

## CSC2001F, 2020 - ASSIGNMENT 5 – DATABASES

This assignment is to be done in groups of 2 to 5 students – enter the names of your group members on the Vula wiki. **Only 1 member of each group must submit** your work; else we'll mark whichever submission we see first. **Give all group members' student numbers in alphabetical order as the name of your submitted file.** Please use the relevant forum for questions about this assignment, not the chat room/email. **Submit to the AUTOMARKER.**

*Suppose UCT asked you to design a relational database storing as much data about students as possible, to be used in future to detect students who need extra support in 2<sup>nd</sup> year. Naturally you would at the very least store students' school-leaving (SA "matric") and first year results, but you will probably also want to store other information that you believe contributes to how students fare at UCT – here you are limited only by your imagination!*

1. Briefly outline the **additional information** you would store, if any. Generally reasons for including extra information will be obvious, but if you believe any idea of yours is particularly original or obscure, explain briefly why you feel it is relevant. [3]
2. Draw an ER (**entity-relationship**) **model**, using the notation from lectures, for as much of the above information as possible, and at the very least including students' matric & first-year results. Show as much of the semantics (details) as you can in your model. Explain any attribute names that may be unclear. If necessary, motivate any unusual design decisions taken, and/or discuss any shortcomings of your model and why you were unable to remedy these. [6]
3. Give the **relation scheme** derived from your ER model: give each relation name with the names of its attributes in brackets, underlining the attributes of primary keys. [6]
4. Name any ONE **foreign key** attribute (e.g. Table.Colm) [1]
5. Give any ONE non-trivial **functional dependency** that applies to your attributes, and state briefly in simple English what it means. [2]
6. Give any example of an alteration to your database design that would mean it is **not in 2nd normal form**, and state briefly why this is so. [2]
7. Give any example of an alteration to your database design that would mean it is in 2nd normal form but is **not in 3rd normal form**, and state briefly why this is so. [2]
8. Give the SQL statement to create any ONE **view** of your data, and say why it is useful. [2]
9. In 1 line per group member, state the **contribution of that member** (what they did). [1]