



Assignment 1

ENSF 608 Fall 2021

Department of Electrical and Software Engineering
Schulich School of Engineering

The objective of this assignment is to apply your understanding of entity-relationship and enhanced entity-relationship modelling concepts.

Due: Friday, October 1st, 11:59 PM

Submission: This is an individual assignment. Your submission must be your own original work.

Please upload your solution as a single PDF file to the Assignment 1 Solutions D2L dropbox folder. The file should be named in the following format: Lastname_Firstname_Assignment1.pdf

Your solution may be handwritten or typed, and you may draw your diagram by hand or by using software tools. Handwritten work may be scanned or photographed, but must be legible to be graded.

Weighting: This assignment is out of 25 marks and is worth 10% of your overall grade.

Question Narrative

YYC Connections, a rapidly growing private school for K-6, needs a database to organize their student and staff information. They have provided the following specifications:

“Students are at the core of our school. When a parent first registers their child, we assign the student a unique ID number. We also gather the student’s first name, last name, date of birth (month, day, and year), and their current grade level. For our kindergarten students, we need to track whether they are enrolled in the AM or PM class. For our elementary students (grades 1 through 6), we need to keep track of their division. We offer a lot of volunteer opportunities and field trips that require permission, so parent/guardian information needs to be recorded as well. We store their first name, last name, phone number(s), address, and email address.

Students may have allergies. We keep a record of all allergies and associated treatment protocols. In case of emergencies, we also collect the first name, last name, and phone number of an emergency contact (who might not be their parent or guardian) for all students.

Our students are taught by multi-talented teachers who all teach multiple grade levels. Along with their first names, last names, and preferred prefix (e.g. Ms. vs. Mrs.), we also need to keep track of which grades they are currently teaching and their teaching certificate ID. There are lead teachers for each grade. They manage other teachers to support curriculum development and consistency.

Please let us know if you have any questions about these requirements. We are looking forward to seeing your solution!”

Assignment Questions

Based on the requirements narrative above, design and draw an EER diagram for the described application. Your solution must include the following:


Design Explanation (5 marks)

- Explain your design process and state any assumptions that you have made. What decisions did you make and why? Include the following information:
 - Choose one entity type and describe why its key attribute is unique.
 - Choose one relationship and how it relates the participating entity types.
 - Explain how at least one attribute can be derived from other attributes.

A 5/5 solution will be well-organized, clearly address all the points listed, and outline the main decisions when designing the EER model. The design explanation should be approximately half a page or less in length.

Technical Criteria (20 marks total)

- (16 marks) Your EER diagram must include at least 70% of the following components (i.e. Of the 22 numbered components below, at least 16 different types of components should be identifiable in your model).
 - Entities:
 - 1. Entity Type(s)
 - 2. Weak Entity Type(s)
 - Relationships:
 - 3. Relationship Type(s)
 - 4. Identifying Relationship Type(s)
 - Attributes:
 - 5. Simple Attribute(s)
 - 6. Key Attribute(s)
 - 7. Multivalued Attribute(s)
 - 8. Composite Attribute(s)
 - 9. Derived Attribute(s)
 - 10. Partial Key Attribute(s)
 - Participation Constraints:
 - 11. Total Participation(s)
 - 12. Partial Participation(s)
 - Cardinality Constraints (not Min/Max notation):
 - 13. 1:1 Cardinality(ies)
 - 14. 1:N Cardinality(ies)
 - 15. N:1 Cardinality(ies)
 - 16. M:N Cardinality(ies)
 - Specialization/Generalization (with constraints shown)
 - 17. Disjoint & Total

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- 18. Disjoint & Partial
 - 19. Overlapping & Total
 - 20. Overlapping & Partial
 - Attribute Inheritance
 - 21. Evidence that attributes are inherited, not duplicated
 - Categories (Union Type)
 - 22. Union Type
 - (1 mark) All key attributes must be identified
 - (1 mark) Relationships should be marked with cardinality/participation constraints
 - (1 mark) Specializations and generalizations should be marked with disjoint/overlapping/total/partial constraints
 - (1 mark) Your diagram must be clear, organized, and readable
 - You may add any EER diagram components not listed above

Marks will be distributed as outlined above. Points will be taken off for inaccuracies in translating between the narrative and the EER model.