Assignment: The entity-relationship data model
COMPSCI 2DB3: Databases–Winter 2024

Deadline: February 2, 2024

Department of Computing and Software
McMaster University

Please read the *Course Outline* for the general policies related to assignments.

Plagiarism is a *serious academic offense* and will be handled accordingly.
All suspicions will be reported to the *Office of Academic Integrity*
(in accordance with the Academic Integrity Policy).

This assignment is an *individual* assignment: do not submit work of others. All parts of your submission *must* be your own work and be based on your own ideas and conclusions. Only *discuss or share* any parts of your submissions with your TA or instructor. You are *responsible for protecting* your work: you are strongly advised to password-protect and lock your electronic devices (e.g., laptop) and to not share your logins with partners or friends!

If you *submit* work, then you are certifying that you are aware of the *Plagiarism and Academic Dishonesty* policy of this course outlined in this section, that you are aware of the Academic Integrity Policy, and that you have completed the submitted work entirely yourself. Furthermore, by submitting work, you agree to automated and manual plagiarism checking of all submitted work.

Late submission policy. Late submissions will receive a late penalty of 20% on the score per day late (with a five hour grace period on the first day, e.g., to deal with technical issues) and submissions five days (or more) past the due date are not accepted. In case of technical issues while submitting, contact the instructor *before* the deadline.

Description

A group of friends want to start a website focused on festivals and other events, this similar to how IMDB is a website focused on films. Central in this website will be the events, their details, and user-generated content (e.g., discussions and reviews).

For each event, the website should maintain basic information such that users can search for specific events. For each event, we keep a name, description, start date and time and end date and time, and location (street, number, city, province/state, country). Due to recent experiences, not all events have a location, however: the website will also support virtual events for which a link and instructions are provided to connect (e.g., a link to a streaming service or a registration link for accessing a video conference). Events can be part of a series (e.g., yearly iterations of a festival). For these events, we store the series they belong to and the edition. For example, the *Toronto International Film Festival* is held yearly and the edition of 2024 will be the 49th edition.

Events can have one-or-more activities (e.g., performances on a music festival, screenings on a film festival). For each activity, there is a begin time and date and duration. Optionally, the activity can be tagged with additional location information (e.g., Main Stage for a music festival with concurrent performances; or Room 5 for a film festival held in a cinema with 7 rooms). Per activity, the website can list the participants (e.g., artists). For each such participant, their role is maintained (e.g., performing artist or organizer). Participants can participate in multiple ways on a single event.

Consider an tournament for the utmost competitive game "Minesweeper". This tournament event will be called "Ultimate Minesweeper Competition 2024" and is the 17th edition of this event. The event consists of the following main activities:

1. Before the finale, there are online qualification rounds.

2. Starting Friday May 5th, the main event will start in a massive arena in Ontario. During the main event, there will be a three-day final competition. On Friday, 4 brackets of 4 players will compete to determine the best two players per group that will advance to the quarterfinals. For this day, there will be four activities (one for each bracket). The participants for each activity will be the players of that bracket and the commentators for that bracket.

3. On Saturday, there will be four quarterfinals (8 players, 4 players advance to the semifinals). For this day, there will be four activities (one for each quarterfinals). The participants for each activity will be the two players of that quarterfinal and the commentators for that quarterfinal.

4. On Sunday, there will be three activities: the two semifinals and the finals. The finals will have a halftime show during which famous artist will perform (to further add to the spectacle). The participants for the finals will be the artist, the two finalists, and the commentators for the finals.

Per participant, we maintain the name and a small biography. Given a participant, one should be able to figure out the activities (and the events those activities belong to) that participant partook in.

For user-generated content, the website will keep track of users that have a unique user name, a unique e-mail address, and a password. Users can log in using either their user name or their e-mail address. Users can rate events with a score (between zero and ten). Users can change the rating and the website only keeps track of the last rating provided by the user.

Finally, users can write text contributions. These text contributions are either long-form reviews of events, reactions on other contributions, or public messages users place on their public profile. These text contributions can be searched without knowing the exact type of the contribution (e.g., one can search for any user-generated content containing the word "Minesweeper"). For each text contribution, we store the publication date and the main textual content. In addition, both long-form reviews and public messages have titles and can be placed in user-defined categories (e.g., hobby, work, or 2022). Other users can *like* and *dislike* each text contributions once.

Assignment

The goal of the assignment is to present the above requirements for an information system into an ER (entity-relationship) diagram. To do so, you have to write a report in which you translate the above requirements into an ER (entity-relationship) diagram. Your submission:

1. must include your student number and MacID;

2. must be a PDF file;

3. must *not* be hand-written: prepare your report in LaTeX or in a word processor such as Microsoft Word (that can print or export to PDF);

4. must include an analysis of the requirements of the information system: which parts of the above description are important, which parts did you ignore, which constraints did the requirements provide, which of these constraints did you incorporate in the ER diagram, and which constraints did you exclude (and motivate why they are excluded);

5. must provide a readable and complete presentation of your ER-diagram (that matches your analysis, any discrepancies between your analysis and the resulting ER-diagram should be explained); and

6. must have ER-diagrams that are drawn using software (hand-drawn and scanned submissions will not be graded); big diagrams can be incorporated in the report in several parts (it should be clear how the parts fit together, however).

Submissions that do not follow the above requirements will get a grade of zero.

Grading

While evaluating your work, we will look at:

Completeness. Does your diagram contain all entities, attributes, relationships, and (if possible) constraints described in the description

Correctness. Does your diagram use the correct notation and do you take the right design decisions? Are all included constraints correct? Do all excluded constraints have a proper motivation?

Presentation. Is the diagram and the report readable? Is the report presentable as a stand-alone report to an external party (e.g., the local community and artists that want to start an art library)?

The presented report will account for 10% of the maximum grade; the required entities, attributes, and relationship will account for 60% of the maximum grade; and the required constraints (e.g., keys, relationship participation) will account for 30% of the maximum grade. Every error and inconsistency in your ER-diagram notation will result in a reduction of the overall grade (with the lowest possible grade being zero).

Remarks on drawing ER-diagrams

There are plenty of modeling and drawing programs that support the creation of beautiful ER-diagrams. Examples include Microsoft Visio, Dia, and yEd. Another example is Microsoft PowerPoint (included with your student plan) using the Export to PDF option.

Most programs will use a notation that is slightly different from the textbook and the slides, however. You are allowed to use such a different notation, but if you do so: provide a clear definition of each notation you exactly use (e.g., specify what each type of arrow and shape that you draw means) and stick to a consistent single notation.

The diagrams part of the course slides are drawn directly in LaTeX using TikZ, but we do not recommend that tool without prior LaTeX experience. We have provided some material to get started with LaTeX and TikZ examples on the course website for those interested (under Content > Miscellaneous > Drawing ER Diagrams).