# DSE 201 Final - Winter 2018

Good luck!

Problem 1 True or False (no justification required)? User-de ned functions (UDFs) are not allowed in any of your solutions.

1. Consider a schema in which each pair of distinct tables has disjoint column names. Then every SQL query Q with aliases (tuple variables) over this schema can be reformulated to a query Q' without aliases, over the same schema, such that Q' always returns the same answer as Q on every input database.

   FALSE

2. SELECT * FROM T WHERE T.A <= 39 OR T.A > 39
   always returns the same result as SELECT * FROM T.

   FALSE

3. NATURAL LEFT JOIN is SQL-expressible without the JOIN keyword.

   TRUE

4. SELECT DISTINCT T.A FROM T is SQL-expressible without the DISTINCT keyword.

   TRUE

5. SELECT MAX (R.A) FROM R can be expressed without the MAX built-in aggregate, ORDER BY, LIMIT, TOP K, WINDOW and without UDFs.

   TRUE

6. Let R(A,B) and S(B,C) be tables whose underlined attributes are primary keys. Attribute R.B is not null, and it is a foreign key referencing S. SELECT r.A FROM R r, S s WHERE r.B = s.B
   always returns the same answer as SELECT A FROM R.

   TRUE

7. EXCEPT can be expressed in SQL without using the EXCEPT keyword or UDFs.

   TRUE

8. In SQL, all nested queries without correlated variables can be unnested (without creating views or auxiliary tables).

   FALSE

9. Consider tables R(A,B) and S(A,B). Then

   SELECT A FROM (R UNION S)

   always returns the same result as

   (SELECT A FROM R) UNION (SELECT A FROM S).

   FALSE

10. Let R(A,B) be a relation with primary key A and numeric, not-null B. Then SELECT A, MAX(B) FROM R GROUP BY A returns R.

    TRUE