Brenden Bishop
Database Systems
Normalization HW #1

Part I:

I would say that the data integrity is not preserved and the data is not in first normal form and as a result can cause the data to be misinterpreted or lost. The database needs to be atomic and currently it is not. There are duplicate data in the same rows, and it needs to be restructured.

This would be the data in first normal form:

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	9/13/05	754.95
DB32	32808	12/3/05	380
DB32	37691	6/15/05	380
DB33	57772	5/27/05	412.77
WP08	32808	1/12/06	185
WP08	37691	6/15/05	227
WP08	57772	5/27/05	170.24
WP09	59836	10/30/05	35
WP09	77740	5/27/05	35

The primary key is a combination of the PackageID and the TagNumber.

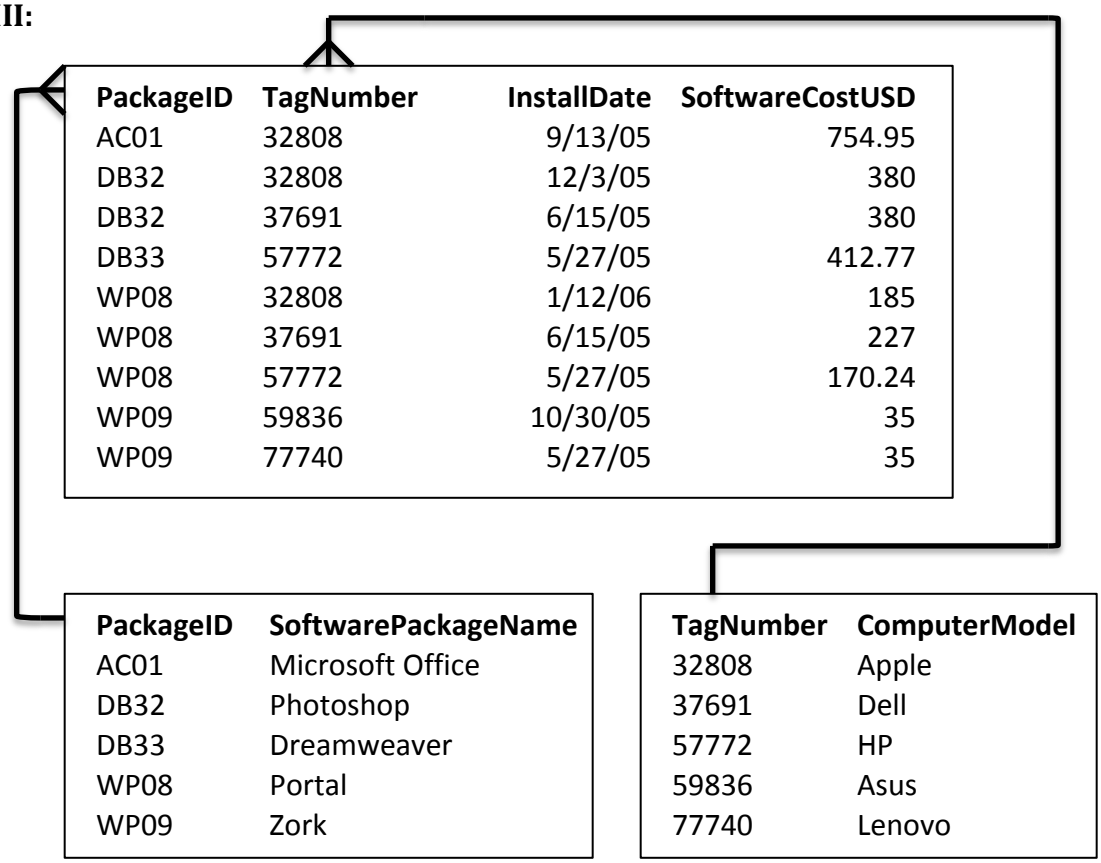
Part II:

PackageID	TagNumber	SoftwarePackageName	ComputerModel	InstallDate	SoftwareCostUSD
AC01	32808	Microsoft Office	Apple	9/13/05	754.95
DB32	32808	Photoshop	Apple	12/3/05	380
DB32	37691	Photoshop	Dell	6/15/05	380
DB33	57772	Dreamweaver	HP	5/27/05	412.77
WP08	32808	Portal	Apple	1/12/06	185
WP08	37691	Portal	Dell	6/15/05	227
WP08	57772	Portal	HP	5/27/05	170.24
WP09	59836	Zork	Asus	10/30/05	35
WP09	77740	Zork	Lenovo	5/27/05	35

Functional Dependencies:
PackageID → SoftwarePackageName;
TagNumber → ComputerModel;
(PackageID, TagNumber) → SoftwareCostUSD;
(PackageID, TagNumber) → InstallDate;

This table is not in 3rd normal form because it is not in 2nd normal form. There are subsets of data that apply to multiple rows in the same table that should be separated into multiple tables. Also, there are columns that are not solely dependent on the primary key. For example, the SoftwarePackageName is only dependent on the PackageID, and not dependent on the primary composite key of (PackageID, TagNumber).

Part III:



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PackageID	SoftwarePackageName
AC01	Microsoft Office
DB32	Photoshop
DB33	Dreamweaver
WP08	Portal
WP09	Zork

TagNumber	ComputerModel
32808	Apple
37691	Dell
57772	HP
59836	Asus
77740	Lenovo

Primary Keys:
Table 1: (PackageID, TagNumber)

Table 2: PackageID

Table 3: TagNumber

Functional Dependencies:
Table 1:(PackageID, TagNumber) → InstallDate
(PackageID, TagNumber) → SoftwareCostUSD

Table 2: PackageID → SoftwarePackageName

Table 3: TagNumber → ComputerModel

These new tables are in 3rd normal form because the tables are atomic and have a primary key, so it is in 1st normal form. Also the columns in all of the tables are fully dependent on their primary keys, so it is in 2nd normal form. And finally since it has fulfilled 1st and 2nd normal forms and all of the attributes that are not dependent on the primary keys are removed from that table.