Unit:
Databases

Assignment title:
Fitness4All

Spring 2020

Important notes

- Please refer to the Assignment Presentation Requirements for advice on how to set out your assignment. These can be found on the NCC Education VLE. Click on Policies and Advice in the left-hand menu and look under the Advice section.
- You must read the NCC Education documents 'What is Academic Misconduct? Guidance for Candidates' and 'Avoiding Plagiarism and Collusion: Guidance for Candidates' and ensure that you acknowledge all the sources that you use in your work. These documents are available on *VLE*. Click on Policies and Advice in the left-hand menu and look under the Policies section.
- You **must** complete the **'Statement and Confirmation of Own Work'**. The form is available on *Campus*. Click on Policies and Advice in the left-hand menu and look under the Policies section.
- Please make a note of the recommended word count. You could lose marks if you write 10% more or less than this.
- You must submit a paper copy and digital copy (on disk or similarly acceptable medium). Media containing viruses, or media that cannot be run directly, will result in a fail grade being awarded for this assessment.
- All electronic media will be checked for plagiarism.

Introduction

This assignment contains THREE (3) parts: design, data and queries, and an assessment. All parts of the assignment relate to the ***Fitness4All*** scenario below.

Fitness4All

Background and Requirements

Fitness4All is a fast expanding gym company that now has several branches throughout England, with plans to open up another 12 branches over the next two years.

To date, the company has used a paper-based system to store details of its members, staff and fitness classes. Currently, when members attend the gym they have to sign in when they attend the gym.

Due to ambitious expansion plans senior management have appointed you to design and implement a database system that will hold details of members including attendance, staff and fitness classes.

When a member joins the gym, they have to provide a range of personal details. They also have to specify what their main fitness goal is. Members can choose from a range of membership types that provide them with access to just their local gym or they can choose a membership which gives them access to all gyms within the group. Additionally, there is a peak and off-peak membership type. Peak members can attend the gym at any time of the day or night, whereas off-peak members can only attend between the hours of 9am-3pm and 8pm – 6am.

With the new system, members will be provided with a membership card – similar to a credit or debit card that has a chip embedded in to it. When they attend the gym they will have to place their membership card on a chip reader which allows them access into the gym, and repeat the process when they leave the gym. This will record the date and time of each member when they arrived and when they left the gym, this will help management identify at what times the gym is busiest and quietest.

When members sign up to the gym they have to set-up a direct-debit and payments are taken on the month anniversary of their joining date. If a member misses a payment their subscription is temporarily suspended until the payment is received (which may be made by card payment).

Each gym runs their own timetable of fitness classes which is run by a member of staff from that gym. Members must book in advance to attend the class. Classes are free as they form part of the monthly membership cost.

With the current manual record keeping process, it has been noted that there are data inconsistencies, such as members not signing in, and loss of data integrity as the current system has evolved. This, along with growth, has resulted in a situation where Fitness4All require a relational database system to store, process and report on the gym's data.

Samples of the information stored can be found below:

Branch Details

Branch	Chelmsford
Address	Millsford Retail Park, Abbingdon Road, Chelmsford, CH3 8YT
Email	chelmsford@fitness4all.co.uk
Telephone No	01123221123

Branch	Rotherham
Address	Yeovil Industrial Estate, Torquay Road, Rotherham, RY12 9FT
Email	rotherham@fitness4all.co.uk
Telephone No	01475212541

Branch	Braintree
Address	WAG Industrial Park, Guilded Parkway, Braintree, BR1 8UY
Email	braintree@fitness4all.co.uk
Telephone No	05123621658

Membership Types

1 Branch:Off-Peak £16 per month
1 Branch:Peak £26 per month
All Branches: Off-Peak £22 per month
All branches: Peak £31 per month

Classes

Class Name	Boxercise
Instructor	Ifzhal Ahmed
Gym	Chelmsford
Date	24 November 2019
Start Time	08:00

Class Name	Yoga
Instructor	Tasmin Lewin
Gym	Braintree
Date	25 November 2019
Start Time	18:00

Class Name	Spinning
Instructor	Tasmin Lewin
Gym	Braintree
Date	24 November 2019
Start Time	08:00

Class Name	Boxercise
Instructor	Louise Bedford
Gym	Rotherham
Date	26 November 2019
Start Time	14:00

Staff

Staff Name	Ifzhal Ahmed
Employed Branch	Chelmsford

Staff Name	Tasmin Lewin
Employed Branch	Braintree

Staff Name	Matthew Lewis
Employed Branch	Rotherham

Staff Name	Vince Cooper
Employed Branch	Rotherham

Staff Name	Louise Bedford
Employed Branch	Rotherham

Staff Name	Marc Mingham
Employed Branch	Chelmsford

Members

Personal Details: Harry Gilbert, 12 Skipton Way, Rotherham, RY12 1WQ, 12/04/1974**, Membership Details:** Rotherham branch**, Joined:** 12/09/2019**, Goal:** Lose weight**, Status:** Active**, Membership Type:** 1 Branch Peak

Personal Details: Laurie Brown, 122 Norden Street, Rotherham, RY8 8YA, 22/12/1994, **Membership Details:** Rotherham branch, **Joined:** 19/09/2019, **Goal:** Build Muscle, **Status:** Active, **Membership Type:** 1 Branch Off-Peak

Personal Details: Tom Barclay, 88a Scarborough Avenue, Rotherham, RY2 8AH, 22/11/1999
Membership Details: Rotherham branch, **Joined:** 29/09/2019, **Goal:** Build Muscle, **Status:** Suspended, **Membership Type:** All branches Peak

