

Database Design Exercise – 2016

1. Design a database for a world-wide package delivery company (e.g., S.F.Express, DHL and so on). The database must be able to keep track of customers (who ship items) and customers (who receive items); some customers may do both. Each package must be identifiable and trackable, so the database must be able to store the current state of the package and its history of sites in its transport path.

Answer requirements:

- 1) Your design should include an E-R diagram
 - 2) Your design should include a set of relational schemas corresponding to E-R diagram provided by you above with a list of constraints, including primary-key and foreign-key constraints.
 - 3) For each relational schema designed by you, claim which normal form the relational schema is in and describe the evidences.
2. Compute the closure of the following set F of functional dependencies for relation schema R= (A, B, C, D, E).
 - $A \rightarrow BC$
 - $CD \rightarrow E$
 - $B \rightarrow D$
 - $E \rightarrow A$

Answer Requirement:

- 1) List FDs(functional dependencies) with A, E, or CD on the left hand side of the arrow.
Note: the right hand side of the arrow should be the union of all attributes functional determined by the left hand side of the arrow
- 2) List the candidate keys for R.