

PROJECT

Objective: Your team has been approached by a company that wants to create a website exactly similar to facebook/linkedin/Digg. Your task is to create a database that will support the business processes and functionalities of the website. I do not expect you to develop a database to capture all the functionality of the real life website (but have broad enough scope that requires you to include 5-10 important entities in your ERD). It is important that you clearly highlight the features that you will focus on and then ensure that the database that you develop is sufficient to implement these features.

If you have an idea for an innovative application/idea then you can create a database for such an application too. However, you need to ensure that you clearly convey what that application does, what information does it need to store and process (in a database) to make that application work.

NOTE: Please describe the features within your scope clearly and/or show screenshots from existing system (mock-up screens if it is a new system)

Project Stage 1

STEP 1: Project scope and planning: Your team should spend time to understand the business and the functionalities provided by the website that has been assigned to your team. Write a brief overview of the business scenario (describe the business, business processes and features and functionalities that you will consider in your project) and mission. You should describe the scenario and define the scope of the project, i.e., the goals that the business organization will achieve with the database system, who will be the users, the major business rules, and so on).

STEP 2: ERD: The second step is to draw an E-R diagram based on your requirement analysis (using the notation used in the book). Specify the entities, their attributes, and relationships among entities. Among the attributes of each entity, specify the primary keys. Name the relationships. Reflect your business rules by identifying the cardinality for each relationship.

STEP 3: Relational Schema: Map the ER to a relational schema. Include a list of tables to describe the table structures. Specify the primary key and foreign keys.

DELIVERABLE 1:

The deliverable document (**groupnumber_phase1.doc**) **should** contain:

- **Overview** of the business scenario
- You should also provide screenshots of the pages, forms, etc., of the website that shows the business functionalities that you intend to include in the scope of your database.
- **Mission** Statement and Objective (refer Figure 10.8 and Figure 10.9 in appendix)

- **ERD** (try to fit it on one page)
- **Data Dictionary** (refer Appendix)
 - o Description of Entities
 - o Description of Attributes
- **Relational Schema** (refer Appendix)

Project Stage 2 [Additional details may be provided later]

OBJECTIVE: Create physical tables for your database and write SQL queries for your business

Step 1: Create tables based on your relational schema, using DDL. Link related tables together with foreign key constraints.

Step 2: Make up data for your database. Use DML to insert data values into these tables. For each table, there should be at least 5 records (or as many as needed to test your queries). Make sure that you have enough variety in the data so that you can perform queries on it based on various search conditions. Make sure that all tables are created and linked appropriately, and that the data makes sense.

Step 3: Prepare at least 20 queries (e.g., you may have a mix of simple and complex queries, queries involving derived value, aggregate functions, etc.). We will use these queries later to access data from an online application.

We will be evaluating the query based on its interestingness, potential usefulness, correctness (SQL will get what the query is expected to do), and (to a certain extent, the complexity).

Submit you SQL script in a text/word file (in the appropriate folder on mycourses).

DELIVERABLE 2

Deliverable should include:

- 1) Properly commented SQL script for creating tables with data and integrity constraints.
- 2) Properly commented (i.e. mention the objective of each query) SQL script for executing sample queries.

You should include all these SQL statements in **one text file** (use your group number to name the file i.e., **groupnumber_phase2.txt**)

Project Stage 3 [Additional details may be provided later]

Develop basic (online) applications.

For the final phase, you need to show the result of the queries that you wrote in second phase by creating a dynamic webpage.

You will create a simple web site/pages that will connect with your mySQL database and show the results of the queries that you wrote as part of Stage 2.

I will post a tutorial in the tutorial section which has a template. You just need to change the SQL in that template to your SQL and make appropriate adjustment to the while loop. Let me know if you have any difficulty. I may go over this tutorial in class.

I am not looking for a fancy/professional/sophisticated website. It is enough to have a set of pages (or a page) that shows the query purpose and the result of running that query on your database. However, if you can and want to, feel free to use your creativity and web development knowledge (would not be graded on these extras, though).

It should not take more than couple of hours to do it once you have figured out how to connect to your database using the template provided. If you have questions, you can always contact me.

