IE Hacettepe
EMU415 Database Management Systems
2023-2024 Spring Term
Team Work Guideline and Assignment 1

Erdi Dasdemir
edademir@hacettepe.edu.tr, www.erdidasdemir.com
Industrial Engineering Department, Hacettepe University, Ankara, Turkey

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Team Work Guideline

EMU415 - Database Management Systems for the spring term of 2023-2024 includes several assignments and a project work that will allow you to apply the concepts we will learn in a practical manner. These activities will be completed in TEAMS.

Teams must consist of a minimum of 6 and a maximum of 8 students. If you have a valid reason to request a smaller or larger team composition, please reach out to me discuss your situation. It is important to note that once your teams are finalized, NO CHANGES will be permitted throughout the term.

If you are unable to find a team to join, or if your team has open positions, please post your situation in our SLACK channel. This will allow us to facilitate matches and resolve any team formation issues.

All assignments and project outputs that require computer-based tasks must utilize MySQL as the Database Management System. Furthermore, all project-related materials, including programming code, meeting minutes, and report documents, must be stored on GitHub in a private repository. Links to these GitHub repositories will be distributed once your teams have been established. Each team will be assigned a specific GitHub repository, which will serve as the central hub for managing and tracking your assignment and project work.

In the coming weeks, detailed instructions for subsequent assignments and project deliverable will be provided. Briefly, the assignments will involve practical tasks aimed at enhancing your hands-on skills in the subjects discussed during lectures. The team project will cover the entire database life cycle, from design through to implementation, incorporating elements of real-world relevance whenever possible.

Ethics rule: You are not allowed to copy your work from any available source or your classmates. When borrowing code or ideas, it's essential to explicitly reference the source with a direct link. Adapting good ideas for new purposes and crediting your sources is strongly encouraged. Failure to do so can lead to embarrassment. The EMU415 course promotes the use of artificial intelligence (AI) tools to enhance your productivity. However, there are specific rules to follow. First, it's crucial to rely on your human intelligence (HI) to evaluate the AI's outputs for accuracy. Providing the course instructor with AI-generated content that is incorrect is considered unethical. If you use AI for any part of your assignments or project, please make it clear by highlighting that section and including the AI prompt you used as a footnote. Use HI all time.

Assignment 1 - Team Initialization (Due Date: March 17, 2024, 23:59)

This assignment requires you to create a MySQL database for submitting your team's details and to carry out SQL exercises. Upon completion, you are to submit three distinct files through the designated submission on www.hadi.hacettepe.edu.tr. The required submissions include:

1. A DUMP file of your database, capturing all the content and structure of your submission.
2. A script file containing all executed SQL queries.
3. A concise, 1-page PDF report summarizing your findings and experiences.

Further instructions on how to generate these files are detailed in the subsequent tasks. Make sure that you maintain all SQL queries you executed during the assignment in a single script in MySQL Workbench. You will need to save and submit this script at the end.

Ensure that you retain your database on your computer. Upcoming assignments will expand upon the database structure and content developed in this assignment, necessitating its availability for future work.

1. Create Your MySQL Database

Your first task is to create a new database named "EMU415_xxxxx", where "xxxx" is your team name. Remember to set the character set to UTF8 to ensure compatibility with a wide range of characters.

2. Create Your Team Members Table

Create a table named "team_members" that will hold information about each team member. This table should include columns for member ID, first name, last name, student ID, email, birthdate, the year they joined EMU Hacettepe, a BRIEF biography, and the URL of their personal web sites or LinkedIn page(for those without a personal website). Carefully select suitable data types for each of these fields to ensure the integrity and usability of your data. Please make sure to utilize the specified column names in your table: member_id, first_name, last_name, student_id, email, birthdate, join_year, biography, website_url.

3. Insert Team Member Data

Enter the details of each team member into your table using SQL queries. Think carefully about the SQL INSERT statements you'll use to add this data.

