Department of Computer Science,
National University of Computer and Emerging Sciences, Islamabad

CS2005: Database Systems (Spring 2024)
Semester Project

Project groups: This project can be done within a group of three (3) students. There is no restriction on the selection of group members. Students are allowed to make groups according to their preferences. Cross-section groups are also allowed.

Submission: All submissions MUST be uploaded on Google Classroom. Solutions sent to the emails will not be graded. To avoid last-minute problems (unavailability of Google Classroom, load shedding, network down, etc.), you are strongly advised to start working on the project from day one.

You are required to use Visual Studio 19 or above and SQL Server for the project. Combine all your work in one file named ROLL_NUM_DB_P (e.g., 20i-1234_DB _P.zip). SUBMIT COMPLETE PROJECT. Submit the .zip file in the classroom within a given deadline. Failure to submit according to the above format would result in ZERO marks.

Deadline:
Milestone-1: Submission of ERD and Relational model - **26th April**
Milestone-2: Interfaces of the complete project **- 3rd May**
Milestone-3: Complete project including Database integrated with the frontend– **10th May**

Plagiarism: ZERO marks will be awarded if any significant part of the project is found plagiarized.

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FLEX TRAINER

This Flex Trainer management system is a Web app for gyms and health membership systems. It will help gym owners to keep records of registered members, guide which exercises and muscle groups to work out together, how much weight loss is required, their diet plans, logs of calories, and daily targets to achieve. So, keeping in mind the main features of Flex Trainer are to guide their members about their fitness goals.

Flex Trainer should be designed to facilitate the gym owners, trainers, and members to automate the operations of keeping records and store them in the form of a large and user-friendly database, further facilitating easy access to the personnel. The objective of the Flex Trainer is to provide a system that handles the information of the members using the application and maintaining their health care.

Every user involved in the system will have their own User Interface. You must create four interfaces:
- Member interface.
- Trainer Interface
- Gym Owner
- Admin Interface

Member Interface:

1. Registration and Login:

The user interface of the gym application provides a seamless experience for users to register and create their accounts securely. Upon registration, users fill out a registration form with essential details. Subsequently, they can log in using their credentials to access the full range of features offered by the application.

2. Workout Planning:

Users can create personalized workout plans tailored to their fitness goals and preferences. A workout plan will contain multiple exercises and an exercise can require a machine. Within the user interface, forms are provided for users to input details such as which muscle to target on which day, exercise routines, sets, reps, and rest intervals. These forms empower users to design effective workout regimens that suit their individual needs.

3. Workout Plan Reports:

In addition to creating their workout plans, users can explore a variety of existing workout plans available within the application. The interface offers reports of workout plans categorized based on different criteria such as plans created by the user themselves, plans shared by other users, and plans curated by trainers. Users can choose from a diverse selection of workout plans catering to various purposes such as weight loss, bulking, cutting, and more. The member should be able to filter the workout plans based on multiple attributes e.g. goal of the workout, workout schedule, experience level required, etc.

4. Diet Planning:

Users can also manage their nutrition and dietary intake through the gym application. Similar to workout planning, the interface provides forms for users to create customized diet plans according to their dietary requirements and fitness goals. A diet plan will have multiple meals, the user should also be able to know the nutritional value of the meal e.g. protein, carbs, fiber, and fat. Users should also specify potential allergens in the meal such as peanuts, gluten, lactose, etc.

5. Diet Plan Selection:

Apart from creating their diet plans, users have the option to select from a range of existing diet plans curated by other users or trainers. The interface presents users with multiple choices, including plans created by themselves, plans shared by other users, and plans designed by trainers. Users can browse through these options and choose a diet plan that aligns with their specific objectives, whether it be weight loss, muscle gain, or maintenance. The member should be able to filter the diet plans based on multiple attributes e.g. type of diet (Vegan, Vegetarian, etc), purpose (weight loss, muscle gain, etc), nutrition(high card, high protein, etc), diet plans created by a specific trainer etc.

6. Personal Training Sessions Booking:

Furthermore, the user interface facilitates the booking of personal training sessions with trainers. Users can access forms within the application to schedule one-on-one training sessions with trainers of their choice. This feature enables users to receive personalized guidance and support from experienced fitness professionals to optimize their workout routines and achieve their fitness goals effectively.

7. Trainer feedback:

The user will also be able to give feedback about to trainer and this feedback will be used to assign a rating to every trainer.

Note: Make an Excel sheet populate the Excel sheet with at least 50 records manually and then import the data to the tables from that sheet.

Trainer Interface:

1. Registration and Login:

The trainer interface of the gym application will provide the user with the option to register or log in. In the case of registration, the trainer will enter their personal information and select the name of the gym from the list of registered gyms (A trainer can work for more than one gym). The request will be sent to the selected gym owners for verification. The login form will allow trainers to access their accounts and manage their professional services within the platform.

2. Appointment Management:

Trainers are equipped with tools to efficiently manage their appointments through the application. Within the interface, trainers can view, schedule, reschedule, and cancel appointments with clients, ensuring smooth coordination of training sessions.

3. Workout Plan Creation:

Trainers can create and customize workout plans tailored to the specific needs and objectives of their clients. Forms within the interface enable trainers to add new workout plans, incorporating exercises, sets, reps, and other parameters to design effective training regimens.

