Lab Project: Database Development

Objective:

Enable the student to design and develop a database. In this project, the student is required to show their abilities of:

- Analyzing the System Requirement
- Represent the requirement into logical design using Entity Relationship (ER) or/and Enhanced Entity Relationship (EER) model
- Mapping the designed model into relational schemas
- Transform the relational schemas into normalized tables
- Writing SQL statements to creates the tables including all applied integrity constraints
- Writing SQL statements to populate the initial records of each table
- Front End Development of Forms/ Reports using PHP & Oracle database

1. Introduction

FIT-ME APPLICATION

In these modern days when people all over the world have become so much concerned about their health and diet, it is obvious that they continually seek out for a Workout/Gym platform.

This FIT-ME management system is an easy way to use gym and health membership system. It can help to keep the records of registered members, guidance which exercise and muscle groups to work out together, how much weight loss is required, their diet plans, logs of calories, daily targets to achieve. So, keeping in mind the main features of FIT-ME are guidance to their members about the

- Health and fitness checklist
- Weekly/Monthly Diet plan
- Daily Exercise chart
- Weight gain/loss plans
- Nutrient/Calories intake logs
- and many more

FIT-ME should be designed to facilitate a workout application to automate its 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 FIT-ME is to provide a system which handles the information of the members using the application and maintaining their health care.

2. Case Study

Due to Covid-19 and closure of indoor gyms, an owner of a Gym wants to make an application for his institute, so that members can access all fitness information and guidance related to workout at home. His objective is to provide his registered members the functionality to manage schedules, memberships, and other facilities.

To use FIT-ME, members information needs to be stored in the database. After initial registration, members are allowed to set a workout plan. The member can either create a plan of their own, or follow one already made (by another user, or by trained staff). While creating/viewing the plan, the member will be able to see what muscle groups need to be worked out, which exercise will work on the muscle group chosen, and even which equipment is required for a specific exercise. This plan will dictate what exercises the member needs to practice, and how frequently. Moreover, the plan also has details on the quantities of nutritional intake the member is allowed for optimal weight control/loss. Based on the plan chosen, there will be daily targets set for the user, notifying them of the exact exercises they need to do, in what order and for how long they need to work out and exactly what nutritional intake they are allowed. The members will then log their progress daily, mentioning to what degree they were able to meet the daily target. This log will allow the members progress to be tracked, allowing detailed reports, such as BMI change over time, muscle gain over time, weight loss over time, etc.

3. Deliverables

ERD:

The entity-relationship (ER) data model allows us to describe the data involved in a real-world enterprise in terms of ENTITIES and their relationships and is widely used to develop an initial database design.

Relational Schema:

The relational schema allows us to map the aforementioned ERD to the database design.

Database:

You are required to design a database that meets the users needs and implement this using Oracle in .sql file.

Website:

A fully functional app requires an interface for users to interact with. Create a web

interface using HTML, and use PHP to connect this interface with your database.

Forms:

- Registration form for new members
- Log form filled by member on daily basis that records the degree of target completion (exercises done, nutritional intake, etc).
- Workout plan creating form, which will require information such as BMI, age, targeted muscle groups, workout time, workout days, etc.

Reports:

- Generate reports for diet plan based on daily/weekly/monthly target
- Generate report for exercise, exercise type based on fitness goal
    - Goals can be getting fitter, gain muscle or lose weight
- Create a personalize plan from the current fitness level to the target fitness based on gender, age, BMI, and other requirements.
- There should be search Button also to search daily/weekly diet plan, exercise type and other purpose.

Project Report:

Contain all flow of your project in details and must contain:

- Contain your ERD
- Table description
- Schema diagram
- Screenshot of the interface including forms and reports with description

4. Evaluation Metric

Project Functionality	Deliverables	Marks (Total 100+10)
SQL	ERD	10
	Table description	5
	Schema diagram	5
	DML+DDL	15
	Report SQL	15
HTML Interface	Index page (where all forms are reports can be accessed)	5
	Forms	15
	Reports	15
Query Optimization	All SQL queries must be following query optimization standards	5
Problem Comprehension	Degree of problem comprehension, and mapping to solution	5
PL-SQL	Use of PL-SQL (triggers, procedures, etc)	5
Bonus	Any extra effort of use (Bootstrap, form validation, etc.)	10

Brief overview of the technology:

Front end: HTML (optional CSS, JavaScript, Bootstrap)

1. HTML: HTML is used to create and save web document. E.g., Notepad/Notepad++.
2. CSS: Create attractive Layout. (optional)
3. Javascript: Used for dynamic interactions with user (optional)

Back end: PHP, SQLPlus

1. PHP: Hypertext Preprocessor (PHP) is a technology that allows software developers to create dynamically generated web pages in HTML or other document types, as per client request.
2. SQLPlus: SQLPlus is a database, widely used for accessing querying, updating, and managing data in databases.