Personal Details: Louise Gibbon, 167 London Road, Braintree, BR12 5FD, 1/04/1984 **Membership Details:** Braintree branch, **Joined:** 22/10/2019, **Goal:** Build Muscle, **Status:** Active, **Membership Type:** 1 Branch Peak

Personal Details: Maurice McPhee, 3 Granby Street, Braintree, BR2 7LP, 6/12/1998 **Membership Details:** Braintree branch, **Joined:** 22/10/2019, **Goal:** Lose weight, **Status:** Active, **Membership Type:** All branches Peak

Personal Details: Yasmin Gee, 881 Bodmin Road, Braintree, BR18 1FP, 26/08/1993 **Membership Details:** Braintree branch, **Joined:** 29/10/2019, **Goal:** Build Muscle, **Status:** Suspended, **Membership Type:** 1 Branch Peak

Personal Details: Amanda Stroud, 17 Manchester Street, Chelmsford, CH12 1RD, 14/07/1987
Membership Details: Chelmsford branch, **Joined:** 1/10/2019, **Goal:** Increase stamina, **Status:** Active, **Membership Type:** 1 Branch Peak

Personal Details: George Nuttall, 89 Lancashire Way, Chelmsford, CH5 9AG, 12/10/2000 **Membership Details:** Chelmsford branch, **Joined:** 4/9/2019, **Goal:** Lose weight, **Status:** Active, **Membership Type:** All branches Peak

Personal Details: Michael Parry, 54a Mill Terrace, Chelmsford, CH3 9UP, 2/3/1999 **Membership Details:** Chelmsford branch, **Joined:** 1/8/2019, **Goal:** Increase stamina, **Status:** Active, **Membership Type:** 1 Branch Off-Peak

Please note: The data shown in the assignment is not necessarily normalised and it is the candidate's task to organise the data in the most optimal way possible. For example, the records shown above will not necessarily map directly to database tables; there may be repeating data; not all data is atomic and it may be that not all unique identifiers are present. The candidate is expected to use these tables as a starting point for their own normalisation and optimisation of the data. Assumptions may be made and must be made explicit.

Please note also that all SQL scripts should be shown along with their results

Task 1 – Design (40 Marks)

a) Produce an entity relationship diagram for the proposed database system for *Fitness4All*. This should be a fully normalised model to 3rd normal form (20 Marks)
b) Discuss how normalisation of each of the samples of data in the scenario contributed to your finished ER diagram. (10 Marks)
c) Produce a data dictionary for the entity relationship diagram showing all attributes, with data types and identifying primary and foreign keys and any additional information relating to attributes that you may have identified from the scenario (10 Marks)

Task 2 – Data Entry and Data Manipulation (45 Marks)

1. Create all the normalised tables in SQL. Show your SQL scripts and the finished tables (10 Marks)
2. Enter all data on all Branches (1 Mark)
3. Enter all data on Members (1 Mark)
4. Enter the Membership Type data (1 Mark)
5. Enter the Instructor data (1 Mark)
6. Enter the Class data (1 Mark)
7. Create a direct debit payment for Maurice McPhee for the appropriate amount determined by his membership type (2 Marks)
8. Write a query that selects all of the data of members from the Surrey branch grouped by fitness objective (4 Marks)
9. Write a query that returns a list of all the staff currently employed at all gym branches grouped by branch name (3 Marks)
10. Write a query that returns the name, email address, join date and branch name of all members that currently have a 1 branch – off peak membership type (4 Marks)
11. Write a query that returns all the Boxercise classes that have been organised in all branches and include the branch name, instructor, time and date of the class. (3 Marks)
12. Write a query that selects all the classes that instructor Tasmin Lewin is teaching in date order (3 Marks)
13. Update the phone number for the Braintree branch to 01512362165 (1 Mark)
14. Create a booking for Amanda Stroud and Michael Parry for the Boxercise class at the Chelmsford branch (2 Marks)
15. Member, Tom Barclay makes a card payment to bring his account up-to-date. Create a payment record for the appropriate amount for his membership type. (2 Marks)
16. Update Tom Barclay's membership status to 'Active' (1 mark)
17. Update the fitness objective for the member Tom Barclay to 'Tone-up' (2 Marks)
18. Delete the instructor Vince Cooper (1 Mark)
19. Delete the member Louise Gibbon and their payments (2 Marks)

Task 3 – Assessment (15 Marks)

Provide an assessment of how the work you have done has met the requirements of *Fitness4All*

Your discussion should include:

- Your understanding of the requirements explaining any assumptions made (5 Marks)
- Initial design to meet the requirements including your design decisions and justifications (5 Marks)
- How the requirements have been met (5 Marks)

Submission guidelines

- Your submission should be in the form of a single word-processed document that includes any necessary diagrams.
- The word count for the document is **1250 words** (excluding text in any diagrams). You should explain any assumptions you have made.
- A digital version must be submitted on a CD, USB flash drive or other similarly acceptable medium, **along with a copy of the developed database**.

Candidate checklist

Please use the following checklist to ensure that your work is ready for submission.

Have you read the NCC Education documents 'What is Academic Misconduct? Guidance for Candidates' and 'Avoiding Plagiarism and Collusion: Guidance for Candidates' and ensured that you have acknowledged all the sources that you have used in your work?	❑
Have you completed the 'Statement and Confirmation of Own Work' form and attached it to your assignment? **You must do this.**	❑
Have you ensured that your work has not gone over or under the recommended word count by more than 10%?	❑
Have you ensured that your work does not contain viruses and can be run directly?	❑