SE 307 DATABASE MANAGEMENT SYSTEMS

TERM PROJECT – 2023/24 Fall

***** Please Read Carefully *****

1. INTRODUCTION

In this project you are expected to design a **database** and develop a **database application** for the **Graduate Thesis System (GTS)**.

In the first part of your project, you are expected to design the **relational database** and submit your design document by **Sunday 3rd December 2023 23:59**. This will be graded as your midterm exam and its weight will be 50%.

In the second part, you are expected to develop an **application** that makes use of your database design. You'll submit a complete project document by **Sunday 7th January 2024 23:59**. This will be graded as your final exam and its weight will be 50%. Please refer to the following sections for more detailed information.

2. DATA REQUIREMENTS

A **database** for GTS will be designed for storing data about each and every graduate thesis completed. The following are the data requirements (business rules) that must strictly be satisfied:

1. Each thesis has the following mandatory attributes: thesis no (numeric, whole number, 7 digits max), title (500 chars max), abstract (5000 chars max), author, year, type (one of these: Master, Doctorate, Specialization in Medicine, and Proficiency in Art), university, institute, number of pages, language of the thesis text, and submission date,
2. A person can be author of more than one theses (for example, a person can prepare a Master thesis, later s/he can prepare a Doctorate thesis),
3. A thesis can have only one author (unlike scientific papers, there is no co-authorship in theses),
4. A thesis must have at least one supervisor,
5. A thesis can have a co-supervisor, but is optional.
6. A person can supervise many theses,
7. A university can have many institutes. For example, Marmara University has lots of institutes such as Institute of Pure and Applied Sciences, Institute of Social Sciences, and so on.
8. An institute can belong only to one university,
9. A thesis must be associated with one or more subject topics (users select from a list of subject topics; they do not enter subject topics freely),
10. A thesis can be associated with zero or more keywords (unlike subject topics, users enter keywords freely),
11. A thesis can be written in only one of several languages like Turkish, English, French, etc.

3. APPLICATION DEVELOPMENT

A **database application** will be developed for GTS. The following are the rules regarding the expected functionality of the application and other related issues.

1. Develop a web or desktop or mobile application in any programming language and/or platform you like.
2. There must be **user interfaces for entering/updating data in parent tables** other than the thesis table. For example, user can add/change/delete universities, new institutes, etc.
3. There must **be a thesis submission user interface for authors**, where authors fill in the required fields of the theses they want to submit.
4. There must be **a detailed thesis search user interface** where user can query the thesis database by entering any combination of thesis data. For example, user can search the database for a specific author, or for specific keywords, or for specific years, or combinations of all fields, etc. Theses found after the search must be listed in an ordered fashion, and user can select a thesis to see its all details in a carefully designed screen. You may wish to look at YÖK thesis database portal for a highly useful search facility (https://tez.yok.gov.tr/UlusalTezMerkezi/).

4. DELIVERABLES

4.1. Design Document (50%) – Deadline: Sunday 3rd December 2023 23:59

You are required to design the thesis database according to business rules given above, and then create and deliver a **detailed design document** in which you explain the design of the database.

The following must appear in your document:

1. **Draw** the ER diagram of your design in Crow's Foot notation and put it into your report.
2. **Create** the tables, relationships, and necessary indexes in MS SQL Server (make logical and reasonable assumptions about data types and max lengths of attributes, otherwise you will have grade reduction). You **can** use other Relational DBMSs such as PostgreSQL, MySQL, Oracle, DB2 and so on. You **cannot** use file-based databases such as MS Access, SQLite, and so on. You **cannot** use NoSQL databases such as MongoDb, Firebase, and so on. If in doubt, please ask for clarification.
3. **Draw** the relational database diagram (**fit into single page**) and put it into your report.
4. **Populate** your database with meaningful sample data (at least 5 records in each table).
5. **Put** the SQL commands into your report.
   a. Create commands you have used to create entities, relationships, and indexes.
   b. Insert Into commands you have used to populate the database.

4.2. Design and Implementation Document (50%) – Deadline: Sunday 7th January 2024 23:59

In this second submission, you are expected to expand your first document by including information about your application's **design and implementation details**, along with screenshots from the user interfaces. In the report, I would like to see how you access the database, what type of difficulties you encounter, what are the advantages of the techniques

you use to manipulate the data, etc. Add your application **source code** into the **appendix section** of your project report.

Self-reflection: Additionally, I would like to see a section in the document where you provide a self-reflection on your journey with SE 307 course and the project. Tell me what you learned, what went well, what did not go well, what you can take from this class to use in another class or in your future work, what could be differently in terms of your study and my delivery of the database subjects. Please be honest and open. This part will not be marked but it will be an opportunity for me to improve the course for future.

5. OVERALL APPEARANCE AND QUALITY

Ten (10) marks of each submission will be awarded for the professional appearance and presentation of the report including fonts, headings, layout, illustrations, appropriate formal writing style, spelling, and grammar. The document should be presented primarily in A4 portrait format (use landscape if a graph, table, or diagram merits it) and should have a cover page with full list of all student names and IDs), table of contents and page numbers at the bottom right corner of each page.

6. SUBMISSIONS

You must submit your documents to the respective submission points on Blackboard course page. Submissions by email will not be accepted. Late submissions will not be accepted. Submission points on Blackboard will automatically be closed by the deadlines. Submissions to incorrect submission points will not be accepted and graded.

Please do all work by yourself, please do not prepare something copy-pasted from some other resources. Never present the work of your friends as if it is your own work! Projects that obviously look prepared this way will not be evaluated and graded. Use of AI tools is strictly forbidden. If I feel that some work is generated by an AI tool such as ChatGPT, it will be regarded as violation of academic integrity and will get ZERO mark.

Projects should normally be done in groups of four (4) members. If you want to do the project individually or in groups of 2 or 3 members, it is OK. You cannot change (add/remove) group members after the submission of first part. You must continue with the same group for the final submission. Otherwise, all previous group members will get ZERO mark for the final submission.