Databases 2020/2021

Supervision 2 Questions

1. Discuss the practical exercises in : https://www.cl.cam.ac.uk/teaching/2021/Databases/graph-tick.html

Please include your answer to every question with a short description of the query and your solution

2. Suppose that `a` and `b` are 3-valued expressions in SQL (true, false, or null). Can the expression `(a and b) is null` be rewritten as an equivalent boolean combination of `a`, `b`, `a is null`, and `b is null`?

3. In boolean logic, the expressin `not(a and b)` always has the same value as `(not a) or (not b)`. Is that true in 3-valued logic?

   What about the expression `not(a or b)` and the expression `(not a) and (not b)`?

   Is the expression `a or (not a)` always true in 3-valued logic? If not, can you extend this axiom to make it always true?

4. In SQL, the creator of a database needs to define the *schema* up front: that is, what columns each table is going to have, and the datatype of each column. This means that all rows in the table have the same set of columns (although some of them may be set to `NULL` if the value is unknown).
   On the other hand, Cypher does not have an explicit schema: a node can have any set of properties, and you can always add a property with a new name to an existing node.
   Discuss the pros and cons of these two approaches.

5. We discussed several examples of Cypher queries that have close equivalents in SQL, and some examples that are hard to express in SQL. Discuss: would it make sense to move existing SQL-based applications to Cypher? In what circumstances would you choose one query language over the other?

6. 2008 Paper 6 Question 8 **(b,c)**:

https://www.cl.cam.ac.uk/teaching/exams/pastpapers/y2008p6q8.pdf