# COSC 3P32 – Introduction to Database Systems
# Winter 2020
# Group Project, part 1

**Due Date:** March 10th, 2020, noon          **Late Date:** March 13th, 2020, noon
**This work accounts for 5% of your final grade and is worth a total of 50 marks.**

There are 2 parts to this project. In part 1 of the project, you are to revise the design of the Star Wars database already seen in Assignment 1. In part 2, you are to use database tools to build the database, and demonstrate different ways of interacting with the database.

The information to be stored in the database is the same as given in assignment 1, with the following exceptions:

- We wish to add the attribute "main skill" to the Droid table, and every droid of the same type has the same main skill.
- We wish to add the attribute "hyperspace capability" to the Vehicle table; this attribute will be true or false depending on whether the vehicle has hyperspace capability. All vehicles of the same type have the same hyperspace capability.
- Only Jedi/Sith can use lightsabers.
- Only Jedi/Sith can hold a position in the Jedi Council (political unit).
- We wish to know the starting year and final year for the positions held by characters in political units. Obviously, the final year must be no earlier than the starting year.
- Similarly, in any mentorship, the final year must be no earlier than the starting year.

Note that some of the above information will lead to functional dependencies within a table, and must be dealt with in part 1 of the project. Others will require the use of check constraints, triggers or other means, and must be implemented in part 2 of the project. There are also constraint(s) that could not be handled in assignment 1 because you did not have the required knowledge at the time – these also must be handled in part 2 of the project.

**Note:** A sample solution to assignment 1 was emailed to you earlier this term. You can either start this project using that solution, or modify your own solution, as you wish.

For part 1 of your project, you must complete all of the following steps:
1. [5 marks] Provide an ER model for the above database. All attributes of each entity set and relationship set must be shown. All keys must be shown for each entity set. All key and participation constraints must be shown for each relationship set. In addition, write a paragraph specifying any necessary overlap and covering constraints.
2. [5 marks] Based on the ER model, specify a relational schema for the database.
3. [30 marks] For each relation, identify all functional dependencies that hold on the fields of that table. For each table, specify if that table is in BCNF, 3NF or neither. If a table is not in BCNF, then attempt to find a BCNF decomposition that is both lossless-join and dependency-preserving. If this is not possible, then a lossless-join, dependency-preserving 3NF decomposition is acceptable. Clearly specify the resulting relational schema.

4.  [10 marks] Write the SQL statements necessary to create the tables for the above database, capturing as many constraints as possible. Note: the implementation of check constraints, triggers, etc. can be delayed until part 2.

**Submission Requirements:**
1.  You must submit a report containing all of the above information. The cover page of the report must include the names and ID numbers of all members in your group.
2.  The report must be placed in a sealed envelope and submitted in the COSC 3P32 assignment box.
3.  You must attach a group cover page, completely filled out, to the front of the envelope. This cover sheet is available from `http://www.cosc.brocku.ca/forms/teamcover`. Your work will not be marked unless one is submitted *with the report*.