DELIVERABLE 3:

- 1) A zip file (groupnumber_phase3.zip) containing all the HTML and PHP files, along with a text file that (was created in Stage 2) contains all the SQL code that was used to create tables, insert data, and answer all queries**
 - 2) A powerpoint file (groupnumber_phase3.ppt) with following info:**
 - a. Overview of the business scenario - highlight the business processes and functionalities of the website for which you developed your database**
 - b. Mission Statement and Objective**
 - c. ERD**
 - d. very quick overview of Relational Schema**
 - e. Pick one or two most interesting and challenging queries from your project. Explain the purpose and how does the query work.**
 - f. Share your learning experience - highlight the issues and challenges faced during the project, how you resolved those challenges, lessons learnt, ideas to extend the project.**
- Only one member of the group needs to submit the files.
 - The four files (**groupnumber_phase1.doc; groupnumber_phase2.txt; groupnumber_phase3.zip; groupnumber_phase3.ppt**) should be submitted on mycourses using the project submission link.
 - Please use your group number as prefix in the files names.

Group grade will be given based on the performance on all deliverables as specified in different stages. Peer Evaluation will be used to adjust the grades of the individuals in a group (to avoid free riding by few group members).

APPENDIX

Mission statement

- ***Mission statement* for the database project defines major aims of database application.**
 - **Helps clarify purpose of the database project and provides clearer path towards the efficient and effective creation of required database system.**
 - **Those driving database project normally define the mission statement.**

'The purpose of the *DreamHome* database system is to maintain the data that is used and generated to support the property rentals business for our clients and property owners and to facilitate the cooperation and sharing of information between branches.'

Figure 10.8

Mission statement for the *DreamHome* database system.

Mission objectives

- **Once mission statement is defined, *mission objectives* are defined.**
 - **Each objective should identify a particular task that the database must support.**
 - **May be accompanied by some additional information that specifies the work to be done, the resources with which to do it, and the money to pay for it all.**

To maintain (enter, update, and delete) data on branches.
To maintain (enter, update, and delete) data on staff.
To maintain (enter, update, and delete) data on properties for rent.
To maintain (enter, update, and delete) data on property owners.
To maintain (enter, update, and delete) data on clients.
To maintain (enter, update, and delete) data on property viewings.
To maintain (enter, update, and delete) data on leases.
To maintain (enter, update, and delete) data on newspaper adverts.

To perform searches on branches.
To perform searches on staff.
To perform searches on properties for rent.
To perform searches on property owners.
To perform searches on clients.
To perform searches on property viewings.
To perform searches on leases.
To perform searches on newspaper adverts.

To track the status of property for rent.
To track the status of clients wishing to rent.
To track the status of leases.

To report on branches.
To report on staff.
To report on properties for rent.
To report on property owners.
To report on clients.
To report on property viewings.
To report on leases.
To report on newspaper adverts.

Figure 10.9

DATA DICTIONARY

Description of the Entities

Entity Name	Description	Aliases	Occurrence
Movie	Contains the information needed to identify a particular film held by the business	Film	Many movies can be rated by many members. One movie can be distributed on many videos.
Video	A subclass of the movie entity, it uniquely identifies the specific video of a movie	DVD	Video can be distributed under only one movie. Many videos can be rented by many members.
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...			
...			
Comments	An entity that holds remarks, observations, and notes made by the customer	Suggestions	Many comments can be maintained by one manager. One customer can leave many comments.

Description of the Attributes

Entity Name	Attributes	Description	Data Type	Nulls	Muli-valued	Derived	Default
Movie	movIdNum	Unique ID for each movie	small int	No	No	No	None
	movName	Name of movie	20 variable chars	No	No	No	None
						
						
Video	vidIdNum	Unique ID for each video	small int	No	No	No	None
	Status	Status of a video (r=rented n=not rented)	1 variable char	No	No	No	N
Member	username	Unique name for each member account	10 variable chars	No	No	No	None
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RELATIONAL SCHEMA

Member(userName, password, fName, lName, street, city, state, zipCode, accBalance)

Primary Key: username

Rating(movIdNum, username, rating)

Primary Key: movIdNum, username

Foreign Key: movIdNum References Movie(movIdNum)

Foreign Key: username References Member(username)

Favorites(favID, userName)

Primary key: favID

Foreign Key: userName References Member(userName)

Movie(movIDNum, movName, director, category)

Primary Key: movIDNum

Contains(FavID, movIDNum)

Primary Key: FavID, movIDNum

Foreign Key: FavID References Favorites(favID)

Foreign Key: movIDNum References Movie(movIDNum)

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(Note: This schema is just for sample purpose and does not include all the tables)