4. Add Columns for Expected Graduation Year and Age Column

Add a new column, designated 'age', to your table to store the ages of your team members. Calculate the ages of your team members using their birthdate and the current date. (Hint: This requires a current date reference for calculation. You can refer to TIMESTAMPDIFF and CURRENT_DATE or CURDATE functions.)

Add a new column to your table, designated 'graduation_year', to store the expected graduation year for each of your team members. Calculate this year by assuming a standard study duration of five years to their year of enrollment at EMU Hacettepe.

5. Perform SQL Queries for Team Statistics

After entering all team members' data, run various SQL queries to derive interesting statistics about your team. Here are some examples:

- Find the total number of team members.
- List team members by age from oldest to youngest.
- Identify the range of expected graduation years within your team.
- Analyze the distribution of team members across different joining years. (Hint: A query to count the number of team members who joined EMU Hacettepe in each year.)

Include your SQL quarries and statistics in your PDF report.

6. Hash Identifier Generation

Construct a single SQL query to perform the following task:

- Count the total number of team members
- Find the earliest expected graduation year among team members
- Calculate the average age of your team members
- Concatenate the above metrics in the given order into a singular string, utilizing a dash ("-") for distinct separation between values. Subsequently, employ the Secure Hash Algorithm 1 (SHA1) algorithm to this concatenated string to create a unique identifier that effectively encapsulates these particular team statistics. For further details on the SHA1 algorithm, visit https://en.wikipedia.org/wiki/SHA-1.

Note: You are REQUIRED to use a single query to generate the identifier.

Include both your SQL query and the resulting identifier in your PDF report. Additionally, provide a brief explanation, spanning 2-3 sentences, on how cryptographic algorithms such as SHA1 are applied within the realm of database management.

7. Save your DUMP file

After creating and populating your database, proceed to generate a DUMP of the ENTIRE database. The dump file is a snapshot of your database at the time of export. In the Navigator pane located on the left side of your screen in MySQL workbench, confirm that your database is currently selected. If it appears unselected, navigate to the Schemas section, click on your database to activate it.

Move to the Administration menu adjacent to the Schemas tab, and choose the Data Export option. This action will launch the Data Export wizard. Within the Data Export screen, a list of schemas will be displayed. Mark the checkbox next to your database to opt for its export. Ensure the export encompasses the entire database by selecting all the elements (tables, etc.) you aim to include in the dump. Opt for the "Export to Self-Contained File" selection, ensure both the 'self-contained file only' and 'include create schema' options are enabled, and designate a file location for saving the dump file. The default file name will include the date, e.g. "Dump20240309", but you must alter it so that the name of your dump file begins with EMU415_team_xxx_hw1, e.g. "EMU415_team_xxx_hw1_Dump20240309". Submit the generated .sql dump file to the open assignment on www.hadi.hacettepe.edu.tr

If you encounter any errors while saving your DUMP file (this may happen due to version mismatches), immediately report your issue to our Slack Channel for assistance.

8. Save your SQL query file

Compile all the queries you've executed for the tasks mentioned above into a single SQL script within MySQL Workbench. To save this script, navigate to the File menu and select 'Save As'. Name the file as "EMU415_team_xxx_hw1_queries" (xxx will be replaced by your team name).

9. Preapre your PDF report

Compose a 1-page PDF report that includes your team's name, information about each team member (limited to first name, last name, and student ID), a professional photograph (akin to LinkedIn standards) for each team member, and your responses to tasks 5 and 6.

Note: While you are permitted to use any platform for document creation, I strongly encourage the use of Quarto. Generating your report with Quarto will award you an extra +10 bonus points on your assignment grade. This means that a grade of 80, for example, would be increased to 90 with the bonus. Assuming you did all tasks successfully and received the +10 bonus, your average might exceed 100. In this case, if your average assignment grade at the term's conclusion surpass 100, an extra 2 points will be awarded to each team member's overall grade. If you decide to use Quarto, ensure to submit both your .qmd file and the resultant PDF report.

10. Upload your DUMP, SQL and PDF files

Please upload both your database DUMP file, SQL query file and PDF report to the designated assignment submission on www.hadi.hacettepe.edu.tr.