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CMPT 308

3/27/2016
Section 111

Lab 007 – Normalization One

Part One

1. My reply: “This is a good start, but it needs some improvement so that we will be able get more information from the database and keep the information consistent.”

2. Table in first normal form:

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	*32808*	09-13-2005	754.95
DB32	*32808*	12-03-2005	380.00
DB32	*37691*	06-15-2005	380.00
DB33	*57772*	05-27-2005	412.77
WP08	*32808*	01-12-2006	185.00
WP08	*37691*	06-15-2005	227.50
WP08	*57222*	05-27-2005	170.24
WP09	*59836*	10-30-2005	35.00
WP09	*77740*	05-27-2005	35.00

3. The primary key is a composite key of the `PackageID` and `TagNumber` columns.

Part Two

4. Table with two more columns:

PackageID	TagNumber	ComputerModel	PackageName	InstallDate	SoftwareCostUSD
AC01	*32808*	Lenovo	Lotus Notes	09-13-2005	754.95
DB32	*32808*	Dell	Oracle DB	12-03-2005	380.00
DB32	*37691*	Dell	Oracle DB	06-15-2005	380.00
DB33	*57772*	Dell	SQL Server	05-27-2005	412.77
WP08	*32808*	Lenovo	MS Office	01-12-2006	185.00
WP08	*37691*	Lenovo	MS Office	06-15-2005	227.50
WP08	*57222*	Lenovo	MS Office	05-27-2005	170.24
WP09	*59836*	Apple	MS Word	10-30-2005	35.00
WP09	*77740*	Apple	MS Word	05-27-2005	35.00

5. Functional dependencies:
   a. (`PackageID`, `TagNumber`) → `InstallDate`
   b. (`PackageID`, `TagNumber`) → `SoftwareCostUSD`
   c. `PackageID` → `PackageName`
   d. `TagNumber` → `ComputerModel`

6. This table is not in third normal form because it is not in second normal form, since we have partial dependencies on the primary key, as shown above.

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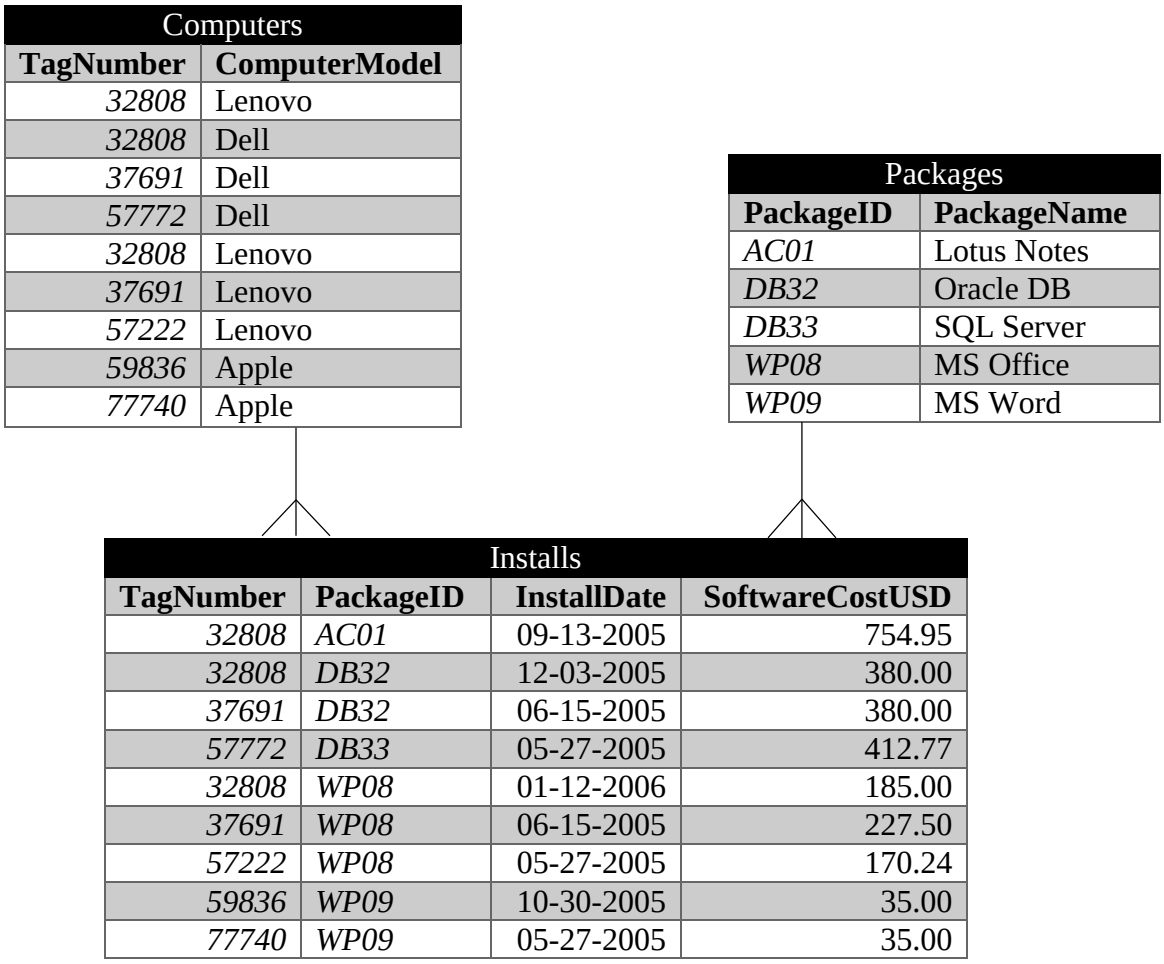
Part Three

7. Determinants/primary keys for all tables:
    a. `Computers` table: `TagNumber`
    b. `Installs` table: (`TagNumber, PackageID`)
    c. `Packages` table: `PackageID`

8. Functional dependencies for all tables:
    a. `Computers` table: `TagNumber` → `ComputerModel`
    b. `Installs` table:
        i. (`TagNumber, PackageID`) → `InstallDate`
        ii. (`TagNumber, PackageID`) → `SoftwareCostUSD`
    c. `Packages` table: `PackageID` → `PackageName`

9. The new tables are in first normal form, and there are no partial dependencies, so it is in second normal form, and the tables have no multiple dependencies, so it is in third normal form as well. This table is in Boyce-Codd normal form as well, since there are no transitive interior dependencies (foreign keys in the same table).

10. Entity relationship (E/R) diagram:



Computers

TagNumber	ComputerModel
32808	Lenovo
32808	Dell
37691	Dell
57772	Dell
32808	Lenovo
37691	Lenovo
57222	Lenovo
59836	Apple
77740	Apple

Packages

PackageID	PackageName
AC01	Lotus Notes
DB32	Oracle DB
DB33	SQL Server
WP08	MS Office
WP09	MS Word

Installs

TagNumber	PackageID	InstallDate	SoftwareCostUSD
32808	*AC01*	09-13-2005	754.95
32808	*DB32*	12-03-2005	380.00
37691	*DB32*	06-15-2005	380.00
57772	*DB33*	05-27-2005	412.77
32808	*WP08*	01-12-2006	185.00
37691	*WP08*	06-15-2005	227.50
57222	*WP08*	05-27-2005	170.24
59836	*WP09*	10-30-2005	35.00
77740	*WP09*	05-27-2005	35.00