Normalization I

Tom Kelliher, CS 417

1 Administrivia

Outline

1. Vocabulary
2. Normalization practice

Coming Up

Normalization II.

2 Vocabulary

1. A functional dependency is actually a(n) _____ relationship from attribute set A to attribute set B.
   A. one-to-one
   B. recursive
   C. many-to-many
   D. many-to-one
2. Describe three types of anomalies that can result from unnormalized schemas.
3. If X and Y are sets of attributes of relation R, we say that Y is functionally dependent on X if
   A. for each X value there is only one Y value
   B. for each Y value there is only one X value
   C. no two X values have the same Y value
   D. when two rows have the same Y value they also have the same X value
4. In the relational model, every determinant is always
   A. a candidate key
   B. a superkey

C. a composite key
D. none of the above

5. Which of the following is not one of the major objectives of normalization?
   A. removing redundancy
   B. improving efficiency
   C. removing anomalies
   D. increasing model flexibility

6. A relation is first normal form if
   A. every attribute is single-valued for each tuple
   B. the domains of the attributes are atomic
   C. each cell of the table can contain only one value
   D. all of the above

7. A relation is second normal form if it is 1NF and
   A. every attribute is single-valued
   B. every attribute is determined by a portion of the key
   C. every non-key attribute is dependent on the entire key
   D. no non-key attribute determines another

8. In the relation R(A, B, C, D), having the composite key $\{A, B\}$, which of the following FDs would demonstrate that the relation is not 2NF?
   A. $A \rightarrow B$
   B. $A \rightarrow C$
   C. $C \rightarrow D$
   D. any of the above

9. A relation having only one candidate key is third normal form if it is 2NF and
   A. no non-key attribute is determined by only part of the key
   B. no non-key attribute is dependent on another non-key attribute
   C. no part of the key is dependent on another part of the key
   D. there are no partial functional dependencies

10. A relation is Boyce-Codd Normal Form if
    A. every superkey is a candidate key
    B. every determinant is a superkey
    C. every candidate key is a primary key
    D. it has overlapping candidate keys

11. In the relation R(A, B, C, D), having the composite key $\{A, B\}$, which of the following FDs would demonstrate that the relation is not 3NF?
    A. $C \rightarrow \{A, B\}$
    B. $\{A, B\} \rightarrow C$
    C. $C \rightarrow D$
    D. any of the above

12. If a relation is 2NF but not 3NF, it must have which type of functional dependency?
    A. multivalued
    B. partial

C. join
D. transitive

3 Normalization Practice

1. Problem 6.5 in the textbook, parts a–c. (You'll need this for 6.6 later.)
2. Problem 6.1 in the textbook, parts a and b. (You'll need this for parts c and d later.)
3. Problem 6.2 in the textbook, parts a and b. (You'll need this for parts c and d later.)