

Due Date – Tuesday December 12th at 11:55 pm via e-classroom

Project Overview

You are required to form pairs (2 students) to design a database for a client and create additional SQL queries to support the operations of the organization.

You must select from:

1. A Credit Union with five or more locations nationally
2. A medical lab with four locations nationally
3. A private secondary school with four locations nationally (one all-male and one all-female school on each island)

You are encouraged to research the operations of any one of these organizations then design and create a database to house their operational data. Once this is done you must proceed to providing the organization with a collection of SQL queries that are necessary to support their daily operations and routine needs. Some routine needs may include monthly, quarterly and annual reports. You must provide at least **25** such SQL queries for your chosen business.

Please remember that while you must follow the principles and procedures taught in previous classes to arrive at an appropriate database design, the majority of your marks (as seen in the following marking scheme) will be allocated to your collection of SQL code.

You must do your best to develop queries which are the most useful and relevant to your organization's operations. Since this is a final project you will be expected to develop queries with a mid to high level of complexity i.e. to be counted as a valid query it must include at least two (but in most cases more) of the following :

- | | |
|----------------------------|---------------------------------------|
| 1. Single-row functions | 6. Data manipulation code. |
| 2. Conditional expressions | 7. A set operator |
| 3. Group functions | 8. Creation of schema objects such as |
| 4. A sub-query | views etc. |
| 5. Table joins | |

E.g. you may have a query which performs a table join and uses a group function, a group by clause and a having clause.

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What you must submit:

1. An MS word document which gives:
 - a. A brief profile of your chosen organization – this must include a description of the business, a brief history and an overview of their operations
 - b. The specific needs of the organization as regards Information Systems
 - c. The organization's business rules from which you designed your database
 - d. An ER diagram for your final database
 - e. A copy of all your DDL and DML code used to create and populate your database
 - f. A copy of the code for all your SQL queries or DML statements with a full description of their purpose
2. An electronic copy of your solution code (Including DDL for database set-up, DML, and SQL queries)
3. A video demonstration (10 - 12 minutes) of your working project

Marking Scheme

- Business overview and requirements analysis – 8%
- Database Design and Creation (including ERDs and DDL code - including views) – **20%**
- All SQL code and documentation (including the problem the code solves) – **60%**
- Video Demonstration/Presentation/Critique – **12%**

Due Date

Your complete project (word document, all SQL code, and demo video) is to be uploaded to e-classroom by the deadline date of December 12th 2017 at 11:55 pm.

Video Demonstration/Presentation Format

Your video must be prepared as though you were doing a presentation in class so I expect a PowerPoint presentation summarizing the development process (found in greater detail in your report) as well as a brief demonstration of your database. Your demonstration should show no less than 10 of your queries but you are not required to demonstrate all 25. It is strongly recommended that you include the queries which are most relevant to the business' operations and best utilize/exhibit the knowledge you gained in the course. **Note:** both partners must contribute to the video demonstration as well as any classroom presentation.

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Timeline

While this project is available to you from very early in the semester I expect that many of you may not start in earnest before week 4 or 5. All the same I want to suggest the following milestones in order to help you stay on track and allow you enough time to seek help or get my intervention if/where necessary. This way we can all avoid any undue stress at the end of the semester.

While I will not be marking on a timeline I suggest that you aim for the following milestones:

- **September 27th** – Select your organization. Ideally you should choose a business you are relatively familiar with or can easily get information about.
- **October 11th** – Complete your database initial study. You should know the purpose of the business, the database, the scope of the design etc. E.g. if it is for a credit union will the database cover all the entities of the organization or will it be limited to the clients and their transactions.
- **October 25th** – Complete your database design. Complete your conceptual and logical model by first following the 8 steps outlined in the table in appendix a then creating your data dictionary.
- **November 1st** - Create your database and populate it with sample data.
- **November 15th** – Identify all your queries and document their *purpose* (This should clearly match back to organizational needs identified earlier in your initial study of the business)
- **November 29th** – Complete writing your queries
- **December 6th** – Finish editing your final document and making your video.
- **December 12th** – UPLOAD FINISHED PROJECT!

If you find that you are falling well behind please email me with the challenges you are facing and I will do my best to help you get back on track. Remember that you still have all your other assessments and class work to manage so if you try to do a little every week on your project chances are that you will have a great project and all your hair at the end of the semester 😊

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Available Technology

For your video demo I suggest screencast-o-matic which allows you to record up to 15 minutes for free on their website (<https://screencast-o-matic.com/home>). Finally, you all have access to the Google hangout feature as well as Skype which allow you to face-chat and screen share (very useful) so you can work on your code/document almost as though you were all in the same room... very useful for projects like this.

Additional Note:

I have attached an appendix which shows an excerpt from an ITEC270 final project specification document. This may help you to gather your thoughts and jog your memory on the process of designing a database...I know some of you may be rusty depending on how long ago you did that course. In this class of course you will be using an Oracle database but the process is much the same.

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To summarize, the phases you must incorporate in your design are:

1. Database initial study – here you are required to give a description of the company for which you are designing your database. Include any problems the company now experiences which must be solved by your database e.g. reports to be produced queries to be generated etc. Also clearly state the objective of the system you are to develop and the scope of your design e.g. how long it is expected to be a viable solution for the company.
2. Database design – Begin here by creating the conceptual model of your database by following the steps in the following table:

**TABLE
9.1****Developing the Conceptual Model Using ER Diagrams**

| STEP | ACTIVITY |
|------|--|
| 1 | Identify, analyze, and refine the business rules. |
| 2 | Identify the main entities, using the results of Step 1. |
| 3 | Define the relationships among the entities, using the results of Steps 1 and 2. |
| 4 | Define the attributes, primary keys, and foreign keys for each of the entities. |
| 5 | Normalize the entities. (Remember that entities are implemented as tables in an RDBMS.) |
| 6 | Complete the initial ER diagram. |
| 7 | Have the main end users verify the model in Step 6 against the data, information, and processing requirements. |
| 8 | Modify the ER diagram, using the results of Step 7. |

Finally convert your conceptual model into a logical model by essentially describing a data dictionary for your database i.e. for all your entities list its attributes and their characteristics such as data type & length, description, format, constraints, default value and referenced tables.

3. Implementation and loading – Create your database using MS Access by implementing your table structures and the constraints you identified in step 2. Finally load some sample data into your database.