Database Project Guidelines

Step	Task	Requirements	What to Deliver?	Teamwork Suggestions	Due Time
Step 1	Planning and System Analysis	1. Get contact Information of your teammate (email, phone number, etc. (any contact that you would like to share with your teammate)) 2. Decide with your teammate about a weekly schedule that you will be meeting/working on the project (e.g. every week Mon, 10 am to 12 am). Meetings can be off-line or online. Whatever works for you. 3. Decide with your teammate, who is going to implement the project on MySQL and who is going to implement it on MS SQL Server. 4. The MySQL expert installs WAMP on his/her computer and MS SQL Server expert installs MS SQL Server on his/her computer. 5. Read the project description and make sure you understand the problem. Let your instructor know if any part of the project is not clear to you. 6. The project description is not complete; you must complete it with more details. In fact, you must decide on the details that you require for your ER-Modeling. Moreover, your project description may miss the cardinality of relationships between entities. You must make realistic, practical, real-world assumptions for cardinalities and total/partial participations. For example, if your project is a university database, you must decide if in The University, one course is taught by only one instructor or several instructors. In this case, assume a realistic and real-world assumption. For example, if I were you, I would assume that every course is taught by only one instructor.	Use the Project Report Template (MS Word Doc file) provided to you and fill the items 1 to 6 of the **Project Report Template document** and submit it prior to the due time. Include screenshots of successfully installed WAMP and MS SQL Server. One screenshot of the interface of the DBMS by each teammate, a total of two screenshots, one from MySQL, one from MS SQL Server. **For submission:** One of the teammates submits to the group folder created for this step, the other verifies that the submission is correct and error-free	Both team members individually work on assumptions (point #6). They meet and compare their assumptions and discuss them. After discussion, one set of assumptions is concluded and selected as the final assumption. You can meet online or off-line to complete this step. Make sure all team members contribute to this step. The MySQL expert can explain the process of installation to the MS SQL Server expert and vice versa. This way both students learn about these two DBMSs.	**Fri., Jun. 4 at 11:59 p.m.**

Database Project Guidelines

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Step 2	Draw ER/EER diagram for your project	Your ER/EER diagram must show all 1. Entities (weak, strong) 2. Attributes (keys, derived, multivalued, composite) 3. Relationships (Identifying, N-ary, Recursive) 4. Cardinality (1:1, 1:M, M:N) 5. min, max cardinality, or total/partial participation in your project, you may or may not have weak entities or some types of attributes or relationships. The above requirements do not mean that you must include in your project at least 1 of the above modeling components. For example, if using a weak entity in your modeling is needed, you use a weak entity. Otherwise, it is not a requirement to have at least one weak entity in all projects.	**Update** the Project Report Template document provided to you and fill item 7 (EER Modeling Diagram). You can use a software to draw or use the shapes that I have included in the template document. Make sure you use Chen's Model or Crow's foot symbols for your drawing and make sure your drawing is neat and tidy. Submit updated Project Report Template document including step1.	Both team members individually come up with an EER Model before meeting and then they meet and compare their model and discuss on their models. After discussion, one model is concluded and selected as final model for drawing and submission.	**Fri. Jun. 11 at 11:59 p.m.**
Teamwork Check Point 1		If you feel your teamwork is not productive enough, it is better to resolve it as soon as possible. Inform your instructor of your concern. At this step, the instructor and students meet and all work together to find a solution. We hope implementing the solution will resolve the problem.		**Send an email to your instructor as soon as possible.**	

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Step 3	Map your ER/EER diagram to a Relational Schema	Your Relational Schema must include: • Name of Relations • All attributes in the relation • Primary keys • Foreign keys	Update the Project Report Template document provided to you and fill item 8.	Half of the relations is mapped by one member and the other half by the other. When you meet, each member verifies the work of the other teammate. You will merge your work and you submit your final relational schema.	**Fri., Jun. 25 at 11:59 p.m.**
	Normalize your Database	Show (by explanation) that all relations in your database are in 1NF, 2NF, 3NF and BCNF. If any relation is not in a normal form, you must decompose that relation to normalize it	Update Project Report Template document provided to you and fill item 9. Submit updated Project Report Template document including step1 and 2.	Half of relations are normalized (up to BCNF) by one and the other half by the other teammate. When you meet, each member verifies the work of the other teammate. You will merge your work and you submit your final normalization.	
Teamwork Check Point 2		If you think your teamwork is not going in the right direction, inform your instructor. At this point, if the instructor found that one teammate is not active and does not contribute enough to the project, the team is split up and each member works on an individual project. The student who contributed more continues the project and the other less contributing student is assigned a new project. Both students must fulfill all requirements of project just like other groups. (Moral Lesson: teamwork is better)		**Send an email to your instructor as soon as possible.**	

