

# **SD10 S3 Database Midterm Sprint**

## **NewfoundFitness Database**

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### **Database Scenario: Newfound Fitness – Introductory Paragraph**

A local commercial gym offers a wide range of fitness programs, exercise equipment, nutritional supplements, and classes to its members. The local gym only has one location but offers a wide variety of services including: personal training, group fitness classes, and memberships. It also has other revenues of income such as selling workout supplements. Newfound Fitness is currently in the market for developing a database to better track their incoming revenue, staff, and membership information. By implementing this database system, they hope to optimize their resource allocation and improve member engagement by accessing data trends.

Like most businesses, Newfound Fitness will require a Point of Sale (PoS) system to keep track of both member and sales transactions. For the members, they pay their membership fees monthly and classes as they are needed. Workout supplements and protein shakes are also purchased through the same PoS system. Owners ultimately want to track inventory trends such as what products sell the most, what census is buying what product, and when products are being sold. They also want to keep track of what fitness classes are most popular and the age cohorts for each class. Knowing this information will help them better serve their clients and provide fitness options that are in line with their client's needs.

#### **Entities:**

- Location: Location of gym and future gyms.
- Staff: Information about staff working at the gym including full name, salary, and employee number
- Membership Plans: Information about all of the current offered plans for gym members.
- Equipment: A complete inventory of all gym equipment including purchase date, muscle group, and maintenance schedule
- Fitness classes: A list of current offered classes that describes the type of class, max capacity, and instructor
- Supplements: complete list of supplements available
- Receipt: information about sales to the member, this will include all information found on the receipt.

*Note – other entities exist such as addresses, inventories, services employee has skills, etc. Consider these... make sample data in a spreadsheet, think it through, normalize.*

### **NewfoundFitness Database Documentation**

#### **1.0 Entities, Attributes, and Relationships**

##### **1. Person\_Information:**

###### **○ Attributes:**

- Person\_ID: Primary key.
- First\_Name: First name of the person.

- Last\_Name: Last name of the person.
  - Email: Email address of the person.
  - Phone\_Number: Phone number of the person.
  - **Relationships:**
    - **Membership:** One-to-Many (1:N) - One person can have multiple memberships.
    - **Staff:** One-to-One (1:1) - One person can be a staff member.
    - **Class\_Attendance:** One-to-Many (1:N) - One person can attend multiple classes.
- 2. **Province:**
  - **Attributes:**
    - Province\_ID: Primary key.
    - Province\_Name: Name of the province.
    - Province\_Code: Code of the province.
  - **Relationships:**
    - **Address:** One-to-Many (1:N) - One province can have multiple addresses.
    - **Staff\_Address:** One-to-Many (1:N) - One province can have multiple staff addresses.
- 3. **Address:**
  - **Attributes:**
    - Address\_ID: Primary key.
    - Street\_Name: Street name of the address.
    - Street\_Number: Street number of the address.
    - City: City of the address.
    - Province\_ID: Foreign key referencing Province.
    - Postal\_Code: Postal code of the address.
  - **Relationships:**
    - **Membership:** One-to-Many (1:N) - One address can be associated with multiple memberships.
    - **Gym\_Location:** One-to-Many (1:N) - One address can be associated with multiple gym locations.
    - **Staff:** One-to-Many (1:N) - One address can be associated with multiple staff members.
- 4. **Price:**
  - **Attributes:**
    - Price\_ID: Primary key.
    - Price\_Amount: Amount of the price.
  - **Relationships:**
    - **Membership:** One-to-Many (1:N) - One price can be associated with multiple memberships.
    - **Fitness\_Class:** One-to-Many (1:N) - One price can be associated with multiple fitness classes.
    - **Services:** One-to-Many (1:N) - One price can be associated with multiple services.
    - **Supplements:** One-to-Many (1:N) - One price can be associated with multiple supplements.
- 5. **Salary:**
  - **Attributes:**
    - Salary\_ID: Primary key.
    - Salary\_Amount: Amount of the salary.
  - **Relationships:**
    - **Staff:** One-to-Many (1:N) - One salary can be associated with multiple staff members.
- 6. **Membership\_Type:**

- **Attributes:**
    - Membership\_Type\_ID: Primary key.
    - Type\_Name: Name of the membership type.
    - Description: Description of the membership type.
  - **Relationships:**
    - **Membership:** One-to-Many (1:N) - One membership type can be associated with multiple memberships.
7. **Membership:**
- **Attributes:**
    - Member\_ID: Primary key.
    - Person\_ID: Foreign key referencing Person\_Information.
    - Address\_ID: Foreign key referencing Address.
    - Price\_ID: Foreign key referencing Price.
    - Membership\_Type\_ID: Foreign key referencing Membership\_Type.
    - Membership\_Length: Length of the membership.
    - Date\_Joined: Date the membership was joined.
    - Expiration\_Date: Expiration date of the membership.
8. **Equipment:**
- **Attributes:**
    - Equipment\_ID: Primary key.
    - Equipment\_Name: Name of the equipment.
    - Purchase\_Date: Date the equipment was purchased.
    - Availability\_Status: Status of the equipment.
  - **Relationships:**
    - **Equipment\_Maintenance:** One-to-Many (1:N) - One equipment can have multiple maintenance records.
9. **Staff:**
- **Attributes:**
    - Staff\_ID: Primary key.
    - Person\_ID: Foreign key referencing Person\_Information.
    - Staff\_Address\_ID: Foreign key referencing Staff\_Address.
    - Salary\_ID: Foreign key referencing Salary.
  - **Relationships:**
    - **Fitness\_Class:** One-to-Many (1:N) - One staff member can teach multiple fitness classes.
    - **Schedule:** One-to-Many (1:N) - One staff member can have multiple schedules.
    - **Equipment\_Maintenance:** One-to-Many (1:N) - One staff member can perform multiple equipment maintenance tasks.
    - **Employee\_Certifications:** One-to-Many (1:N) - One staff member can have multiple certifications.
    - **Inventory\_Log:** One-to-Many (1:N) - One staff member can log multiple inventory changes.
    - **Gym\_Location:** One-to-Many (1:N) - One staff member can manage multiple gym locations.
10. **Staff\_Address:**
- **Attributes:**
    - Staff\_Address\_ID: Primary key.
    - Street\_Name: Street name of the address.
    - Street\_Number: Street number of the address.
    - City: City of the address.
    - Province\_ID: Foreign key referencing Province.
    - Postal\_Code: Postal code of the address.
  - **Relationships:**

- **Staff:** One-to-Many (1:N) - One staff address can be associated with multiple staff members.

#### 11. **Gym\_Location:**

- **Attributes:**
  - Gym\_ID: Primary key.
  - Address\_ID: Foreign key referencing Address.
  - Manager\_ID: Foreign key referencing Staff.
- **Relationships:**
  - **Address:** One-to-One (1:1) - One address can be associated with one gym location.
  - **Staff:** One-to-One (1:1) - One staff member can manage one gym location.

#### 12. **Tax:**

- **Attributes:**
  - Tax\_ID: Primary key.
  - Tax\_Name: Name of the tax.
  - Tax\_Rate: Rate of the tax.
  - Is\_Active: Whether the tax is active.
  - Effective\_Date: Date the tax becomes effective.
  - Description: Description of the tax.
- **Relationships:**
  - **Receipt:** One-to-Many (1:N) - One tax can be associated with multiple receipts.

#### 13. **Receipt:**

- **Attributes:**
  - Receipt\_ID: Primary key.
  - Member\_ID: Foreign key referencing Membership.
  - Payment\_Method: Method of payment.
  - Tax\_ID: Foreign key referencing Tax.
  - Subtotal: Subtotal amount.
  - Tax\_Amount: Tax amount.
  - Total\_Amount: Total amount.
  - Receipt\_Date: Date of the receipt.
- **Relationships:**
  - **Receipt\_Item:** One-to-Many (1:N) - One receipt can have multiple receipt items.

#### 14. **Fitness\_Class:**

- **Attributes:**
  - Class\_ID: Primary key.
  - Staff\_ID: Foreign key referencing Staff.
  - Price\_ID: Foreign key referencing Price.
  - Maximum\_Capacity: Maximum capacity of the class.
  - Class\_Name: Name of the class.
  - Description: Description of the class.
  - Duration: Duration of the class.
- **Relationships:**
  - **Schedule:** One-to-Many (1:N) - One fitness class can have multiple schedules.
  - **Class\_Attendance:** One-to-Many (1:N) - One fitness class can have multiple attendance records.
  - **Receipt\_Item:** One-to-Many (1:N) - One fitness class can be associated with multiple receipt items.

#### 15. **Services:**

- **Attributes:**
  - Service\_ID: Primary key.
  - Service\_Name: Name of the service.
  - Description: Description of the service.

- Duration: Duration of the service.
- Price\_ID: Foreign key referencing Price.
- Is\_Taxable: Whether the service is taxable.
- **Relationships:**
  - **Receipt\_Item:** One-to-Many (1:N) - One service can be associated with multiple receipt items.

#### 16. Brands:

- **Attributes:**
  - Brand\_ID: Primary key.
  - Brand\_Name: Name of the brand.
  - Brand\_Description: Description of the brand.
- **Relationships:**
  - **Supplements:** One-to-Many (1:N) - One brand can have multiple supplements.

#### 17. Supplements:

- **Attributes:**
  - Supplement\_ID: Primary key.
  - Brand\_ID: Foreign key referencing Brands.
  - Price\_ID: Foreign key referencing Price.
  - Supplement\_Name: Name of the supplement.
  - Stock\_Amount: Amount of stock.
  - Reorder\_Number: Reorder number.
  - Min\_Stock\_Level: Minimum stock level.
  - Max\_Stock\_Level: Maximum stock level.
- **Relationships:**
  - **Inventory\_Log:** One-to-Many (1:N) - One supplement can have multiple inventory log entries.
  - **Receipt\_Item:** One-to-Many (1:N) - One supplement can be associated with multiple receipt items.

#### 18. Schedule:

- **Attributes:**
  - Schedule\_ID: Primary key.
  - Fitness\_Class\_ID: Foreign key referencing Fitness\_Class.
  - Staff\_ID: Foreign key referencing Staff.
  - Start\_Time: Start time of the schedule.
  - End\_Time: End time of the schedule.
- **Relationships:**
  - **Fitness\_Class:** One-to-Many (1:N) - One fitness class can have multiple schedules.
  - **Staff:** One-to-Many (1:N) - One staff member can have multiple schedules.

#### 19. Equipment\_Maintenance:

- **Attributes:**
  - Maintenance\_ID: Primary key.
  - Equipment\_ID: Foreign key referencing Equipment.
  - Maintenance\_Date: Date of maintenance.
  - Description: Description of the maintenance.
  - Performed\_By: Foreign key referencing Staff.
- **Relationships:**
  - **Equipment:** One-to-Many (1:N) - One equipment can have multiple maintenance records.
  - **Staff:** One-to-Many (1:N) - One staff member can perform multiple maintenance tasks.

#### 20. Certifications:

- **Attributes:**

- Certification\_ID: Primary key.
  - Certification\_Name: Name of the certification.
  - Certification\_Description: Description of the certification.
  - Issuing\_Organization: Organization issuing the certification.
  - Certification\_Level: Level of the certification.
  - **Relationships:**
    - **Employee\_Certifications:** One-to-Many (1:N) - One certification can be associated with multiple employee certifications.
21. **Employee\_Certifications:**
- **Attributes:**
    - Employee\_Certification\_ID: Primary key.
    - Staff\_ID: Foreign key referencing Staff.
    - Certification\_ID: Foreign key referencing Certifications.
    - Date\_Obtained: Date the certification was obtained.
    - Expiration\_Date: Expiration date of the certification.
    - Certificate\_Number: Certificate number.
  - **Relationships:**
    - **Staff:** One-to-Many (1:N) - One staff member can have multiple certifications.
    - **Certifications:** One-to-Many (1:N) - One certification can be associated with multiple staff members.
22. **Inventory\_Log:**
- **Attributes:**
    - Log\_ID: Primary key.
    - Supplement\_ID: Foreign key referencing Supplements.
    - Change\_Amount: Amount of change in stock.
    - New\_Stock\_Amount: New stock amount after the change.
    - Log\_Date: Date of the log entry.
    - Staff\_ID: Foreign key referencing Staff.
    - Log\_Type: Type of log entry (e.g., 'Restock', 'Sale', 'Adjustment', 'Expired').
    - Notes: Additional notes.
  - **Relationships:**
    - **Supplements:** One-to-Many (1:N) - One supplement can have multiple inventory log entries.
    - **Staff:** One-to-Many (1:N) - One staff member can log multiple inventory changes.
23. **Receipt\_Item:**
- **Attributes:**
    - Receipt\_Item\_ID: Primary key.
    - Receipt\_ID: Foreign key referencing Receipt.
    - Supplement\_ID: Foreign key referencing Supplements.
    - Fitness\_Class\_ID: Foreign key referencing Fitness\_Class.
    - Service\_ID: Foreign key referencing Services.
    - Quantity: Quantity of the item.
    - Price\_ID: Foreign key referencing Price.
    - Item\_Subtotal: Subtotal amount for the item.
    - Item\_Tax\_Amount: Tax amount for the item.
    - Item\_Total: Total amount for the item.
  - **Relationships:**
    - **Receipt:** One-to-Many (1:N) - One receipt can have multiple receipt items.
    - **Supplements:** One-to-Many (1:N) - One supplement can be associated with multiple receipt items.
    - **Fitness\_Class:** One-to-Many (1) - One fitness class can be associated with multiple receipt items.

- **Services:** One-to-Many (1:N) - One service can be associated with multiple receipt items.

#### 24. **Class\_Attendance:**

- **Attributes:**
  - Attendance\_ID: Primary key.
  - Class\_ID: Foreign key referencing Fitness\_Class.
  - Person\_ID: Foreign key referencing Person\_Information.
  - Attendance\_Date: Date of attendance.
- **Relationships:**
  - **Fitness\_Class:** One-to-Many (1:N) - One fitness class can have multiple attendance records.
  - **Person\_Information:** One-to-Many (1:N) - One person can attend multiple classes.

## 2.0 VIEWS SUMMARY

These views collectively provide a comprehensive set of tools for analyzing various aspects of the NewfoundFitness operations, from member engagement and equipment management to financial performance and class attendance. They are valuable additions that offer insights into different facets of the business.

1. **vw\_Class\_Attendance\_Summary:** This view provides a summary of class attendance, including the class ID, class name, person ID of attendees, and their age. It combines information from the Fitness\_Class, Class\_Attendance, and Person\_Information tables. This view is useful for analyzing class popularity among different age groups and tracking individual attendance.
2. **vw\_equipment\_status:** This view offers a comprehensive status report for gym equipment. It includes equipment details (ID, name, purchase date, availability status), the last maintenance date, and the next scheduled maintenance date (set to 90 days after the last maintenance). This view helps in equipment management and maintenance scheduling.
3. **vw\_member\_activity:** This view provides an overview of member activities and spending. It includes member ID, full name, total purchases, total amount spent, number of classes attended, services used, and supplements purchased. This information is valuable for understanding member engagement and spending patterns.
4. **vw\_member\_overview:** This view presents a comprehensive overview of gym members. It includes personal information (ID, name, email), membership details (type, join date, expiration date), and location information (city, province). This view is useful for member management and demographic analysis.
5. **vw\_Monthly\_Revenue\_Analysis\_By\_Category:** This view offers a detailed monthly revenue analysis broken down by category (Supplements, Classes, Services, Other). It calculates the revenue for each category, total monthly revenue, and the percentage each category contributes to the total. This view is crucial for financial analysis and identifying trends in different revenue streams.
6. **vw\_Protein\_Shake\_Sales\_Trend\_Report:** This view focuses on the sales trends of protein shakes. It aggregates data from the Receipt\_Item and Supplements tables, providing information on each shake's ID, name, total quantity sold, and total revenue generated. This view is useful for analyzing the popularity and profitability of different protein shakes, helping in inventory management and marketing decisions.