4. Diet Plan Creation:

In addition to workout planning, trainers can create personalized diet plans for their clients to optimize their nutrition and support their fitness goals. The interface provides forms for trainers to add new diet plans, specifying meal options, portion sizes, and nutritional guidelines according to their clients' dietary requirements.

5. Workout Plan:

Trainers can access comprehensive reports of workout plans within the interface, allowing them to track the progress and adherence of their clients to the prescribed training regimens. These reports provide valuable insights into the effectiveness of the workout plans and enable trainers to make informed adjustments as needed. The trainer should also be able to filter the workouts and generate reports based on different attributes.

6. Diet Plan:

Similarly, trainers have access to reports of diet plans, providing visibility into their clients' nutritional habits and compliance with the recommended dietary guidelines. These reports assist trainers in monitoring their clients' dietary intake and making necessary adjustments to optimize their nutrition for improved fitness outcomes. The trainer should also be able to filter the diet plans and generate reports based on different attributes.

7. Trainer Feedback:

The trainer would be able to see the feedback given by the gym members, there will be a combined rating of the trainer in which reviews from all the gyms will be included and then there will also be a rating separately for every gym.

Through these functionalities, the trainer interface empowers fitness professionals to deliver personalized training and nutrition guidance, monitor client progress, and streamline their administrative tasks for enhanced efficiency and client satisfaction.

<u>**Gym Owner Interface:**</u>

1. **Registration:**
   The Gym Owner interface of the application provides a seamless experience for Gym owners to register and create their accounts securely. Upon registration, the gym owner

fills out a registration form with essential details. The registration request will be sent to the Admin for approval, and upon the approval of the Admin, A new gym will added to the database.

2. Login:

The admin interface begins with a straightforward login form, designed to provide secure access to administrative personnel responsible for managing the backend operations of the gym application.

3. Member Reports:

The admin interface allows administrators to view detailed reports on gym members. These reports include information such as membership duration, type of membership, and any kind of member-related information. This data helps administrators to understand member behavior and tailor the gym's offerings to better meet their needs.

4. Trainer Reports:

Administrators can also access comprehensive reports about the trainers. These reports provide insights into trainers' performance, their rating, and number of clients they manage, their experience, their personal information, and all the information related to trainers. This information is crucial for ensuring the quality of training provided and for making informed decisions about staff training and development. The admin should be able to generate reports using different attributes such as filters like experience and rating. The admin should also be able to see the record of trainers at the gyms (they have worked in the past and are registered on our platform).

5. Adding New Trainers:

Through the admin interface, administrators can add new trainers to the platform. This includes filling out forms with necessary details such as qualifications, experience, specialty areas, and personal information. This functionality simplifies the process of expanding the gym's staff and maintaining a high standard of training professionals.

6. Account Management:

Administrators are equipped with the capability to remove or delete accounts of both members and trainers. This feature is important for maintaining the integrity of the user base, such as deactivating the accounts of members who no longer use the gym services or enforcing compliance with gym policies.

Admin Interface:

1**. Login:**

This feature includes a simple login form where administrators enter their username and password. The system verifies these credentials against the database to grant access. It ensures that sensitive management functions remain secure from unauthorized access.

2. **Performance of Different Gyms:**
This functionality provides comprehensive reports detailing the performance metrics of different gyms. Metrics might include membership growth, financial performance, class attendance rates, and customer satisfaction. These reports help administrators identify high-performing gyms and those that may require additional support or intervention.

3. **Approve Gym Registration Requests**
This feature allows administrators to review registration requests from prospective gym locations. The admin can examine submitted details such as ownership information, facility specifications, current active members, and business plans. Approval of these requests enables the new gym to be officially recognized and integrated into the system, allowing it to operate under the brand's umbrella.

4. **Revoke the Memberships of Existing Gyms:**
This critical functionality provides administrators with the power to deactivate or remove gym locations from the network. This might be necessary due to reasons such as non-compliance with franchise standards, legal issues, or continuous poor performance. Revocation is handled carefully, with provisions for notifying the affected gym, handling transitions for existing members, and ensuring data integrity in the system.

The admin interface is designed to provide the gym's administrative staff with powerful tools to manage and oversee the entire operation effectively, ensuring both the quality of service provided and the satisfaction of gym members and trainers.

Reports Required:
The following reports are must-have reports.
1. Details of members of one specific gym that get training from 1 specific trainer.
2. Details of members from one specific gym that follow a specific diet plan.
3. Details of members across all gyms of a specific trainer that follow a specific diet plan.
4. Count of members who will be using specific machines on a given day in a specific gym.
5. List of Diet plans that have less than 500 calorie meals as breakfast.
6. List of diet plans in which total carbohydrate intake is less than 300 grams.
7. List of workout plans that don't require using a specific machine.
8. List of diet plans which doesn't have peanuts as allergens.
9. New membership data in last 3 months (Gym Owner).
10. Comparison of total members in multiple gyms, in the past 6 months.

You need to create 10 additional similar reports.

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Important Instruction:
All the tables should have adequate data to display the reports properly. The user table should have should have least 50 values, and every table should have a minimum of 20-30 values (Insert more values if required). The database should be in normalized form, and normalize the data as much as possible.

You should make sure that all functions listed in this document can be tested using proper interfaces. The project should also have a search option to search different kinds of records on different criteria.

What to submit
Submit your code and SQL queries for this project, a web application programmed in C# using Visual Studio 2019 and SQL Server. A document highlighting the design in terms of relationships/associations between different entities like ERD, Schema Diagram, and Mappings of the relationships must be submitted.