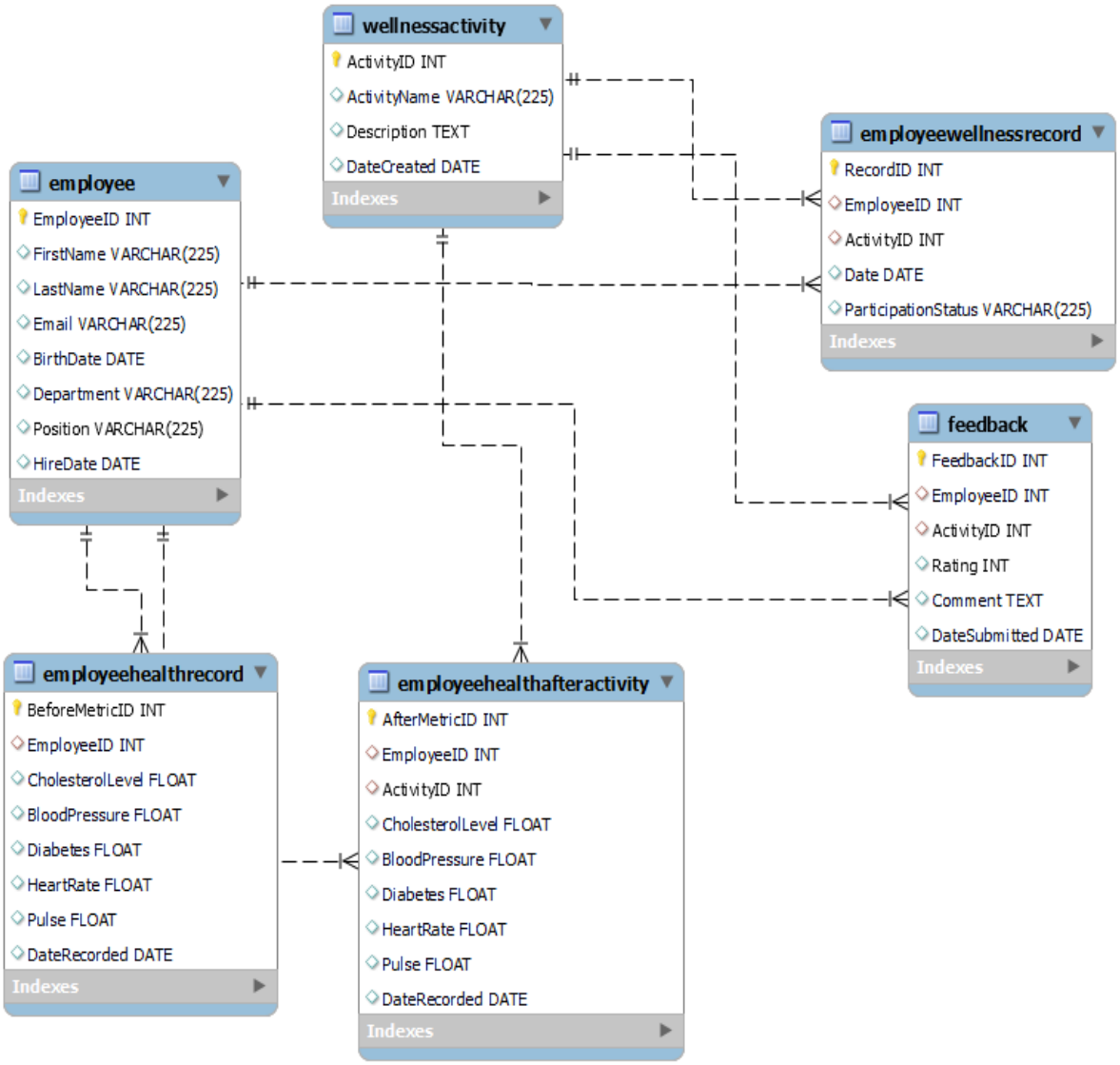
Domain Description:

The chosen domain for this database design is an Employee Wellness Program. Employee wellness programs are initiatives implemented by organizations to promote the overall well-being of their employees. These programs often include activities related to physical fitness, mental health, and lifestyle improvements.

Background Study and Requirement Analysis:

Before designing the database, a thorough background study and requirement analysis were conducted to understand the needs of the Employee Wellness Program. The analysis involved identifying key entities, their attributes, and the relationships between them. The main entities identified were Employee, Wellness Activity, Employee Wellness Record, Employee Health Record, Employee Health After Activity, and Feedback.

Entity-Relationship Diagram (ERD):



The ERD was created using MySQL Workbench to visually represent the structure of the database and the relationships between different entities.

Table Descriptions:

- **Employee Table:**
  - EmployeeID (Primary Key): Unique identifier for each employee.
  - FirstName: First name of the employee.
  - LastName: Last name of the employee.
  - Email: Email address of the employee.
  - BirthDate: Date of birth of the employee.
  - Department: The department to which the employee belongs.
  - Position: Job position/title of the employee.
  - HireDate: Date when the employee was hired.

