

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, SoftwareCostUSD
 - b. PackageID → PackageName
 - c. 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.

Part Three

7. Determinants/primary keys for all tables:

- Computers table: TagNumber
- Installs table: (TagNumber, PackageID)
- Packages table: PackageID

8. Functional dependencies for all tables:

- Computers table: TagNumber \rightarrow ComputerModel
- Installs table: (PackageID, TagNumber) \rightarrow InstallDate, SoftwareCostUSD
- Packages table: PackageID \rightarrow 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:

