HW 8

A

Compute the closure of the following set F of functional dependencies for relation schema R=(A,B,C,D,E)

$$A \to BC \quad CD \to E \quad B \to D \quad E \to A$$

List the candidate keys for R. (2 points)

Answer:

the cadidate keys for R is **A, E, CD, BC**

B

Using the functional dependencies of Question A,compute the canonical cover Fc.

Answer:

F_C equals to F , so $F_C = \{A \to BC, \quad CD \to E, \quad B \to D, \quad E \to A\}$

C

Suppose that we decompose the schema R=(A,B,C,D,E) into

$$(A, B, C)\ and\ (A, D, E)$$

Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds:(1 point)

$$A \to BC \quad CD \to E \quad B \to D \quad E \to A$$

Answer:

combine $A \to BC\ and\ B \to D$ as $A \to CD$

combine $A \to CD\ and\ CD \to E$ as $A \to E$

decompose $A \to CD$ into $A \to C\ and\ A \to D$

combine $A \to CD\ and\ CD \to E$ as $A \to E$

combine $A \to BC\ and\ A \to C$ as $A \to BC$

dependency $A \to BC$ can be verified in tabel (A, B, C)

dependency $A \to DE$ can be verified in tabel (A, B, C)

dependency $E \to A$ can be verified in tabel (A, B, C)

so the decomposition of R $(A, B, C)\ and\ (A, D, E)$ is a lossless-join decomposition.