CS150A Quiz09

FD Properties

I'd like some properties for my functional dependencies please.

1) Select all the FD's that follow from Armstrong's Axioms

Hint: there's at least one

Check all that apply.

- [x] if X → Y and Z → W, then XZ → YW
- [x] if X → Y and WY → Z, then WX → Z
- [ ] if XZ → Y, then X → Y
- [x] if X → YZ, then X → Y
- [x] if X → Y and X → Z, then X → YZ

FD Example

We have a relation R(A, B, C, D, E). We are told that the set of functional dependencies is

F = {E → BD, A → BC, C → DE, D → C}.

Find the attribute closures for each of the attributes. If the attribute closure for X was WXZ, you would fill in "WXZ" without quotes in the answer box.

2) A+:

ABCDE

3) B+:

B

4) C+:

CDEB

5) D+:

DC

6) E+:

EBDC

7) Select the attribute set(s) that are keys for relation R

Hint: there's at least one

Check all that apply.

- [ ] E
- [x] A
- [x] AD
- [ ] BCE
- [x] ABCDE

8) The attribute closure of (BC)+ is equivalent to the attribute closure of (BD)+.

By equivalent we mean the intersection is equivalent to the union of both closure sets.

Mark only one oval.

- ◯ True
- ◉ False

9) Is relation R already in Boyce-Codd Normal Form (BCNF)?

Mark only one oval.

- ◉ Yes
- ◯ No

A superkey

Normalization

BCNF stands for Boyce-Codd Normal Form. For this question, assume the decomposition is performed using the algorithm described in lecture.

10) Decomposing a relation into BCNF does not always guarantee a lossless decomposition.

Mark only one oval.

- ◯ True
- ◉ False

11) Decomposing a relation into BCNF will always guarantee a dependency preserving decomposition.

Mark only one oval.

- ( ) True
- (✓) False

12) Relation R(A, B, C, D, E) is decomposed into R(A, C, D, E) and R(A, B, C) with the set of functional dependencies F = {BC → A, C → D}. Is this decomposition lossless?

Note: the decomposition might not follow the BCNF algorithm discussed in class.

Mark only one oval.

- ( ) Yes
- (✓) No