7. **vw\_Recent\_Inventory\_Movement\_Report:** This view offers a detailed report of recent inventory movements. It combines data from Inventory\_Log, Supplements, Staff, and Person\_Information tables to show the last 50 inventory changes. The report includes information such as the supplement name, change amount, new stock amount, date of change, staff responsible, log type, and any notes. This view is crucial for tracking inventory changes and identifying any unusual patterns or discrepancies.
8. **vw\_sales\_summary:** This view provides a daily sales summary, breaking down revenue by category. It aggregates data from the Receipt and Receipt\_Item tables, showing the total number of transactions, total revenue, and revenue specifically from supplements, fitness classes, and services for each day. This view is invaluable for daily sales analysis and tracking performance across different revenue streams.
9. **vw\_staff\_details:** This view offers a comprehensive overview of staff information. It combines data from Staff, Person\_Information, Salary, Employee\_Certifications, Staff\_Address, and Province tables. The view provides each staff member's ID, name, email, city, province, salary, and the count of their certifications. This view is useful for HR management, payroll, and analyzing staff qualifications and distribution.
10. **vw\_supplement\_inventory:** This view presents a current snapshot of the supplement inventory. It joins data from Supplements, Brands, and Price tables to show each supplement's ID, name, brand, current stock amount, reorder number, minimum and maximum stock levels, and current price. This view is essential for inventory management, pricing strategies, and ensuring optimal stock levels of supplements.

### 3.0 SQL QUERY SUMMARY

1. **Select\_All\_Queries:** This script contains SELECT \* statements for all tables in the database. It's useful for quickly checking the content of each table and verifying that data has been imported correctly.
2. **Service\_Type\_Popularity\_and\_Profitability\_Analysis:** This query analyzes the popularity and profitability of different service types. It calculates metrics such as times booked, total units sold, total revenue, and average price per unit for each service. It then ranks services based on revenue and popularity, creating an overall performance score.
3. **Staff\_Certifications\_Report:** This query lists all staff members along with their certifications. It provides details such as the staff member's name, position, certification name, description, issuing organization, and certification level.
4. **Staff\_Performance\_and\_Certification\_Impact\_Report:** This query analyzes how staff certifications correlate with class popularity and revenue generation. It combines information about staff certifications with class performance metrics like the number of classes taught, total attendees, and total revenue.
5. **Supplement\_Sales\_Inventory\_Turnover\_Report:** This query examines the sales and inventory turnover of supplements. It calculates metrics such as total sold, total revenue, turnover rate, and estimated stock duration for each supplement.
6. **Inventory\_Movement\_Report:** This query provides a recent inventory movement report for supplements. It shows the last 50 inventory changes, including details such as the supplement name, change amount, new stock amount, date of change, staff responsible, log type, and any



notes. This report is crucial for tracking inventory fluctuations and identifying any unusual patterns or discrepancies.

7. **Maintenance\_Schedule\_Report:** This query generates an equipment maintenance schedule report. It displays information about each piece of equipment, including its ID, name, purchase date, availability status, last maintenance date, and next scheduled maintenance date. It also categorizes the maintenance status as 'Overdue', 'Due Soon', or 'Scheduled'. This report is essential for managing equipment maintenance and ensuring all gym equipment is in good working order.
8. **Membership\_Type\_Performance\_Analysis\_Report:** This query creates a function that analyzes the performance of different membership types. It returns a table with membership type name, member count, average membership length, total revenue for that type, and the percentage of total revenue it represents. The function can be filtered by membership type, allowing for both overall and specific membership type analysis. This report is valuable for understanding which membership types are most popular and profitable.
9. **Monthly\_Revenue\_Analysis\_Category:** This query provides a comprehensive view of revenue contribution by different product categories (Supplements, Classes, Services, Other) over time. It calculates the revenue for each category per month, the total monthly revenue, and the percentage each category contributes to the total. This analysis helps identify trends in product popularity and overall revenue patterns, which is crucial for strategic decision-making.
10. **Sales\_Report\_Top\_5\_Quarterly\_Sales\_Supplements:** This query identifies the top 5 selling supplements for each quarter. It provides the quantity sold and total revenue generated for each of these top-selling products. This report is useful for identifying the most popular supplements, tracking their sales performance over time, and informing inventory and marketing decisions.

## 4.0 ERD Diagram