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Step 4	Create your tables using SQL DDL (Data Definition Language)	Each expert creates a database on its selected DBMS. It means that MySQL expert implements the project database tables (all) on MySQL and MS SQL Server expert implements it on MS SQL Server. Create your tables and Insert data into the tables by SQL commands. Most of the SQL statements for creating and dropping tables and inserting data to the tables for MySQL and SQL Server are the same. Just run your SQL statements on both DBMSs to learn if there are any differences between SQL of MySQL and SQL of MS SQL Server. If there is any statement that works on one DBMS and does not work on the other, put a comment in your scripts and explain that this feature works on, for example, MySQL but does not work on MS SQL Server, or vice versa.	Create 2 folders and each folder must contain 3 SQL script files. Name the folders as *MySQL Scripts*, and *MS SQL Scripts*. The *MySQL Script* folder contains scripts tested on MySQL and the *MS SQL Server Scripts* Folder contains scripts tested on MS SQL Server. 3 scripts are: 1. A Create Script that includes all SQL statements for creating all tables 2. A Drop Script that includes all SQL statements for dropping all tables 3. An Insert-into Script that includes all inserting into values to all tables. If something works on MySQL but it does not work on MS SQL Server, put comment(s) on top of the script file(s) for MySQL like '' 'This feature (mention what)' does not work on MS SQL Server" If something works on MS SQL Server but it does not work on MySQL, put comment(s) on top of the script file(s) for MS SQL Server like '' 'This feature (mention what)' does not work on MySQL" If there is no incompatibility for your entire code, just put comment on top of your MySQL script(s) like "the entire code works perfectly on MS SQL Server" and on top of the scripts for MS SQL Server "the entire code works perfectly on MySQL" Prior to submission, zip 2 folders (each containing 3 scripts) along with the UPDATED (if any) Project Report Template and submit the zipped file.	Half of the create, and half of the drop and half of insert-into SQL commands done by one and the other half by the other teammate. When you decide on who does what, note that a parent table and a child table must be done by one person. A parent table is the table that includes the primary key and a child table is the table that includes a foreign key. Each teammate must take a family 😊 (parent table plus its children tables) If one of you takes to create a parent table and the other takes the child of that parent table, the teammate who wants to create the child table will get an error message because the foreign key in the child table refers to a parent table that is going to be created by the other teammate. Then both of you must create a parent table and you may have a problem later when you want to merge the tables. When both finished your part, you can meet, and each member verifies the work of the other teammate. You will merge your work and each teammate runs the whole SQL code on their DBMS to be sure the SQL code works on both DBMSs. If something did not work on one of the DBMSs, write a comment in your script and explain what the difference is. You do not need to submit two versions of scripts for each of the two DBMSs. You submit one version of scripts but by commenting on them, you explain the differences that you found between two DBMSs.	**Fri., Jul. 9 at 11:59 p.m.**
	Insert some values into your database	Populate your table with some values. You do not need to spend time to collect real-world data, you can make data, **however**, the values that you enter to the tables must help you to test your SQL retrieval queries in the next step and your data must show the relationships and their cardinalities. For example, if there is 1:M cardinality ratio for a relationship, your data must show 1 primary key in one the parent table is referred by multiple foreign keys in the child table. This is method for testing your design. If you could not enter multiple foreign keys that refer to your primary key, it means you made a mistake somewhere in your design.			

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Step 5	Write SQL queries for your database	The main purpose of creating a database (organizing data) is to be able to retrieve data (information) efficiently. Write 20 retrieval SQL queries for your project. Queries must be practical and realistic for the project. Assume your project is a commercial DB project that a client is going to buy it. What are the queries that your client expects to see in your DB? (trivial SELECT queries such as "SELECT * FROM Projects" are not accepted. Or if there are multiple queries with slight differences, only one of them is accepted.) You must write at least 1 query from each of the following categories: 1. JOINs (Left, Right, Inner, Natural, Cross (Cartesian)) 2. Update query 3. Delete query 4. Aggregate functions (SUM, AVG, MIN, MAX, COUNT) 5. Nested queries 6. Using a view	Create a plain text file and include all your SQL queries, then submit it along with your finalized Project Report and previous steps. The report must include latest updated edition of **all steps** of the project. Do not use MS Word to save SQL queries, as it may change quotation marks. If a query does not work on any of the DBMSs (MySQL and MS SQL Server), first try to find a solution that works on both DBMSs but if you find a solution that is exclusive (works on one and definitely does not work on another) put a comment on top of your script file (the file that contains all queries) and explain what query and what feature does not work on what DBMS.	Each teammate comes up individually with 20 queries. Then the team meets, and they discuss to select only 20 queries out of a total of 40 queries which both teammates have suggested. Try to select applied, practical, complex queries. Filter your common or similar queries and non-practical or easy queries. Assume you really want to sell your DB, then decide what queries are needed in your commercial database.	**Fri., Jul. 23 at 11:59 p.m.**

Database Project Guidelines

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Step 6	Implement the frontend and backend of your web application	Write HTML/CSS/PHP to implement front-end (interface) and back-end for your application. Main work is on the back-end (PHP) and not on the Front-end (HTML/CSS) Pick one table from your database, you must implement a WebApp that you can: • Insert data entered by the web form into the table • Delete a record selected by the user in the web form from that table • Update a record selected by the user in the web form from that table • Display the result of a query with parameters that the user has entered (for example, display all students who were born between X data and Y date. The user enters (or select) X and Y date on the HTML page form)	Store all your HTML/CSS/PHP etc. in a folder and submit the zipped folder to the assigned folder for this step of the project.	In this step, every teammate works individually. Both teammates, no matter you are MS SQL expert or MySQL expert, individually installs WAMP on his/her computer and implements PHP for connecting to MySQL! The connection and working with MS SQL Server are a bit different and you are not expected to work on it.	**Fri., Jul. 30 at 11:59 p.m.**