IEEE ZAGAZIG Student Branch

IEEE COMPUTER SOCIETY ZAGAZIG STUDENT CHAPTER

@Backend : Phase1

Task 2

/DBMS-MySQL

/Feedback

$ Task_1_Feedback

/Resources

$ Watch from Chapter 4 till the end of this Course covering:

> **CH04:** Structured Query Language (SQL) & DDL

> **CH05:** Data Manipulation Language (DML)

> **CH06:** SQL Other Objects (Views & Indexes)

> **CH07: Normalization (1NF, 2NF, 3NF)**

$ Watch this video MySQL-Tutorial till 1:19:49:

$ Other Useful resources along this phase:

> Baraa Course

> Eng-Ramy ITI Course

> DR-Amr Internal DBs Course

$ you may need this:

> Markdown Tutorial

/TODO

$ Part A: The Normalization Challenge

The university administration has sent you a messy Excel sheet named Legacy_Data containing the following columns in a single table: Student_Grade_Report (Student_Name, Student_Phone, Student_Address, Course_Title, Instructor_Name, Instructor_Dept, Dept_Building, Grade)

The Issues:

1. ***Multi-valued:*** *The Student_Phone cell often contains multiple numbers.*
2. ***Partial Dependency:*** *Student_Address is mixed (City, Street, Zip) and repeats unnecessarily.*
3. ***Transitive Dependency:*** *Dept_Building depends on Instructor_Dept, not on the Student or the Course.*

Your Task: *Create a file named normalization.md (or .txt) and explain how you would convert this single table into **3rd Normal Form (3NF) (Make your explanation like you are explaining to a student who doesn't know anything about normalization)**.*

- ***Step 1 (1NF):*** *Show how you remove the multi-valued phone numbers.*
- ***Step 2 (2NF):*** *Show how you remove partial dependencies (ensure data depends on the Primary Key).*
- ***Step 3 (3NF):*** *Show how you remove transitive dependencies (ensure non-key columns don't depend on other non-key columns).*

$ *Part B: SQL Practice Problems (LeetCode)*

Solve the following problems on LeetCode to practice what you studied. Create a file named ***Task_2_Solutions.sql*** *and paste your SQL code for each problem there.*

> Recyclable and Low Fat Products

> Big Countries

> Find Customer Referee

$ *Part C: Research Questions*

Answer the following questions in a file named ***research.md****.*

1. *What is the difference between a DBMS and an RDBMS?*
2. *Based on Chapter 04 and 05, what is the difference between DDL (Data Definition Language) and DML (Data Manipulation Language)? Give one example command for each.*
3. *In your own words, why is Normalization important for a large system like a university database?*

/Notes

> Know that the first course is only a theoretical foundation and now we learn a real DBMS (MySQL or Postgres) and what we have created in task1 we will use in an upcoming task.

> treat everything that requires an explanation like you

are explaining to another student who doesn't know anything about this thing (the explanation you create will be helpful for you in the simulation interview we are managing to do).

/Submission Guidelines

> first of all I want you to create a repository on github call it IEEE-ZSB-Backend-26 and you should put all of your work on the upcoming tasks on it

> Inside this repository create a folder named MySQL and put all of the files that required in the task like this

```
IEEE-ZSB-Backend-26\
    MySQL\
        Task_1\
            normalization.md
            Task_2_Solutions.sql
            research.md
    HTML\
        . . .
```

/How-To-Submit

$ After you finish all of that, push your files on the repo as explained.

$ Submit the GitHub repository link on the task chat on **Discord.**

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/Deadline

$ Monday, February 16 at **11:59 PM**

Wish you the best.❤️