- **WellnessActivity Table:**
  - ActivityID (Primary Key): Unique identifier for each wellness activity.
  - ActivityName: Name of the wellness activity.
  - Description: Detailed description of the wellness activity.
  - DateCreated: Date when the wellness activity was created.
- **EmployeeWellnessRecord Table:**
  - RecordID (Primary Key): Unique identifier for each wellness record.
  - EmployeeID (Foreign Key): References Employee Table (EmployeeID).
  - ActivityID (Foreign Key): References WellnessActivity Table (ActivityID).
  - Date: Date of the wellness activity record.
  - ParticipationStatus: Status indicating whether the employee participated in the activity.
- **EmployeeHealthRecord Table:**
  - BeforeMetricID (Primary Key): Unique identifier for each health record before an activity.
  - EmployeeID (Foreign Key): References Employee Table (EmployeeID).
  - CholesterolLevel: Cholesterol level of the employee.
  - BloodPressure: Blood pressure of the employee.
  - Diabetes: Presence of diabetes (boolean).
  - HeartRate: Heart rate of the employee.
  - Pulse: Pulse rate of the employee.
  - DateRecorded: Date when the health metrics were recorded.

- **EmployeeHealthAfterActivity Table:**
  - AfterMetricID (Primary Key): Unique identifier for each health record after an activity.
  - EmployeeID (Foreign Key): References Employee Table (EmployeeID).
  - ActivityID (Foreign Key): References WellnessActivity Table (ActivityID).

    - CholesterolLevel: Cholesterol level of the employee after the activity.
    - BloodPressure: Blood pressure of the employee after the activity.
    - Diabetes: Presence of diabetes after the activity (boolean).
    - HeartRate: Heart rate of the employee after the activity.
    - Pulse: Pulse rate of the employee after the activity.
    - DateRecorded: Date when the health metrics after the activity were recorded.
- **Feedback Table:**
    - FeedbackID (Primary Key): Unique identifier for each feedback.
    - EmployeeID (Foreign Key): References Employee Table (EmployeeID).
    - ActivityID (Foreign Key): References WellnessActivity Table (ActivityID).
    - Rating: Numeric rating given by the employee for the activity.
    - Comment: Additional comments provided by the employee.
    - DateSubmitted: Date when the feedback was submitted.

Relationships between Tables:

- **Employee Table and EmployeeWellnessRecord Table:**
    - One-to-Many Relationship.
    - An employee can have multiple wellness records, but each wellness record is associated with only one employee.
    - Relationship established through the EmployeeID foreign key in the EmployeeWellnessRecord table referencing the EmployeeID primary key in the Employee table.
- **WellnessActivity Table and EmployeeWellnessRecord Table:**
    - One-to-Many Relationship.
    - A wellness activity can have multiple wellness records, but each wellness record is associated with only one wellness activity.
    - Relationship established through the ActivityID foreign key in the EmployeeWellnessRecord table referencing the ActivityID primary key in the WellnessActivity table.
- **Employee Table and EmployeeHealthRecord Table:**
    - One-to-Many Relationship.
    - An employee can have multiple health records, but each health record is associated with only one employee.
    - Relationship established through the EmployeeID foreign key in the EmployeeHealthRecord table referencing the EmployeeID primary key in the Employee table.
- **Employee Table and EmployeeHealthAfterActivity Table:**
    - One-to-Many Relationship.
    - An employee can have multiple health records after activities, but each health record after an activity is associated with only one employee.

    - Relationship established through the EmployeeID foreign key in the EmployeeHealthAfterActivity table referencing the EmployeeID primary key in the Employee table.
- **WellnessActivity Table and EmployeeHealthAfterActivity Table:**
    - One-to-Many Relationship.
    - A wellness activity can have multiple health records after the activity, but each health record after an activity is associated with only one wellness activity.
    - Relationship established through the ActivityID foreign key in the EmployeeHealthAfterActivity table referencing the ActivityID primary key in the WellnessActivity table.
- **Employee Table and Feedback Table:**
    - One-to-Many Relationship.
    - An employee can provide multiple feedback, but each feedback is associated with only one employee.
    - Relationship established through the EmployeeID foreign key in the Feedback table referencing the EmployeeID primary key in the Employee table.
- **WellnessActivity Table and Feedback Table:**
    - One-to-Many Relationship.
    - A wellness activity can receive multiple feedback, but each feedback is associated with only one wellness activity.
    - Relationship established through the ActivityID foreign key in the Feedback table referencing the ActivityID primary key in the WellnessActivity table.

Normalization Process:

The tables have been designed to adhere to normalization principles. The primary keys and foreign keys have been appropriately defined to establish relationships between tables. The database is in at least the Third Normal Form (3NF), as each non-prime attribute is fully functionally dependent on the primary key.

Normalization Steps:

- First Normal Form (1NF): All tables have atomic values, and there are no repeating groups.
- Second Normal Form (2NF): All non-prime attributes are fully functionally dependent on the primary key.
- Third Normal Form (3NF): No transitive dependencies exist, and all attributes are dependent only on the primary key.

- This comprehensive database design for the Employee Wellness Program ensures data integrity, minimizes redundancy, and provides a solid foundation for managing and analyzing employee wellness-related information in real-time.

Result:

In conclusion, the designed database for the Employee Wellness Program not only meets the requirements of the domain but also offers a robust, normalized structure that enhances data management, integrity, and analysis capabilities. This database serves as a foundation for efficiently managing and improving the overall well-being of employees within an organization.