

STW220CT – Data and Information Retrieval

Starter Assignment

Total Marks: 80

Deadline: 26-May-2021 6:00PM

Scenario

Background on the firm and requirements.

The Retro Club is a center that offers players access to a large collection of retro computer games and consoles from the 1980's to the modern day. The club started with one large floor and has recently expanded to a second floor for over 18's only and is based on the outskirts of London.

Customers can be either members or pay a single fee for a free play session. This allows access to all the machines on a floor with no further costs. Sessions are held each weekday evening 6pm-9pm and Saturdays and Sundays 11am-6pm. Most sessions are standard free play sessions however the club does hold 'special' sessions for example competitions on a weekly basis. Examples of sessions and fees can be seen in **Table 1**. Standard members pay a one-off membership fee of £10 which then gives them a 10% discount on each session price or premium members pay a one-off fee of £165 which allows free play for one year.

The club employs five staff members on a rota and each session has two or three staff members assigned, each fulfilling a single role such as working on the counter or in the cafe. An example of this information can be seen in **Table 2**.

Customers can call and book onto sessions or can just turn up and hope that there is space available. Details of customer bookings are recorded on an attendance sheet held at the front counter. When a pre-booked customer arrives, the staff member on the counter will find their name on the list and tick them off as attending. They will charge the customer the appropriate fee depending on if they are a member or not. An example of this list can be seen in **Table 3**.

Each retro machine has a single game e.g. PacMan, Space Invaders or Phoenix however there are also consoles which play many games. There are different versions of games depending on the console. Details of the machines, game, date and floor can be found in **Table 4**. There is an additional list of games by console in **Table 5**. Consoles do not belong to any floor – the staff move them between floors depending on the needs of any session. The club currently has three PS1's; two PS2's; three PS4's; two Nintendo Switches and four Xbox 360's. Currently the owner keeps all this information in a single a4 notebook. The owner likes to keep a record of which consoles are being allocated to sessions. An example of this can be seen in **Table 6**.

Table 7 shows a sample of customer data currently held.

The club is expanding rapidly, and the owner would like a database system on which they store and manage the club information.

Details of the data for these activities are shown in the example data in this assignment.

Example Data:

1. Sessions and fees

Session Number	Session Day	Session Start Time	Session End Time	Session Type	Floor	Price
1	Sunday	11am	6pm	Freeplay	1	£10
2	Sunday	11am	6pm	Freeplay	2	£5
3	Saturday	11am	6pm	Freeplay	1	£10
4	Monday	6pm	9pm	Special	2	£5

2. Session Staff Rota

Staff Name	Session	Role
Gemma Hoyle	1	Cafe
Sally Riley	1	Maintenance
James Howard	1	Counter
Kelsie Brookes	2	Counter
Jabbed Merza	2	Maintenance

3. Booking List

Session Number	Customer Name	Date	Member y/n	Fee	Pre-paid y/n
1	Martin Abed	14/05/2017	Y	n/a	n/a
1	Jessica Jones	14/05/2017	N	£10	N
1	Kylie Mason	14/05/2017	Y	£9.00	Y
1	Sarah Shaw	21/05/2017	N	£10	N
2	CJ Marley	14/05/2017	Y	£4.50	N
4	CJ Marley	06/05/2017	Y	£4.50	Y

4. Arcade Machine Information

Machine Number	Game	Year	Floor
75	Phoenix	1980	1
23	Space Invader	1982	1
13	Poker	1996	2
45	Mario	1983	1

5. Consoles and Games

Name	PEGI	Console	Console Qty
Spiro	PG	PS1	3
Spiro	PG	PS2	2
Crash Bandicoot	PG	PS4	3
Crash Bandicoot	PG	PS2	2
Legend of Zelda	PG	Nintendo Switch	2
Halo 3	15	X Box 360	4

6. Session Consoles

Session Number	Date	Console	Qty
1	14/05/2017	PS1	2
2	14/05/2017	PS2	2

7. Customers

First Name	Surname	Address	Member Type	Membership Fee	Join Date	Date of Birth
Kylie	Mason	10 Smith St, Southwark	Standard	£10	01/02/2017	01/03/1999
Martin	Abed	20 Walker Way, Southwark	Premium	£165	25/03/2017	14/02/2002
Saleya	Hussain	Flat 1, Warner Way, Bromley	Premium	£165	30/01/2017	25/04/1999
CJ	Marley	35 Spencer St, Brent Cross	Standard	£10	05/02/2017	14/02/1970

Please Note: The data shown in the assignment is not necessarily normalized and it is the candidate's task to organize the data in the most optimal way possible. For example, the records shown above will not necessarily map directly to database tables. You are expected to use these tables as a starting point for normalization and optimization of the Retro Club data. Assumptions may be made and must be made explicit.

Please note also that all Structured Query Language (SQL) scripts should be shown along with their results.

Task 1 – Design (40 Marks)

- a) Produce an entity relationship model for the proposed database system for *the Retro Club*. This should be a fully normalized model to 3rd normal form **(20 Marks)**

Note:

- You can use any tools for creating ER Diagram e.g. visual paradigm, Microsoft Visio etc.

- b) Discuss how normalization of each of the samples of data in the scenario contributed to your finished ER diagram. **(10 Marks)**

Note:

- You can use MS-Excel for showing normalized table.

- c) Produce a data dictionary for the entity relationship model showing all attributes, with data types and identifying primary and foreign keys. **(10 Marks)**

Note:

- Data dictionary contains column name, datatypes, length, nullable, key

Task 2 – Data Entry and Data Manipulation (40 Marks)

- a) Create all the normalized tables in SQL. Show your SQL scripts and the finished tables **(5 marks)**
- b) Enter all data on all customers and member types **(1 mark)**
- c) Enter data on all machines and floors **(1 mark)**
- d) Enter data on the staff rota **(1 mark)**
- e) Enter games and console data **(1 mark)**
- f) Enter the session data **(1 mark)**
- g) Write a query that selects all customers booked on session 1 who have not yet paid **(5 marks)**
- h) Write a query that selects all machines on floor 2 by year in descending order **(4 marks)**
- i) Write a query that counts all the console games for the PS2 **(4 marks)**
- j) Write a query that selects all customers who have a premium membership in descending order of surname **(4 marks)**
- k) Write a query that selects all the staff working on session 1 on the counter **(5 marks)**
- l) Update the floor for Mario from floor 1 to floor 2 **(2 marks)**

- m) Update the start time for session 1 to 11.30 am **(2 marks)**
- n) Update the membership type from standard to premium for the customer 'Kylie Mason' **(2 marks)**
- o) Delete the machine Phoenix **(1 mark)**
- p) Delete Gemma Hoyle from the staff rota for session 1 **(1 mark)**

Evidence

No marks will be awarded for statements that have only been word-processed. You are required to run your SQL statements and to include each output immediately after its statement. You should have a brief description of the SQL statements and the outputs.